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MEDICAL NEWS

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Original Communications

OPHIDISMUS OR SNAKE POISONING. *

By C. C. McCulloch, Jr., M. D., U. S. A.,

Washington, D. C.,

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The subject of snake bites and their treatment has apparently not been recently referred to in a practical way in the journal literature. Inquiries about it, however, often come to the medical library. I have concluded, therefore, that a brief account of the matter, not aiming in any way at completeness, but merely presenting a short résumé of modern views, may not be unacceptable at the present time.

The snakes belong to the order Ophidia of the Reptilia, and poisonous snakes are of two kinds, Colubrine and Viperine. The Colubrine group includes, among others, the Elaps or coralline snakes and the cobras (genus *Naja*); and the Viperine group, the common rattlesnake (*Crotalus*), the ground rattlesnake (*Sistrurus*), the water moccasins and the copperhead snakes of terrestrial habits (*Ancistrodon*). All of these except the cobra are found in the United States. The last three genera mentioned all belong to the family Crotalidae. These have erectile poison fangs in front, few or no teeth in the upper jaw, and a deep pit between the eye and the nostril. In the genus *Crotalus* the tail ends in a well developed "rattle," and the upper surface of the head is covered with small granular scales or plates, with a very few larger plates in front of the eyes. The commonest rattlesnake of America, the *Crotalus adamanteus*, has, on a sort of olive gray ground, a beautiful diamond shaped ornamentation of the body scales. This species is found in the South and west to the Mississippi River. The ornamentation of the *Crotalus atrox* (Fig. 1) or Texas rattlesnake, whose habitat is the arid regions of the Southwest, is composed of conspicuous hexagonal rings. Other well known varieties are the prairie rattlesnake, or *Crotalus confluentus*, of the region from the Missouri River to the Rocky Mountains, the *Crotalus oregonus* of the Pacific coast, and the *Crotalus cerastes* or horned rattlesnake of Arizona and nearby regions. The *Crotalus horridus*, or banded or timber rattlesnake, of a sulphur yellow color with dark cross bands, inhabits the coastal regions from Vermont to Florida, is common in

the Alleghany Mountains, and is found west as far as Iowa, Kansas, and Texas. Of the so called ground rattlesnake, pigmy rattlesnake, or *Massasauga*, generically known as *Caudisona*, or more correctly *Sistrurus*, one variety is found in the Gulf region of the coast and along the lower Mississippi and another in the North as far as New York, Michigan, and Iowa. Ground rattlers are smaller and therefore not so dangerous as the other varieties. In *Caudisona* the head shows nine large plates and the tail shows a rattle, smaller but similar to that of *Crotalus*. There are other rattlesnakes in the United States, but those mentioned comprise the common varieties.

Snakes of the genus *Ancistrodon* have no rattle on the tail, though the copperhead shows a sort of tail cap (Fig. 6). They have, like *Elaps sistrura*, and most of the nonvenomous snakes, nine large head plates. They have elliptical pupils, thus differing from the harmless snakes in which the pupil is round. The water moccasin, or *Ancistrodon piscivorus*, has the inside of the mouth of a distinct white color, hence is often known as the cotton-mouth snake (Fig. 2). Its home is in the South, reaching as far west as Texas. The copperhead, or *Ancistrodon contortrix*, also known as the highland moccasin (Fig. 3), has a wider range, extending from Massachusetts to Texas. *Elaps* is the only Colubrine genus found in the United States. It is quite different from the Viperines. The body is slender and cylindrical instead of thick and stumpy and it is not over four feet in length. Instead of the body being separated from the head by a narrow neck, as in the Crotalidae, these are continuous. There is no anteorbital pit and the fangs are permanently erect. There is no rattle. The color scheme is usually red and black bands separated by narrow yellow rings and they resemble closely certain nonpoisonous snakes (Fig. 4). This is the so called "harlequin" or "coral" snake of the southeastern United States (1). In *Elaps* the black rings are bordered on each side by the yellow ones, whereas in harmless snakes, the yellow rings are bordered on each side by the black. Again, in *Elaps* the bands completely encircle the body; in several nonvenomous imitators the abdomen is white or blotched.

In India some 20,000 deaths are said to occur annually from snakebite. The principal snake there is the cobra di capello or *Naja tripudians*. It has

*Read before the Section in Sanitary Science of the Southern Homeopathic Medical Association at Washington, D. C., November 15, 1917.

a dilatable hood which it expands when biting and unlike the rattlesnake the body is not coiled. The *Vipera russellii* is very common in India, also the krait, a very poisonous Colubrine. The former belongs to the Viperines but not to the Crotalidae and

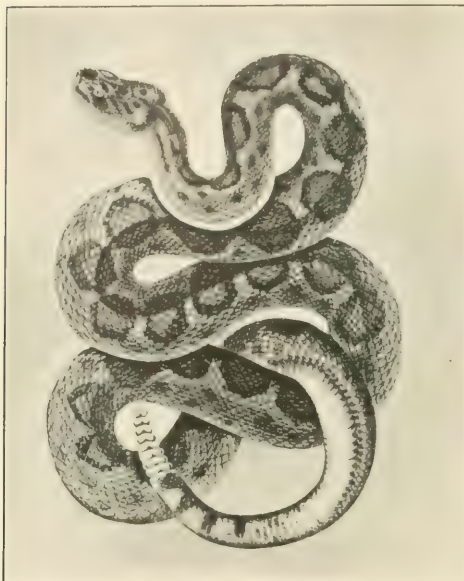


FIG. 1.—*Crotalus atrox*, the Texas rattlesnake. (After Baird.)

has no pit. Elaps is also found in India and the related genus *Ophiophagus*, or king cobra, which is the only snake known that is said actually to pursue man. There are certain venomous sea snakes, hydrophids with laterally compressed tails, found in the Indian and Pacific oceans from Panama to Madagascar. The puff adder, *Crotho*, a viper, is a very poisonous snake, common in Africa. Cleopatra's snake was a small cobra. The dreaded *fer de lance* of the West Indies is a variety of copperhead snake. The islands of Cuba and Porto Rico are, like Ireland, free from snakes. In the Philippine Islands snake bites are rare but poisonous species do exist. The hooded cobra has been found there, but the one most feared by the natives is the rice snake, *Dryaphis prasinus*, a poisonous Colubrine, the *dahun palay* of the native dialect. This is of a bright green color and extremely slender. Most of the tropical islands are inhabited by deadly Elaps. Large rattlesnakes are very common in Central America. The "bush-master," *Lachesis mutus*, of tropical South America is one of the pit vipers. Instead of a rattle it has a horny spine at the end of the tail.

The venom of poisonous snakes is injected

through the tubular fang which communicates by a duct with a secretory poison gland situated within the muscles on each side of the head. The color of the venom varies from light amber to yellow. At rest the fangs are turned back along the roof of the mouth. When the snake strikes, the points come forward (Fig. 5). The venoms of the different snakes vary greatly in their poisonous properties. They may act on the nervous system, neurotoxins, on the blood corpuscles, hemolysins and hemagglutinins, or on the endothelium of the blood-vessels causing hemorrhages, hemorrhagin. These toxins are combined in different degrees in the various venoms. The neurotoxin causes death by paralyzing the respiratory and cardiac centres. In a general way we may say that cobra venom is mainly neurotoxic and hemolytic, rattlesnake poison chiefly hemorrhagic in nature. Calmette's antivenin is a serum obtained by immunizing horses with a mixture of eighty per cent. cobra and twenty per cent. viperine venom. This is said to have little influence on the rattlesnake venom and Noguchi has therefore prepared a rattlesnake antivenin along similar lines. He has also a moccasin antivenin. The venoms are attenuated by weak acids before injection into the horse (2). Snake bites are most common on the extremities for obvious reasons, and more frequent in men because they are the more exposed.

The symptoms of Colubrine poisoning, as, e. g., by the Indian cobra, are local pain, beginning at the site of the bite which usually appears as two small punctures about three fourths of an inch apart, later increasing and spreading up the extremity. There is perhaps some swelling, though local symptoms are not pronounced. In about thirty minutes a feeling of vertigo or intoxication comes on, and there is rapid loss of voluntary control, resulting in fact in a sort of paralysis of the muscles of the leg and other muscles, including those of the jaw. There is generally profuse salivation. Dilated pupils are common. Owing to the local paralysis the patient cannot speak or swallow. There may be mental hebetude and one should be careful not to confuse



FIG. 2.—*Ancistrodon piscivorus*, the water moccasin or cottonmouth. (After Stejneger.)

the symptoms with those of alcoholism. Respiration gradually becomes slower, until death occurs, usually by failure of respiration before the heart fails. Death occurs within fifteen hours; in one third of the cases, within three hours. In cases that recover the serious symptoms abate and local swelling occurs about the bite. There may be slight

fever and passage of large quantity of urine.

In the Viperine type, as the American rattlesnake, there is local pain in the bite, and swelling and hemorrhagic discoloration of the part. There may be hemorrhage from the wound. The pain and swelling steadily increase. In bad cases, where life

blow may produce merely a scratch. If there is any further doubt, the onset of symptoms will quickly dispel it. The mortality from snake bite is said to be in India about thirty-five per cent., in the United States ten per cent. The mortality from copperhead bites is only about one per cent., and

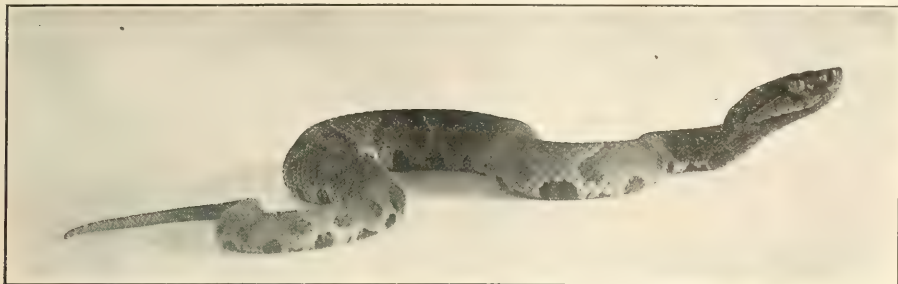


FIG. 3.—*Anistrodon contortrix*, the copperhead. (After Shufeldt.)

is prolonged for a sufficient time, vesication, sloughing and gangrene, and death from general blood poisoning may result. Within about fifteen minutes usually after the bite, constitutional symptoms set in. There are a feeling of faintness, prostration, inability to stand, nausea, vomiting, and a cold sweat. The pulse is rapid and feeble, and the blood pressure falls rapidly. The mind is generally clear, the expression anxious. Death may ensue in this stage from vasomotor depression and circulatory failure. Recovery, when it occurs, sets in very suddenly, and may take place even in the most desperate cases.

The diagnosis of snake poisoning is usually easy. Two points are to be decided: whether the snake in question is a poisonous one and whether the patient has actually been bitten. How shall we easily and quickly determine whether the snake is venomous? 1. Nonpoisonous snakes do not have fangs. The poisonous varieties have two hollow fangs and, it may be, several reserve fangs, in the anterior part of the upper jaw. 2. All venomous snakes of the United States, except Elaps, have the pit above referred to, a small fossa situated between and below the eye and nostril (Fig. 5). 3. All poisonous snakes of the United States have rattles or show, on the ventral surface of the tail, at least some of the scales undivided in the median line (Fig. 6). 4. All except Elaps cause marked local swelling and extravasation. Elaps gives different symptoms as above noted. 5. The Colubrine, Elaps, is found only in the South and has the conspicuous peculiarities of shape and color outlined above. Certain harmless snakes closely imitate this coloring, but may be differentiated by their lack of fangs. The patient, if bitten, usually shows the fang marks, or venom on the surface at the locality of the bite. The nonpoisonous snake has four rows of teeth in the upper jaw, and the pattern often shows on the skin; in the poisonous snakes, the two outer rows are replaced by more distinctly marked punctured wounds, or fang marks (Fig. 7). It is possible, of course, that only one fang may hit, or a slanting

that from moccasin bites not high, though both these snakes are much more aggressive and vicious than the rattlesnake.

The most important point about the treatment of snake poisoning is that it should be prompt; owing to the fact that constitutional symptoms come on quickly, there is no time to lose. The indications as to local treatment are, 1, that the passage of the virus into the general circulation should be prevented or hindered as far as possible; 2, the venom should be neutralized at its point of entry into the body. The first indication is carried out by the

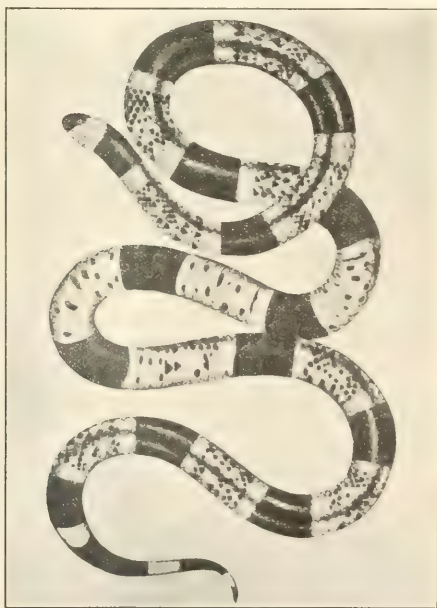


FIG. 4.—*Elaps fuleis*, the harlequin snake. (After Baird.)

immediate application of a tourniquet or tight ligature to the limb, proximal to the site of the bite, free incision along the course of the venous and lymphatic return, and dissection around the punctures to encourage bleeding and the mechanical washing out of the virus, followed by cauterization of the puncture holes made by the fangs of the snake. The actual cautery may be used or some chemical caustic. A popular method of cauterization used on the Western plains and one perhaps quite efficacious is to place some grains of gunpowder on the wound and set fire to it. Sucking the wound by the mouth may be tried, though this

The measure that has generally been considered most desirable in regard to the second indication is the free use locally of permanganate of potash. The wound is swabbed out with a strong, three per cent., solution of permanganate of potash, or is packed with the crystals which are well rubbed in. When there is no other solvent at hand, saliva may be used. Wellman injects weak permanganate solution into the tissues about the wound. Lauder Brunton has devised for popular use in India a cheap snake bite outfit containing a lancet and permanganate crystals (Fig. 8). Rogers thinks very favorably of the permanganate treatment. If possible it should be used within five minutes of the time of the bite. Stimulants are indicated internally for syncope, but the common use by the laity of immense amounts of whiskey is said to do much more harm than good from the overdosing. Ammonia and especially strychnine are better remedies for this purpose. Artificial respiration may be of advantage when the respiratory system is failing. Rest and warmth are of value in the treatment. It has been suggested on theoretical grounds that hypodermic injections of ten minims of a 1:1,000 solution of

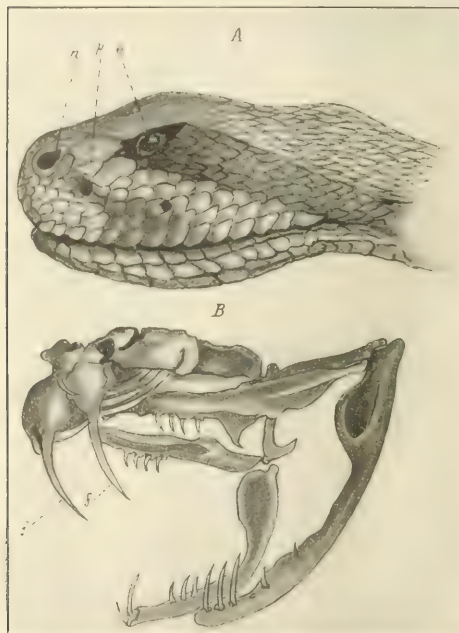


FIG. 5.—Drawing showing A, location of the pit with reference to eye and nostril in the rattlesnake's head; B, skull of rattlesnake, showing fangs. (R. W. Shufeldt, 1917.)

procedure is probably dangerous, if there are any abrasions present, and is not really thought by the best authorities to have any efficacy.

Some use two ligatures on the limb, one a good deal higher than the other. The ligature, to be most surely effective, should be applied over those portions of the limb containing one bone. If no rubber bandage is at hand, a part of the clothing twisted with a stick can be made to serve the purpose of a tourniquet. Sir Joseph Fayer says to twist the ligature "without mercy" but on account of the danger of gangrene not to keep it on longer than necessary, say one half hour, to accomplish thoroughly the next step in the treatment. The knife should be freely used, incising the fang punctures freely and widely. Make long and deep cuts, lay the wound well open, dissect freely about the punctures, and let the blood flow away. This is vital.

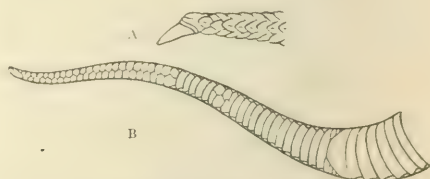


FIG. 6.—A, the tail end of the copperhead. (After Garman.) B, the under side of the tail of the water moccasin; note the undivided scales. (After Stejneger.)

adrenalin are good, for stimulation of the vaso-motor centre in cases where it is depressed. Lauder Brunton has, also from theoretical considerations, suggested the use of nicotine. Bandages to the legs may help in keeping up the circulation. In the case of viperine bites, surgical precautions should be later taken against the advent of septicemia from sloughing.

The latest Indian authorities, after much experimentation, advise that a better local application than the permanganate is chloride of gold. About ten c. c. of a five per cent. solution of this salt is injected hypodermically, in an endeavor to impregnate the whole area about the bite, in connection of course with the other measures we have discussed. Two per cent. solution of chloride of lime may be used in the absence of the other remedies. Local measures to be effective must be applied soon after the bite; some hours later they are of course wholly useless. Possibly, the washing out of the stomach may help in the elimination of the poison. The Hopis and other Indians of the Southwest, who practise the ceremonial snake dance, use emetic remedies in case of a performer being bitten. Mental encouragement of the victim, who is usually much depressed in spirits, may have some value.

I have not yet mentioned the use of the comparatively recently discovered 'specific' remedy, antivenin. It goes without saying that this is of vital importance and comprises the only really

scientific treatment. Reported results, while not as perfect as we would wish, are still highly encouraging. If used early enough and in sufficient quantities, fatal results should be very rare. It should be used as soon as possible after the bite is received, intravenously and in a dose of 100 c. c., repeated every fifteen minutes so long as the symptoms show a "crescendo" movement. Noguchi strongly ad-

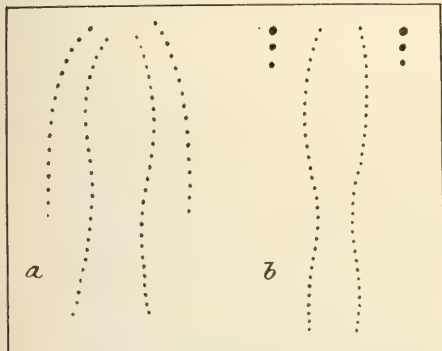


FIG. 7.—Diagram of tooth marks of, a, a nonpoisonous snake; b, a poisonous snake. (After Shufeldt.)

vocates the intramuscular injection of a similar amount locally, more distant from the wound than the drugs, to avoid chemical neutralization. The latest evidence seems to show that Calmette's antivenin is ineffective against the rattlesnake bite, so one should also have Noguchi's serum at hand in places where one is likely to be bitten by a snake. Calmette says that his venom will be effective if used within two hours of the time of the bite. If kept cool and away from the light, the serum will probably retain its strength for about a year.

Methods of prophylaxis used in snake infested localities are the giving of rewards to encourage snake killing, the general cultivation of land, and the keeping of animals, such as the mongoose, which are destructive to snakes. One should avoid sleeping on the ground and keep grass and jungle land cut down in the vicinity of human habitations. Crude carbolic acid painted around the foundation posts of houses is said to keep out snakes. Gratings in bathrooms should be covered. Boots or

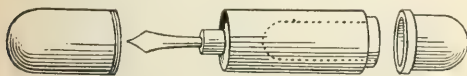


FIG. 8.—Sir Lauder Brunton's pocket device for treating snake bite. Permanganate crystals are carried in the cavity at the end.

puttees should be worn in walking over ground possibly infested with snakes; a lantern should be carried at night, and it is a wise precaution to carry a Brunton outfit in one's pocket. It is important not to lose one's presence of mind when in danger of being bitten; it is said that throwing down the hat or some maneuver of that sort will often divert the snake's attention and enable one to escape. Most important of all is to have at hand antivenin, the only really specific remedy, when it is needed. In practice, as occasion usually comes now in

America, we do not so have it. Owing to the expense and rarity of the need for its employment, it is hardly practicable for the individual physician to keep on hand a satisfactory fresh supply of the remedy.

However, it seems to me that each board of health or county medical society, and every military or other camp in the country where snake bites might occur, should procure and keep on hand at all times a small supply both of Calmette's antivenin for Elaps and of the Rockefeller Institute antirattlesnake and antimoccasin serums. The latter may also be used for copperhead bites. These should, as stated above, be kept cool and in the dark, as otherwise they deteriorate quickly, and be renewed from time to time, so as to have really active preparations on hand when needed. Modern motor transportation is so widespread, even universal, that it ought not to be difficult, certainly not impossible, to obtain the remedy, when needed, from its place of deposit in a short time.

There is one doubtfully poisonous reptile known, not belonging to the snakes, and this is the so called Gila monster, the *Heloderma suspectum*, found in Arizona and New Mexico. This is a big lizard, nearly two feet long. Its bite is probably rare, but grave symptoms are said to have followed it. There is drowsiness, paralysis, and failure of heart and respiration. The local treatment is the same as in snake bite, and owing to the general similarity of the symptoms to those produced by the the Colubrine snakes, Calmette's antivenin might be tried. Certain scorpions and tarantulas of the class of Arachnida and centipedes of the class Chilopoda, which are very common in the tropics, may produce a certain amount of local irritation and slight constitutional disturbance. The popular notion that they produce fatal symptoms is a mistake, except perhaps in very young children. The treatment is the use of ammonia locally, followed by soothing applications. Stimulants internally may occasionally be necessary.

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Ionic Medication.—Leighton Kesteven (*British Medical Journal*, September 29, 1917) makes a strong plea for the more frequent use of ionization in the treatment of various conditions, mainly infections and benign neoplasms. He describes several different methods of application and a number of solutions which should be used for different purposes. Among the conditions which can be favorably influenced or cured by this form of treatment are the various forms of otitis, many cases of mastoiditis, some forms of labyrinthine disease, simple hyperplastic goitre, acute and chronic tonsillitis, enlargement of the turbinates, enlarged prostate, etc. The secret of success in the use of ionization lies in the proper selection of the solution, the proper technic of application, and due perseverance in some of the conditions which may not be influenced at all for several weeks and which may yet respond very well if the treatment is continued.

THREE UNUSUAL CASES OF RENAL TUBERCULOSIS*

By LEO BURGER, M. D.,
New York.

In the diagnosis of tuberculosis of the urinary tract, the urologist or surgeon is frequently confronted with difficulties of two kinds—those pre-

the right kidney. A diagnosis of right renal and vesical tuberculosis was made.

On August 4, 1917, I did a typical nephrectomy, the following interesting lesions being encountered: The kidney was but slightly adherent, fairly movable, about normal in size, with no gross evidences of tuberculous involvement. The ureter was therefore palpated and was found densely adherent to the posterior parietes and surrounded by a mass of connective tissue, so firm in consistency that it appeared to be almost impossible of removal. With some difficulty, a ureter as thick as a man's little finger was freed for a distance of about six inches, ligated and cut through, and the kidney then removed.

It is to the picture of this specimen of kidney pelvis and ureter, with its seemingly normal parenchyma and its apparently extensive involvement of the pelvis of the kidney and ureter, that I wish to direct attention (Fig. 1). This demonstrates beautifully the difficulty of macroscopic recognition of the lesions of renal tuberculosis.

On bisection of the kidney, the only striking lesion that could be viewed with the naked eye was an intense inflammatory process involving the pelvis of the kidney and calyces, by virtue of which the pelvis was thickened to about three times the normal, its surface granular as if covered by a multitude of miliary tubercles, moderately reddened, but nowhere showing the lesions of tuberculosis, the small granules appearing much larger than those characteristic of miliary tuberculosis. No miliary tubercles could be seen in the parenchyma, nor were there any gross ulcerations of the apices of the papillae. In short, macroscopically we had an apparently normal kidney with a very much thickened, inflamed, and indurated pelvis, and an enormously thickened ureter which, in a limited number of sections, showed nothing absolutely characteristic of tuberculosis.

It was not until a number of sections had been made through some of the hidden portions of the calyces, which had not appeared on bisection of the organ, that typical

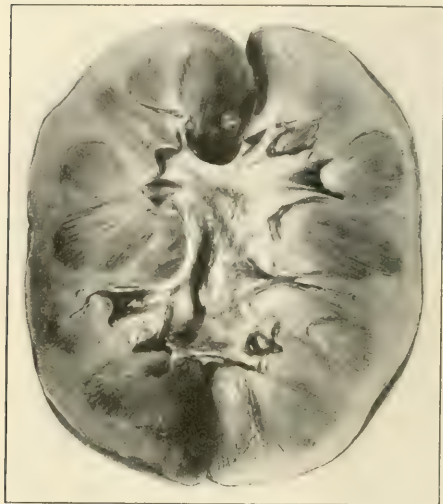


FIG. 1. Apparently intact kidney with no gross surface lesions suggestive of tuberculosis, harboring small lesions in the calyces, and showing a thickened granular pelvis.

sending themselves before operation at the time of cystoscopy, and that of recognizing renal tuberculous lesions at the operating table when the suspected kidney is brought to view. The difficulties that the cystoscopist encounters have been frequently described; also the problems due to the possibility of contamination of the ureteral specimens, as well as the possibility of a secondary extension of tuberculous lesions into the bladder from other organs. I do not care to dwell on them here. It is rather that phase of the problem which the surgeon meets at the operating table that I wish to discuss. The three cases I shall here describe are interesting because they emphasize how difficult it is to recognize a tuberculous lesion in a kidney, even when the kidney is bisected, and practically the whole of its pelvis brought into view.

CASE I. N. S., thirty-eight years old, male, was admitted to the Surgical Service of the Mount Sinai Hospital under my care in July, 1917, with the usual symptoms characteristic of tuberculosis of the kidney and bladder, namely, frequency of urination, burning on urination, nocturia lasting for about six months, and the passage of cloudy, purulent urine containing tubercle bacilli. On cystoscopic examination, July 30, 1917, I found the usual lesions of tuberculosis in the bladder, polypoid edema about the right ureter, and slight retraction in this region. Both kidneys functioned well, as evidenced by the output of indigo carmine, and a small number of white blood cells were found in the specimens obtained from both kidneys, but tubercle bacilli were found only in the specimens from



FIG. 2. Thickness of mucosa of a calyx, the only tuberculous lesion found.

*Read before the Section in Gastrointestinal Surgery, New York Academy of Medicine, October 1917.

cheesy ulcerative lesions of tuberculosis were found. These involved a calyx, without, however, showing any true milium tubercles (Fig. 2).

These cheesy lesions I regard as absolutely characteristic of tuberculosis, when they are present in the kidney calyces, pelvis, or ureter, and the diagnosis may be made even without the finding of endotheloid and giant cells. The photomicrograph represented in Fig. 2 shows a section through such a necrotic calyx. Above and on the left the mucous membrane is seen to be replaced by a zone of coagulation necrosis. The submucous connective tissue is markedly thickened by virtue of connective tissue proliferation and there are the cellular evidences of a chronic pro-



FIG. 3.—Tuberculous kidney with ulcer in the pelvis; externally an apparently normal organ.

ductive inflammatory process.

Summary.—In a case of frank vesical tuberculosis, with tubercle bacilli in the urine, and with typical lesions about the right ureteral orifice, we removed an enormously thickened ureter, doubtlessly tuberculous, and a kidney with minimal changes, changes insufficient for recognition by the surgeon at the operating table, and requiring thorough investi-

gation on the part of the pathologist for their detection.

Several years ago I reported and described two specimens of kidneys, in one of which a minute cheesy lesion in one of the calyces was the only evidence of tuberculosis that could be found, although tubercle bacilli and pus were present in the urine. In the other case a minute ulcerative lesion of the pelvis, with some peripelvic chronic connective

my own preconceived notion that in most cases the papillae are the first portions of the organ to be attacked.

The following description of my specimens will explain why the old theories may need revision:

CASE II.—The kidney specimen (Fig. 3) from M. S., April 15, 1908, was about normal in size, the capsule stripped off easily and presented no evidence of renal tuberculosis on the surface, nor did the outer surface, when the organ was bisected by vertical section, show any sign of tuberculous tissue in the renal parenchyma. Near one of the papillae of the upper pole and involving one of the recesses of the calyx, as well as the mucous membrane of the calyx over an area about one centimetre in length and six millimetres in width, there was considerable thickening of the mucous membrane of the calyx, together with several nodular protrusions (Fig. 3). About one centimetre away from the aforementioned papilla there was an irregularly oval ulcer measuring eight millimetres by five millimetres, of very shallow depth, with a margin of irregular contour and slightly hemorrhagic base. Elsewhere, the pelvis seemed to be practically normal, except at one point nearer the ureteral junction, where a thickening of the ureter

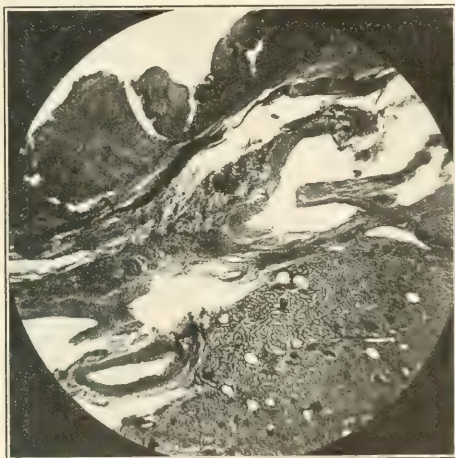


FIG. 4.—Coagulation necrosis of mucous membrane of a calyx seen above in photomicrograph taken from Case III.

similar to that above described, seemed to include also the peripelvic fat. In this region the pelvis and peripelvic fat showed considerable induration, although the mucous membrane of the pelvis was perfectly intact. Nowhere else in the kidney could any evidence of tuberculous disease be detected.

Histological examination of the pelvic tissue revealed two lesions—an advanced tuberculous infiltration with cheesy degeneration and ulceration, and earlier stages in which there were solitary and agminated tubercles. In the specimens from the thickened and ulcerated portion of the pelvis, near the ureteropelvic junction, there was a combination of milium tubercles and coagulation necrosis. The oval ulcer illustrated in the figure was here present. In the renal parenchyma there were absolutely no evidences of a tuberculous process anywhere, nor were any of the papillae affected.

In short, we are dealing here with early lesions of tuberculosis in the pelvis of a kidney in which there are no signs of involvement of the parenchyma, and the dissemination of the process has taken place by way of the pelvic mucosa rather than upward into the cortex or pyramids.

CASE III.—The kidney specimen (Fig. 4) from L. S.,

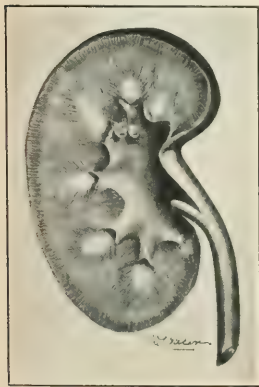


FIG. 4.—Tuberculous kidney with minimal lesions of calyx and adjoining papilla; externally apparently normal.

tissue infiltration, was the only lesion present, showing on section typical tuberculous milium lesions (1). My own observations at that time based upon the study of two kidneys in which the tuberculous process had produced alterations of but slight extent, were illuminating in so far as they changed

May 9, 1914, was of normal size, and externally no sign of a tuberculous process could be seen. A casual examination of the bisected specimen failed to reveal the presence of any tuberculous lesion, so slight were the changes in this kidney. In one of the papillæ of the upper pole, however, and in the neighboring portion of the calyx and pelvis, there were distinct tuberculous lesions. These were present in the form of alterations in the tip of a papilla and of involvement of the wall of the corresponding calyx. On the whole, it might be said that the changes in the papilla were not as advanced nor as old as those in the adjoining calyx. Careful inspection showed that the tip of the papilla was absent, the normal, pointed, smooth surface being replaced by an irregularly flattened and soft area (Fig. 4). Partly occupying one of the adjoining recesses and apparently involving the wall of the calyx, there were two lenticular areas of thickening, an extent of about one centimetre by five millimetres being changed by this process. Here the calyx was very much thickened, coagulation necrosis had taken place, the wall of the calyx being converted into a firm indurated mass. Elsewhere in the pelvis the changes were very minute, only a few scattered miliary tubercles being discernible.

Microscopic examination of the solitary affected papilla showed the usual advanced lesion of tuberculosis, extensive coagulation necrosis of the tip of the papilla, and farther inward toward the cortex some discrete and some coalescing miliary tubercles. The most extensive lesion, however, was that which involved the wall of the calyx, where the areas of yellow necrosis, so easily seen on the macroscopic examination, presented histologically the usual late changes of tuberculosis. In Fig. 5 the calyx wall was seen to be very much thickened and replaced by a very dense mass of coagulation necrosis. In the periphery of this tissue some recent tubercles could be made out.

In this case it seems undeniable that the necrotic lesions in the calyx and pelvis are at least as advanced as, if not older than, that of the tip of the papilla.

That the peculiar cheesy lesions are characteristic of tuberculosis, even in the absence of the specific histological changes, a study of many tuberculous kidneys and ureters has taught me.

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SINGLE SUTURE APPENDICECTOMY.

By ARTHUR J. WALSCHIED, M. D.,

New York,

Clinical Professor of Gynecology, Polyclinic Medical School and Hospital.

It is somewhat with a feeling of apprehension that I present this method of single suture appendicectomy. If its technic is not original, I want to say that my error in its publication is more that of omission than commission and beg the grace of the originator of the method. If, however, my idea is original, then I urge its recognition and its use in those instances where it is suitable for adoption.

Some time ago I was very much impressed by the condition of a patient who was referred to me suffering from an acute attack of appendicitis with localized peritonitis.

CASE.—This patient had been ill for forty-eight hours and the progress of bacterial virulence and activity had been severe and rapid. The adjacent structures were bound down, which struck me as peculiar, for the patient had violent projectile vomiting, due to a spastic, constricted, circumscribed, or kinked ileus. She presented a very dubious picture as regarded prognosis. The immediate operation was not out of the ordinary and the appendix not difficult to remove. It was ruptured and lying in pus, which, when swabbed out, presented a marked pocket

bound down by small intestine and cecum. There were also extensive adhesions mainly involving the infundibulopelvic edge and closing up any possibility of getting into the cul de sac. She had had a previous hysterectomy for fibroid. The patient died of an intestinal obstruction two and one half days after the operation, further surgical procedure having been refused.

Probably I shall be criticised for removing the appendix, but I can readily explain this by saying that it was revealed immediately under the incision, directly under the abdominal wall, and was very easy to shell out. The pertinent question here is: Why did not the operator after completing the hysterectomy remove the appendix? The answer might be that apparently it was not necessary, that the appendix was not affected, or that the patient's condition was such that he feared to produce further shock. This, therefore, brings up the question. Should the appendix be removed in every pelvic operation? I make it a rule to do so in every instance and so align myself with the "radical" operators. If the patient's condition is poor, I feel that in the single suture method operation can be performed in from five to six minutes and the small amount of handling and technic is nil as compared

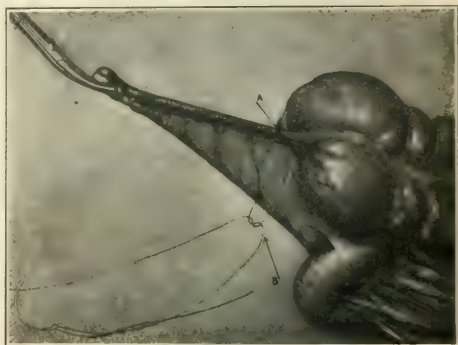


FIG. 1.—First step in single suture appendicectomy. A, first suture; B, tying off the appendicular mesentery.

to the future risk the patient runs. What better answer to the argument is there than the case I have just mentioned?

There are a number of important principles in abdominal surgery which must be adhered to in order to be successful in technic and end results. First of all, there must be a clear, unobstructed field of operation. To have this terrain unobscured, the Trendelenburg posture must be assumed, and not merely for the sake of elevating the hips. The principal object here is to allow the intestines to leave the pelvis so they can be kept in the upper abdominal quadrant. In addition to the proper posture, and in the greatest majority of instances, particularly in obese patients, walling off is called for. This step does not mean an unsystematic, rough method of pushing and mauling with moist, too small abdominal pads, having still smaller strings attached, into the abdominal cavity; but a careful, gentle, step by step procedure with the least amount of mechanical injury to the peritoneal endothelial cells, and still less amount of intestinal

exposure to the air. The peritoneal function of osmosis, diffusion, filtration, and cellular activity for absorption must be protected, and the predisposition to ileus from trauma should constantly be kept in mind. Many annoying postoperative fac-

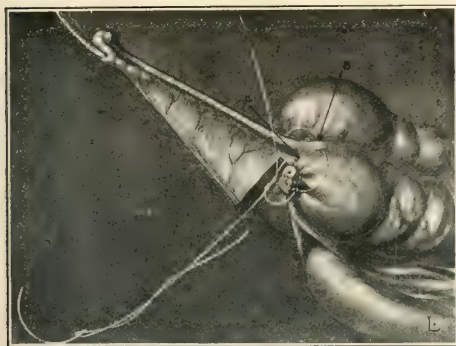


FIG. 2.—B, Lembert Czerny stitch one-quarter inch from base of stump of appendix in longitudinal striae of cecum; C, stitch in mesentery between first mesenteric converging stump and appendicular base.

tors are avoided by this precaution, for even the most brilliant operation may be nullified by their occurrence, ranging from acute exacerbation of ileus to that of organized constrictive bands of intestinal adhesions. The most clever operator may perform the most insignificant pelvic operation and still have the most distressing symptoms follow imperfect technic. Some patients seem to have an

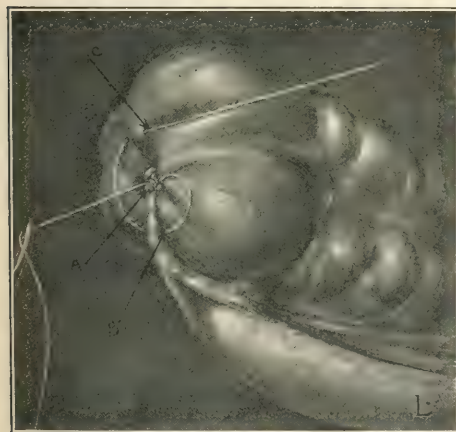


FIG. 3.—A, suture tied to proximal end of first knot; B, picking up fold of Treves; C, final stitch, taking up a prominent portion of cecum.

idiosyncrasy for forming adhesions and developing celoid skin formation. Then again it has been shown that thirty centimetres from the ileocecal valve, the ileum, through its freely movable mesentery, has a tendency to attach itself anywhere over and upon the broad ligament and uterus.

Taking these few facts into consideration and remembering the anatomy of the infundibulopelvic ligament in its appendicular relations, it is apparent that appendicectomy is indicated following pelvic operations. Not only is the operation indicated, but the selection of a technic is called for which answers every purpose of speed, simplicity, and gentle manipulation.

The patient first of all is replaced from the Trendelenburg to the horizontal posture. The tip of the appendix is picked up with a clamp. A long sixteen to eighteen inch suture is carried through the clear triangular space located at the base and internal to the appendix bounded by one of the terminal branches of the appendicular artery, (Fig. 1 A) and both sides made up of the appendix on the right and the cecum on the left, the apex formed by the internal portion of the appendicular base and cecum. The next step ties off the appendicular mesentery including the appendicular artery (Fig.



FIG. 1. The knot tied and the completed appendicectomy.

1 B). The circulation having been entirely cut off, the mesentery is cut free from the appendix, leaving a stump, as is shown in Fig. 2. Continuous with the appendix at its base is the longitudinal striae of the cecum. One quarter of an inch from this base the needle is carried in a Lembert Czerny stitch as a fixation suture to prevent the ligature from slipping (Fig. 2 B). The needle is now carried back to the internal portion of the base and picks up a portion of the mesentery between the first mesenteric circulation converging stump and the appendicular base, Fig. 2 C. The suture is tied to the proximal end of the first knot (Fig. 3 A). The mesenteric stump is turned over to be fixed against the base of the appendix. A clamp is applied and the appendix is removed, the stump treated with ninety-five per cent. carbolio acid followed by alcohol. Anterior to the appendicular mesentery and upon the lower portion of the cecum, running in the direction of the ileum, there is always a fascial fold called the fold of Treves. This fold is picked up by the needle, Fig. 3 B, is carried to the

opposite side, taking up a prominent portion of the cecum, Fig. 3 C. The foot is tied, covering over and completing the operation with one suture and in a very few minutes (Fig. 4).

The simplicity of this technic and its expediency are certainly apparent, as well as the fact that the possibility of a future attack of appendicitis is out of the question.

218 WEST SIXTY-THIRD STREET.

HOSPITAL TREATMENT VERSUS HOME TREATMENT.*

By JOHN W. BRANNAN, M. D.,
New York,

President of Bellevue and Albion Hospitals.

In a medical practice of thirty years and considerable experience both in hospital treatment and in home treatment, I have had to decide or help in deciding between the hospital and the home, a question which comes to all physicians not once but many times, and not only professionally but also in our own family relationships. If we could have in the home the advantage of constant care day and night, trained nurses and doctors always on duty, apparatus and appliances always at hand, there would be no question and we should all prefer home treatment. But we know that only in the homes of the well to do are all these to be found, and often for that reason we choose the hospital, for in the hospital we have them all. In the hospital also if a physician or surgeon is needed for consultation there is no delay, nor is there any added charge which, as you know, is considerable in private practice.

The appliances I have spoken of are not only important in treatment but are also most valuable in diagnosis. The best known of these is the x ray, which is now a necessary adjunct of every hospital. In Bellevue more than ninety sets of plates are made each day, not only of surgical conditions such as fractures, but also of medical cases in which the nature of the disease is more or less obscure. In private practice the usual charge for x ray pictures is twenty-five dollars, whereas in the hospital there is no cost at all to the patient. Then there are the analyses of the urine, sputum, and other secretions that are made in practically all cases; the examination of the blood for typhoid fever and malaria, the Wassermann test for syphilis. In diseases of the stomach and bowels, or the gastrointestinal diseases, if there is any question about the need of an operation, a bismuth meal is given and an x ray taken which gives us a true picture of the conditions within the body. With the fluoroscope, an attachment of the x ray machine, we are able to see the exact condition of the lungs, heart, liver, and other internal organs. All of these very necessary procedures cost a considerable sum outside the hospital. Among the facilities and apparatus for treatment we have the

hydrotherapeutic department for giving baths and douches of various kinds, different temperatures, and varying pressure; also electric baths and general electrical treatment. There are the Zander machines for exercising the muscles and restoring the functions of stiffened joints; also the baking apparatus for treating all forms of rheumatism and affections of the nerves. I must not forget to mention fresh air and sunshine which are to be had in abundance, which is not the case in the average home.

The discipline of the hospital is very important. In the home it is not always easy for a doctor to have his instructions carried out in all their details, when there is no nurse in charge. The family may not understand or they forget, or they are overruled by anxious friends or relatives, and the patient suffers in consequence. In the hospital the doctor's orders are carried out at all times throughout the twenty-four hours. In cases of emergency a patient is better off in a hospital. This applies to medical as well as surgical conditions. In typhoid fever a perforation of the bowel may suddenly occur, calling for immediate operation. If a surgeon is obtained at once the patient may be saved, but if there is a delay of even a few hours the patient dies in the great majority of cases.

In recent years great progress has been made in the dietetic treatment of disease. By means of an apparatus called a calorimeter it is possible to determine the amount of food of different kinds that is digested and assimilated by a person in health or in disease. Dr. Warren Coleman was the first to use this apparatus in his studies of typhoid fever in Bellevue Hospital. He learned and has taught us that in giving our patients in typhoid the customary three to four pints of milk a day we were starving them unnecessarily. They were getting the equivalent of about 1,200 calories, a calory being the amount of heat required to raise the temperature of one kilogram of water 1° C., whereas a patient in fever needs from 3,000 to 4,000 calories to replace waste, and can take and assimilate that amount if the food is properly chosen. We now give our patients apple sauce, bread and toast, butter, cooked cereals, crackers, milk, cream, eggs, potatoes, rice, and milk sugar to the amount of 3,000 to 5,000 calories a day, the number of calories given depending upon the needs and power of assimilation of the individual patient. A man in health leading a sedentary life will require about 3,000 calories and get through his work, whereas a laborer may need 5,000 calories. A typhoid patient lies quietly in bed but the fever is burning up his tissues and he needs as much food as a person at work. In disease of the kidneys and in disease of the heart and other organs similar tests have been made and we know much more about the feeding and treatment of those diseases than we did before. A great advance has been made in the last few years in the treatment of diabetes. Doctor Allen, of the Rockefeller Institute, has perfected a system of dieting by which a diabetic may ultimately eat freely of a variety of foods without a return of his symptoms. For the first two or three days the patient receives nothing at all except in some cases

*An address delivered to the city physicians at the Municipal Building, City of New York, Oct. 18, 1917, under the auspices of the Committee on Education of the Welfare Committee of the Borough of Manhattan, Leonard Felix Fuld, Ph.D., chairman.

a little whiskey. Then for several days he is given green vegetables which contain a minimum of starch. Then there is a gradual return to ordinary diet according to a carefully prepared schedule. It would be extremely difficult to carry out this treatment except in a hospital. In the home, members of the family are naturally inclined to give the patient food outside of the rigid diet imposed. Even in the hospital the other patients in the ward have to be carefully watched to prevent their doing the same thing.

During the past week or ten days I have asked some of my medical friends which they would prefer if asked to choose between hospital or home treatment, and without exception they have declared for the hospital. This was especially true of the surgeons. In the case of patients requiring operation it is natural that the surgeon should prefer the hospital operating room with its complete equipment of sterilized instruments and dressings, its perfect illumination, and assistance at all times of trained doctors and nurses, and all at a minimum expense. In case of fractures the patient can be cared for at home after the bone has been set and placed in plaster, the patient returning to the hospital from time to time to have the plaster changed or removed. But if the patient is a man his care imposes a heavy burden upon the family and it is a great relief to them to have him in the hospital during the long weeks of convalescence. If the patient is a woman and mother she also is better off in the hospital, but she is generally needed at home to help in looking after the children, even though she is partly disabled. In chronic surgical cases, such as disease of the bone, the hospital is the only proper place, but unfortunately the supply of hospital beds for chronic diseases is very inadequate.

In medical cases, the patient can generally be cared for at home if the illness is of short duration. Long illnesses are apt to wear out every one in the family unless they are able to employ a nurse. If the disease is infectious, such as typhoid fever, there is danger of contagion for the rest of the household. I remember an instance of such infection a number of years ago at Bellevue, when five children from a family were brought to the children's ward one after another with typhoid fever. We had no social service at that time but I finally went to the home and found the mother recovering from an attack of typhoid. She still had a phlebitis or milk leg. During her illness she had taken care of the children as best she could and at the same time had infected them with the disease. I also remember that they all happily recovered. Another instance of home infection came to my attention a few months ago when a woman was brought to Bellevue suffering from typhoid fever and a week or two later I learned that her four children had been taken to another hospital all ill with the same disease. In the hospital we practically never have a case of secondary infection. Other infectious diseases such as scarlet fever, diphtheria, etc., are best cared for in the hospital because of the danger to others in the family. Of late we have advised that children with measles should be kept at home

if the conditions there are fairly good, as we have found that they do not do so well in the hospital if the wards are crowded. Patients with tuberculosis should, as a rule, go to a hospital or a sanatorium, if the disease is advanced. If the patient must remain at home he should have a room to himself provided with light and air and sunshine, and be instructed as to the care of his sputum so as not to infect others of the family.

If any case calls for home treatment it would seem to be a maternity case and yet many women prefer to go to a hospital. This is true even of fairly well to do people who live in small apartments. There are hospitals now in New York at which a prospective mother can have a room to herself and have more privacy and better care at less expense than at home. Patients requiring operative treatment on the eye or the ear or the throat find it to their advantage to go to special eye and ear hospitals where they can have the services of an oculist or aurist at a moderate cost. Unfortunately, there are not enough such special hospitals in New York for the demand. At Bellevue we have recently been able to open wards for this class of patients where they will be under the care of trained specialists.

What shall we say of children and babies? If the mothers have time to care for the babies themselves or can employ a nurse and have the services of a good physician, the babies are undoubtedly better off at home than in the hospital. In the tenement, however, the mothers, as a rule, have other children to look after and have no nurses and cannot have a doctor in constant attendance. In such cases the hospital offers them skilled nursing and specialists trained in diseases of children. Miss Lillian Wald, of the Henry Street Settlement, is doing splendid work in supplying nurses for infants and young children in the home. Her results in the treatment of pneumonia cannot be approached by us in the hospital. Her mortality is only five or six per cent., while that in the best children's hospitals reaches twenty-five to thirty per cent. It must be remembered, however, that, in the hospital we get the patients in whom the disease is much further advanced. Many a mother keeps her child until her money is exhausted and then brings him to the hospital and our doctors have to do the best they can with an almost hopeless case. For older children the hospital offers many advantages, especially in surgical cases such as burns and street accidents, of which we have increasing numbers year by year. I have already referred to the need of hospital care for cases of infectious disease, the majority of which of course are in children. Bottle fed infants and infants with marasmus or diarrheal diseases can also be better cared for in children's hospitals, where great advances have been made in recent years in the scientific feeding of infants. In the babies' ward at Bellevue over 400 bottles of food are prepared daily, each bottle containing milk modified for an individual child. Breast milk is also provided for those infants that need it most.

Some children's specialists, among them Dr. Henry Dwight Chapin, believe that very young children

and infants who have recovered from acute pneumonia in the hospital should be sent home to convalesce, as they find that they do not thrive after a long sojourn in a ward in more or less close proximity with other young children. There is much to be said for this view, though if the wards are well ventilated by open windows and transoms by day and by night, and the children are put out on the open porch when the weather is fair, they would probably do even better in the hospital than in the home. Rowland Godfrey Freeman in his children's ward with open roof attachment at Roosevelt Hospital, has shown what splendid results can be obtained in the pneumonia and diarrheal diseases of young children by the free use of fresh air and sunshine. Unfortunately, doctors and nurses still share in the fear of drafts that is so deeply rooted in the public mind.

In closing this consideration of hospital treatment versus home treatment in which I have dwelt so strongly upon the advantages of the hospital, I am reminded of a story of Daniel Webster. The story runs that on one occasion when he had expressed himself with his usual vigor on one side of some public question and was asked to hear the other side, he thundered back: "There is no other side." But in this case there is another side and that is the sentimental side, all the sentiment that attaches to the word home. How often do we hear a person say: "If I am going to be ill I want to be ill at home." And it is this feeling, this wish to be with one's own family at a time of sickness and suffering, that leads us to prefer the home in spite of all the allurements of the hospital that I have described above. It is only when impelled by necessity that most people go to the hospital, and this necessity applies with especial force to the poor. Unfortunately, it is the poor, particularly the foreign born, who dread the hospital most. All the more reason then, that we who have to do with hospitals should treat our patients not only with professional skill, but also with kindness and consideration. Let us make them feel that the hospital is their home for the time being and belongs to them, which indeed is nothing but the truth, though we do not always look at it in that way. The physicians of three or four generations ago used to speak of curing a patient *tuto, cite et jucunde*—sately, quickly and happily. This is a maxim that we moderns, in our zeal for scientific efficiency in the hospital, would do well always to bear in mind, with especial emphasis upon *jucunde*.

18 WEST FIFTY FIRST STREET.

Bacteriemia in Lobar Pneumonia.—Alan C. Sutton and Charles E. Sevier (*Bulletin of the Johns Hopkins Hospital*, October, 1917) state that the blood culture is the most valuable prognostic aid in pneumonia. Of their cases, ninety-three per cent. with negative blood cultures recovered. Of the cases with positive cultures, all with over five colonies per c. c. at any period of the disease died, with one exception, a patient who received serum treatment shortly after admission to the hospital. Generally the incidence of septicemia runs parallel with the mortality.

BODY FLEXIBILITY.

Its Influence on Health.

By STEWART LEWIS, M. D.,
Lakehurst, N. J.

We are all familiar with the great flexibility of the infant body, and the movements of the contortionist show how completely this may be preserved; yet most of us as we approach middle age become, compared to the child body, almost as if we were cased in a plaster cast. We limit our range of motions to the ordinary demands of our lives and become incapable of exceeding these. Does not this disuse of the tissues tend to impaired function, lowered resistance, and finally to local and indirectly to general disorders? Surely it must. Bodily flexibility can only be well retained by vigilant attention. I disagree with the advice in an army manual, that the older soldiers be given, at exercise time, "a few minutes of light and entertaining exercise" to "keep them busy." The real test is the practical.

Extending a motion as far as we can we frequently find it limited by a tight band, the opposing muscle. Attempting to stretch this by steady pull, intermittent pull, or massage, we seldom succeed, in fact may actually stimulate the muscle to increased contraction. *If, however, we keep up steady tension and secure the muscle back and forth we note a fine and then a coarser crackling sensation and the resistance yields.*

Almost every one of us has a "weak spot" somewhere, some part of the body which tends to trouble us, especially when we are a bit tired, by a feeling of disagreeable tightness, pressure, even pain. Such difficulties may be greatly relieved by proper exercise of the part, preferably the entire body, to restore flexibility, muscle balance, and tone; neglected, they may go on to serious disorders. All activities, especially the athletic and gymnastic, are of value for correction of such disturbances but I do not know of any exercises planned directly with this object in view and I herewith suggest a few which I have found very effective. Understanding the principle, the patient soon learns to detect his own stiffnesses and work them out, inventing new exercises for himself. In some cases these exercises may be taken even violently to break up obstinate resistance. This is exceptional. They should always be taken vigorously and with attention. While each exercise has its special indications the whole group form a fine tonic drill, giving a pleasant sense of wellbeing like that after a great yawn. As an eye opener for the day, and to take out the kinks of fatigue, they are a luxury. To use them successfully one must "get the idea" and learn to recognize the sensations indicative of proper performance. Mere wobbling, wagging, or rotating the part is of little value.

EXERCISES.

Head and neck.—These exercises are especially helpful for the tired head and stiff neck of the brain worker or the nerve wearied person. 1. Force the head as far back as possible, looking upward. Force head as far to the left as possible, all the time trying to force it farther back. Move

the head to right. Repeat five times and return to normal position. 2. Force head as far as possible toward left shoulder. Swing head as far forward as possible, all the time reaching toward left shoulder. Swing the head back as above. Repeat five times and return to normal position. Note the tightness of opposite side of neck, followed by crackling and relief. 3. Head right—opposite of above.

Trunk.—Position, body erect, head back, chest up. Hands on hips, thumbs to rear. 4. This exercise is especially helpful for bad posture and for tired and sensitive back of the nerve tired. Lean as far backward as possible. Keep abdomen in. Swing as far to left as possible but forcing backward. Do not bend knees. Keep heels on ground. As you bend to one side raise opposite elbow as far as possible, to get pull of latissimus on spine. Bend to the right. Repeat five times and return to erect position. 5. Bend as far as possible to the left. Raise left elbow. Front. Back. 6. Bend right, then same as above. Front bending exercise on same principle may be used, but very little in cases of bad posture.

Shoulder.—7. Swing arms in half or full circle, stretching shoulder muscles all you can.

Lumbar and thigh.—This exercise is for selected cases of static backache and sacroiliac strain and is not used in regular drill. 8. Lie on table or high bed, body below hips hanging over the side. Swing legs both together, left and right.

Leg and foot.—This is especially useful for prevention and cure of flat foot. 9. Stand erect, rise on tiptoes and sink as usually prescribed but with this modification: Stand pigeon toed and as you exercise try to force the toes more and more inward and heels outward. Be sure to rise just as high as you possibly can.

In many cases of the class referred to the condition may have progressed beyond stiffness to actual tenderness and pain. It is difficult to decide whether one may exercise in such a case. I can only suggest that one proceed cautiously. Some times by experiment we find an exercise which gives grateful relief, as in tenderness at one point near a joint it may prove very helpful to stretch the muscles on the opposite side thus relieving tension. If good judgment is shown in removing causes, such as overwork, bad nervous habits, etc., the relief afforded by these exercises is permanent. Better results will often be obtained if the patient is not only carefully instructed but the movement assisted manually, and the use of a considerable degree of force is sometimes permissible. A slight sprain may occur but requires only a day or two of rest.

PINETREE INN.

Absorption of Apomorphine and Morphine Through the Conjunctiva.—David I. Macht (*Journal A. M. A.*, April 28, 1917) cites many instances from the literature showing the occurrence of poisoning from absorption of active alkaloids after instillation into the conjunctiva and proves that such absorption can take place very rapidly by experiments on dogs.

A COMPARISON OF THE PHYSICAL CONDITION OF PRISONERS ON ADMISSION AND ON DISCHARGE.

BY FRANK L. HEACOX, M. D.,

Auburn, N. Y.,

Physician, Auburn State Prison.

In presenting this study of the physical condition of adult delinquents, we have proceeded a step further than in previous years. Heretofore we have had to content ourselves with the tabulation of the results of physical examinations on admission only. This past fiscal year, by reason of better organization of work, we have been enabled to record the physical condition of inmates on their departure from this prison, and have tabulated the results of these examinations in the same manner as the admission examinations. Hence we are able to make a definite comparison of the condition of men entering and departing from prison.

The method of classification¹ and tabulation as used in previous years has been continued, that is, classification of good, fair, and poor as to general health and working condition; and the enumeration of pathological defects by psychological systems with the number of inmates in each classification showing such defects. The examinations made at time of discharge were conducted in the same manner as on admission and by the same examiner. In this study we have omitted the use of columns for the classes of good, fair and poor in enumerating pathological defects in order to facilitate a comparison between admission and discharge statistics, but a comparison is made between the numbers found in each of these classes. The total number of those admitted was 510, and the number discharged was 584, classified as follows:

	On admission	On discharge
Health good	377	459
Health fair	95	92
Health poor	38	20
Died	—	13
Total	510	584
Total number examined	—	1094

The sources from which they were admitted were as follows:

		Percentage
Auburn Prison District (Courts).....	336	65.9
Sing Sing Prison.....	124	24.3
Returned for violation of parole.....	27	5.3
Eastern New York Reformatory.....	10	1.9
Clinton Prison.....	5	1.
Returned from escape.....	4	0.8
Great Meadow Prison.....	4	0.8
Total	510	100.

The following tables are arranged to show a comparison of the physical condition of the men received from these various sources:

PHYSICAL CONDITION IN RELATION TO SOURCE RECEIVED.

From:	Health good	Health fair	Health poor	Total
Auburn Prison District.....	241	67	28	336
Sing Sing	95	23	6	124
Violation of parole.....	22	2	3	27

¹This method of classification has not been satisfactory to the author, being found too indefinite and incomprehensive, and after examining several methods of physical and nutritional classifications he has adopted a method for the succeeding year that he believes will prove adaptable to all penal institutions.

COMPARISON OF PERCENTAGES OF DEFECTS BY SOURCE RECEIVED

(Continued.)

	Count	Health good	Health fair and poor	Total
Eastern N. Y. Reformatory	8	2	0	10
Clinton	4	0	1	5
Returned from escape	3	1	0	4
Great Meadow	4	0	0	4
Total	19	3	1	50

COMPARISON OF PERCENTAGES

	Health good	Health fair and poor	Total
Auburn Prison District	71	20	91
Sing Sing	79	21	100
Returned for violation of parole	82	18	100
Eastern New York Reformatory	80	20	100
Clinton	80	20	100
Returned from escape	75	25	100
Great Meadow	100	0	100
All sources	74	26	100

SUMMARY

	Health good	Health fair and poor	Total
From outside sources: courts, violation of parole, and return from escape	266	101	367
From other prisons	144	32	176
Total	410	133	543

COMPARISON OF PERCENTAGES

	Health good	Health fair and poor	Total
From outside sources: courts, violation of parole, and return from escape	73	27	100
From other prisons	77	23	100

It has seemed desirable to further subdivide those included in the Auburn Prison District group, which of course are those received directly from the courts, and specify the counties from which they were received. Under each county is enumerated the total number of inmates from that county and the percentages in relation to health. The counties are arranged in the order of percentages of good health.

PHYSICAL CONDITION IN RELATION TO COUNTIES WHERE CONVICTED.

Counties	Total	Percentage health good	Percentage health fair and poor
Cortland	2	0	100
Delaware	3	1	100
Lewis	1	0	100
Schuyler	1	0	100
Monroe	21	4	86
Seneca	6	1	83
Broome	10	4	79
Chautauque	0	2	78
Ontario	12	2	75
Otsego	8	2	75
Tioga	4	1	75
Eric	62	12	73
Onondaga	37	7	73
Steuben	7	1	71
Cattaraugus	20	4	70
Jefferson	27	5	70
Chester	13	3	69
Oneida	29	0	69
Cayuga	0	2	67
Genesee	3	1	67
Herkimer	6	1	67
Wyoming	3	1	67
Oswego	14	3	64
Nassau	5	1	60
Alleghany	4	1	50
Madison	2	0	50
Tompkins	4	1	50
Chemung	3	1	33
Livingston	1	0	0
Wayne	1	0	0
Average		71	
All sources		74	

The pathological defects, with the number of inmates in each classification showing each, are enumerated in the following tables:

ALIMENTARY SYSTEM.

	Number	Percentage	Number	Percentage
Canines teeth	267	52.3	164	28.1
Indigestion	99	19.4	90	15.4
Constipation	53	12.3	131	22.4
Peptic ulcer adenitis	40	9.6	21	3.6
Spleen enlarged	30	5.9	22	3.8
Hemorrhoids	27	5.3	31	5.3
Hernias	19	3.6	22	3.8
Chronic appendicitis	3	0.6	0	0
Liver enlarged	3	0.6	5	0.8
Tongue tied	3	0.6	0	0
Fistula in ano	2	0.4	0	0
Diarrhea	2	0.4	0	0
Liver contracted	2	0.4	6	1.0
Mucous patches in mouth	2	0.4	0	0
Leukoplakia of mouth	1	0.2	2	0.3
Ulcer on tongue			1	0.1
Enteritis			1	0.1
Hypertrophic cirrhosis			1	0.1
Recovering from hernia operation			1	0.1

RESPIRATORY SYSTEM.

	Number	Percentage	Number	Percentage
Deviated septum	225	44.1	177	30.3
Chronic pharyngitis	196	38.4	148	25.3
Hypertrophic rhinitis	150	29.4	131	22.4
Enlarged tonsils	104	20.4	104	17.8
Tuberculous suspect	50	9.8	17	2.9
Spur on septum	31	6.1	50	8.4
Acute bronchitis	27	5.3	18	3.1
Ulcerated septum	21	4.1	21	3.6
Atrophic rhinitis	19	3.7	28	4.8
Perforated septum	11	2.1	12	2
Coryza	10	1.9	0	0
Chronic bronchitis	8	1.6	0	0
Nasal polypus	5	1	6	1
Pulmonary tuberculosis	4	0.8	44	7.5
Laryngitis, chronic	3	0.6	7	1.2
Pleurisy, chronic	2	0.4	2	0.3
Edematous tonsillitis	1	0.2	0	0
Asthma	1	0.2	4	0.7
Tonsils cryptic			5	0.8
Laryngeal tuberculosis			4	0.7
Pharynx deformed and scarred			3	0.5
Adenoids			1	0.1

CIRCULATORY SYSTEM.

	Number	Percentage	Number	Percentage
Mitral regurgitation	17	3.3	20	3.4
Arteriosclerosis	14	2.7	14	2.4
Myocarditis	13	2.5	9	1.5
Tachycardia without other cardiac signs	12	2.3	12	2
Mitral regurgitation and pulmonic stenosis	10	1.9	4	0.7
Cardiac hypertrophy without other cardiac signs	10	1.9	7	1.2
Pulmonic stenosis	8	1.6	5	0.8
Hemic murmur	8	1.6	11	1.9
Aortic stenosis	8	1.6	9	1.5
Mitral regurgitation and aortic stenosis	5	1	1	0.1
Cardiac arrhythmia without other cardiac signs	3	0.6	3	0.5
Tricuspid regurgitation	2	0.4	2	0.3
Bradycardia without other cardiac signs	1	0.2	1	0.1
Pulmonic regurgitation	1	0.2	0	0
Mitral stenosis	1	0.2	2	0.3
Aortic regurgitation and aortic stenosis			2	0.3
Tricuspid regurgitation and tricuspid stenosis			1	0.1

	—On Admission—		—On Discharge—	
	Number	Percentage	Number	Percentage
Aortic stenosis and pul-				
monic stenosis	1	0.1		
Mitral regurgitation and				
mitral stenosis	2	0.3		
Aortic regurgitation	1	0.1		
Total, endocarditis	52	10.1	50	8.5

GENITOURINARY SYSTEM.

	—On Admission—		—On Discharge—	
	Number	Percentage	Number	Percentage
Gonorrhea	27	5.3	0	0
Varicocele	19	3.7	22	3.8
Urethral stricture	6	1.1	6	1
Phimosis	0	0	2	0.3
Epididymitis	5	1	5	0.8
Enlarged prostate	5	1	3	0.5
Chancere	4	0.8	0	0
Undescended testicle	2	0.4	1	0.1
Hypospadias	2	0.4	2	0.3
Incompletely circumcised	2	0.4	0	0
Cystitis	2	0.4	5	0.8
Inguinal bubo	1	0.2	0	0
Retracted frenum	1	0.2	0	0
Nephritis, chronic			3	0.5
Testicle retracted			1	0.1
Testicle atrophied			1	0.1
Stenosis of urethral open-				
ing			1	0.1
Wassermann tests resulted as follows				
Negative	449	88		
Positive	61	12		

GLANDULAR SYSTEM.

	—On Admission—		—On Discharge—	
	Number	Percentage	Number	Percentage
Inguinal enlarged	150	29.4	120	20.5
Cervical enlarged	143	28	160	27.4
Epitrochlear enlarged	115	22.3	95	16.2
Thyroid enlarged with				
symptoms of exophthal-				
mic goitre	6	1.1	0	0
Thyroid enlarged	4	0.8	9	1.5
Submaxillary enlarged	3	0.6	0	0
Supraclavicular enlarged	2	0.4	0	0
Axillary enlarged			2	0.3

CUTANEOUS SYSTEM.

	—On Admission—		—On Discharge—	
	Number	Percentage	Number	Percentage
Acne	18	3.5	22	3.8
Secondary syphilitic eruption				
	14	2.7	2	0.3
Eczema	10	1.9	12	2
Scabies	4	0.8	0	0
Tinea versicolor	2	0.4	1	0.1
Psoriasis	2	0.4	3	0.5
Sebaceous cyst	2	0.4	3	0.5
Lipoma	1	0.2	0	0
Urticaria	1	0.2	0	0
Seborrhea	1	0.2	1	0.1
Alopecia	1	0.2	2	0.3
Vitiligo			1	0.1
Furunculosis			1	0.1
Recovering from incised wound on hand			1	0.1
Ingrowing toenails			1	0.1
Varicose ulcer of leg			1	0.1

NERVOUS SYSTEM—GENERAL.

	—On Admission—		—On Discharge—	
	Number	Percentage	Number	Percentage
Attacks of dizziness	10	1.9	0	0
Nervousness, general	9	1.8	0	0
Speech defect	8	1.6	5	0.8
Symptoms of exophthalmic goitre	8	1.6	5	0.8
Alcoholism, chronic	4	0.8	2	0.3
Epilepsy	4	0.8	7	1.2
Periodical headaches	3	0.6	0	0
Occasional fainting spells	3	0.6	0	0
Symptoms of previous head injury	2	0.4	3	0.5
Recovering from hemiplegia	1	0.2	0	0

	—On Admission—		—On Discharge—	
	Number	Percentage	Number	Percentage
Symptoms of "drug with-				
drawal	1	0.2	0	0
Neurasthenia	1	0.2	0	0
Hysteria	1	0.2	1	0.1
Psychopathic			30	5.1
Psychosis (committed)			9	1.5
Psychosis suspected			7	1.2
Facial paralysis			3	0.5
Chorea			1	0.1
Hysterical contracture arm and leg			1	0.1
Cerebrospinal syphilis			1	0.1
Tabes dorsalis			1	0.1

NERVOUS SYSTEM—EYES.

	—On Admission—		—On Discharge—	
	Number	Percentage	Number	Percentage
Defective vision	238	46.7	170	29.1
Conjunctivitis	18	3.5	23	4
Strabismus	7	1.3	7	1.2
Pterygium	6	1.1	4	0.7
Blepharitis	4	0.8	0	0
Optic atrophy	3	0.6	2	0.3
Traumatic amblyopia	1	0.2	4	0.7
Corneal scar	2	0.4	3	0.5
Ecchymosis	2	0.4	0	0
Traumatic deformity of iris	1	0.2	0	0
Enucleated left eye	1	0.2	0	0
Nystagmus	1	0.2	0	0
Iritis	1	0.2	0	0
Trachoma	1	0.2	0	0
Trichiasis			1	0.1
Chalazion			2	0.3
Ceratitis			1	0.1
Subconjunctival hemorrhage			1	0.1

NERVOUS SYSTEM—EARS.

	—On Admission—		—On Discharge—	
	Number	Percentage	Number	Percentage
Impacted cerumen	25	4.9	19	3.3
Otitis media (chronic)	12	2.3	13	2.2
Deafness (partial)	11	2.1	30	5.1
Membrane perforated	3	0.6	2	0.3
Mastoid sinus			1	0.1
Polypus in external auditory canal			1	0.1

ARTICULAR AND MUSCULAR SYSTEM.

	—On Admission—		—On Discharge—	
	Number	Percentage	Number	Percentage
Rheumatism (chronic)	56	10.9	66	11.3
Sciatica	2	0.4	0	0
Syphilitic joint pains	2	0.4	3	0.5
Thumb sprained	1	0.2	0	0
Lameness from gunshot wound of leg	1	0.2	0	0
Chronic luxation of thumb	1	0.2	0	0
Periosteitis, tibia			1	0.1
Spondylitis, tubercular			1	0.1

DEFORMITIES.

	—On Admission—		—On Discharge—	
	Number	Percentage	Number	Percentage
Traumatic stiffness:				
One finger	11		15	
Two fingers	0		3	
Elbow	2		3	
Spine	2		0	
All fingers of one hand	1		2	
Shoulder	1		1	
Wrist	1		1	
Knee	1		3	
Ankle	0		3	
Hip	0		2	
Total	10	3.7	33	5.7
Traumatic deformity:				
One finger	8		14	
Two fingers	2		2	
All fingers of one hand	1		1	
Right leg	1		0	
Three fingers	0		2	
Wrist	0		2	
Total	12	2.3	21	3.6

DEFORMITIES. (Continued).

	—On Admission—		—On Discharge—	
	Number	Percentage	Number	Percentage
Amputations:				
One arm	1		3	
Right leg	1		0	
One finger	0		5	
Three fingers	0		1	
Two toes	0		1	
One foot	0		1	
Both legs	0		1	
Total	2	0.4	12	2
Congenital deformity right hand	2	0.4	0	0
Scoliosis	1	0.2	2	0.3
Kyphosis	0	0	3	0.5
Atrophy:				
Arm and leg	0		1	
Right leg	0		1	
Left leg	0		1	
Total	0		3	0.5
Ununited fracture left patella	0		1	0.1
Hammer toes	0		1	0.1

SUMMARY OF PATHOLOGICAL DEFECTS.

	—On Admission—		—On Discharge—	
	Number	Percentage	Number	Percentage
Total number of defects.....	2005	100	2353	100
Systems:				
Alimentary	572	21.9	498	21.1
Respiratory	868	33.3	762	32.3
Circulatory	113	4.3	107	4.5
Genitourinary	82	3.1	52	2.2
Cutaneous	56	2.1	51	2.1
Glandular	423	12.3	386	16.4
Nervous, general	55	2.1	76	3.2
Special senses—eyes	286	10.9	218	9.2
Special senses—ears	51	1.9	56	2.3
Articular and muscular	63	2.4	71	3
Deformities	30	1.3	76	3.2

The method of discharge from prison, with the number and percentage of each, follows:

	Number	Percentage
Paroled	90	15.4
Transferred—		
To Great Meadow Prison	167	28.6
To Clinton Prison	135	23.2
To Sing Sing Prison	8	1.3
To Dannemora State Hospital (Insane)	9	1.5
Discharged by expiration or commutation	162	27.8
Died	13	2.2
Total	584	100

The following table shows a comparison of the number in each health classification:

	Health good	Health fair	Health poor	Total
Paroled	68	20	2	90
Transferred—				
To Great Meadow	160	6	1	167
To Clinton	93	36	6	135
To Dannemora State Hospital	8	1	0	9
To Sing Sing	8	0	0	8
Discharged by expiration or commutation	122	20	11	162
Died				13
Total	450	92	20	584

The following table shows percentages represented by the statistics in the table above:

	Health good	Health fair and poor
All methods	78.6	19.2
Paroled	75.5	24.5

Transferred—

To Great Meadow	95.8	4.2
To Clinton	68.8	31.2
Dannemora State Hospital	88.8	11.2
Discharged by expiration or commutation	75.3	24.7

A comparison of the number in the various classes is made between those admitted and those discharged with the following result:

	Total number	In good health	In fair and poor health
Admitted during year	510	377	133
Discharged during year	584	459	*125

*Including died, 13.

The percentages are as follows:

	In good health	In fair and poor health
Admitted during year	74	26
Discharged during year	78.6	21.4

While this comparison demonstrates that there was a slightly larger percentage of men, 4.6 per cent. discharged from prison in good health, than was admitted during the year, it is not a fair index, since in each group we are dealing with an entirely different set of men. To meet this objection we have in the following tables taken into consideration only the men who were discharged during the year, and referring to their examination on admission have grouped them accordingly into their classifications of good, fair, and poor. Following we have arranged the statistics to show the classification of these discharged men at the time they were admitted to prison, with the percentage following:

Physical condition of same men at time of their admission

Discharged during the year in:	Total	Good	Fair	Poor
Good health	450	413	33	13
Fair health	92	28	41	23
Poor health	20	7	0	13
Total	571	448	74	40
Died	13	6	4	3
Totals	584	454	78	52

Percentages of above statistics:

Physical condition of same men at time of their admission

Discharged during the year in:	Total	Good	Fair	Poor
Good health	78.6	90	7.2	2.8
Fair health	15.8	30.4	44.6	25
Poor health	3.4	35	0	65
Died	2.2	46.1	30.8	23.1

The next table is a reverse of the previous table, and grouping their condition on admission, shows their condition of health on discharge. The percentages follow:

	Physical condition at time of discharge				
Physical condition on admission	Total	Good	Fair	Poor	Died
Good	454	413	28	7	6
Fair	78	33	41	0	4
Poor	52	13	23	13	3
Total	584	450	92	20	13

Percentage above statistics:

	Physical condition at time of discharge				
Physical condition on admission	Total	Good	Fair	Poor	Died
Good	77.7	91	6.2	1.5	1.3
Fair	13.4	42.3	52.6	0	5.1
Poor	8.9	25	44.2	25	5.8

An arrangement of these three groups in the following table shows the comparison to still better advantage:

	Total	Health good	Health fair	Health poor
Admitted during year.....	510	377	95	38
Discharged during year.....	*571	459	92	20
Latter at time of admission	584	454	78	52

*Died, 13.

Percentages of above statistics:

	Health good	Health fair	Health poor
Admitted during year.....	73.9	18.6	7.5
Discharged during year.....	78.6	15.7	5.4
Latter at time of their admission..	77.7	13.4	8.9

Another method of comparison can be used to advantage. In this we consider each health group separately, and show how many remained in that group at the time of their discharge and how many changed to another group. The first group comprises those who were in good health on admission:

	Good	Fair	Poor	Died	Percentage
In good health on admission	454				
Condition on discharge.....	413	28	7	6	
Number deteriorated	41			9	

The second group comprises those who were in fair health on admission:

	Good	Fair	Poor	Died	Percentage
In fair health on admission		78			
Condition on discharge.....	33	41	0	4	
Number improved	33			23.6	
Number deteriorated			4	5.1	

The third group comprises those who were in poor health on admission:

	Good	Fair	Poor	Died	Percentage
In poor health on admission			52		
Condition on discharge.....	13	23	13	3	
Number improved		36		69.2	
Number deteriorated			3	5.7	

The following is a comparison of the number and percentage of those showing improvement and those showing deterioration as determined by their groupings:

	Number	Percentage
Total improved	60	11.8
Total deteriorated	48	8.3

CONCLUSIONS

1. The prisoners received from other penal institutions are in better physical condition at time of admission to this prison than those received from the courts and other outside sources.

2. The majority of prisoners are in better physical condition when discharged from this prison than they were when admitted.

3. This improvement is too small to meet the requirements of modern penal and medical standards.

4. The medical department is only a little more than barely able to take care of the illnesses and injuries that arise in the institution.

5. The medical staff, consisting only of two, is already overworked.

6. The improvement in the health of prisoners may be greatly increased by the following means: sanitary housing conditions; properly balanced diet; adequate medical staff.

THE ORGANIZATION OF THE DEPARTMENT OF PHYSICAL EDUCATION OF THE ROCHESTER PUBLIC SCHOOLS.*

By HERMAN J. NORTON,
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There was never a period in the history of our country when so much time, energy, thought, and money were being expended by public school authorities for the physical wellbeing of school children as there are today. Recognition of this fact and a glimpse into the future fill us with enthusiasm with the realization that our profession is rapidly being placed on a par with other departments in school systems throughout the land. With this proper leveling of our profession and the universal application of its principles by school authorities comes also the realization of the increasingly important part that physical educators are bound to play in the great fight which is being started to halt the march of the organic diseases and in the earnest effort to endow each child or student with a strong physical foundation which in the last analysis should be one of the fundamental aims of every rational system of education. Before presenting an outline of the organization of the Department of Physical Education of the Rochester Public Schools I shall refer to the attitude of a large number of school people toward our profession. Physical educators are on trial; the educational spot light is upon us, and we must clearly recognize the shortcomings found among members of our profession, as well as our opportunities and correct the former at the earliest possible date. Our shortcomings are as follows: 1, the designation and advocacy of the Swedish or the German system as the one and only correct system of physical education for school children; 2, the failure to realize the importance of personal and community instruction in hygiene and its practical adaptation as one of the most fundamental phases of physical education; 3, the lack of cultural education in the ranks of our profession; 4, the lack of adequately trained workers in the basic subjects of physical education.

For purposes of description, I shall divide the Department of Physical Education of Rochester into three parts: elementary schools, high schools, and normal school. There are forty-two elementary schools, twenty-eight of which are equipped with gymnasiums, assembly halls, or playrooms in which instruction in games, folk dancing, athletics, etc., is given. Seven schools have a swimming pool and baths. Two more schools are equipped with shower baths only. Twenty-eight schools are equipped with outdoor play spaces, ten of which are well equipped playgrounds with directors in charge all the year round. The teaching force of the elementary schools, including the director of the department, numbers twelve. The aim of the elementary school work is threefold: 1. To take each child at an early stage of his growth and development period and en-

*Read before the American School Hygiene Association, Albany, N. Y., June 8, 1917.

courage him by means of a rapid daily health inspection and a graded and systematic course of instruction in story plays, setting up drills, games, hygiene, rhythm, gymnastic drills, and athletics, to build a firm physical foundation upon which his intellectual education may safely be based. 2. Through supervised play to offer each child an opportunity to exercise the deep seated emotions which control his conduct, such as desire, fear, elation, and anger, and under the teacher's direction ultimately to enable him to develop those moral qualities of fair play, selfcontrol, loyalty, honesty, sense of justice, and an appreciation of the rights of others, all of which tend strongly to develop the true spirit of democracy and good citizenship. 3. To aid each teacher to secure and maintain for herself the highest degree of health which is essential for happiness and efficiency.

Daily health inspection.—Teachers make a rapid daily health inspection of all pupils at the beginning of the morning session. They follow Dr. Thomas D. Wood's outline, Signs of Health, Disorders, and Physical Defects in School Children. From October 1st to December 1st and from February 15th to April 15th, pupils of grades five to eight inclusive organize themselves into health clubs and ten to twelve health questions are asked each morning by the health club president.

Story plays.—These plays are given to the pupils of the first grades only. They aim to present in an interesting and informal manner simple exercises calling into play large muscle groups and stimulating vital organs. Furthermore, they tend to develop the powers of imagination, observation, and attention. The exercises involve vigorous imitation of every day associations, such as "washing day," "sweeping day," and various seasonal associations, such as "winter sports," "circus day," etc.

Setting up drills.—Four two minute periods of setting up drills are given daily to the pupils of grades two to eight inclusive in accordance with the State physical training law. These exercises are arranged in ten lessons for each semester and the instruction on each lesson continues for two weeks. The exercises of each lesson are graded to meet the age conditions of the various periods of child life and are classified in the following manner according to their function and purpose: First period: Marching develops discipline, alertness, and inhibition. Deep breathing aids circulation; tends to increase elasticity and capacity of lungs; favorably influences functions of the liver and other abdominal organs; teaches correct habit of breathing. Second period: Facings and steps are for the same purpose as marching above; corrective exercises counteract faulty classroom positions and develop correct posture; precipitant exercises produce organic vigor; deep breathing. Third period: Corrective exercises; trunk exercises in the odd lessons develop back and abdominal muscles, organic activity, and good posture; balance exercises in the even lessons develop poise and muscular control; precipitant exercises; deep breathing. Fourth period: Running produces organic activity, especially of organs of circulation and respiration, and relieves venous congestion; facings; deep breathing. Fifth period:

Games develop good social and moral qualities. Believing that "correct posture and carriage of the body is of fundamental importance for health and efficiency, a pronounced element of beauty, and an expression of energy and intelligence," I have repeatedly asked teachers to place particular emphasis on good posture not only during the setting up drills but throughout the school day. However, I found that it was not enough to ask teachers to emphasize good posture at all times, but that some incentive had to be placed before the children in order to enlist their interest and to get good results along posture lines, for experience has shown that "material is educational just in so far as it creates an interest." Consequently we developed the following posture game which has strongly appealed to the children and produced a marked improvement in posture in all forty-two schools. This posture game is, in brief, played by having each teacher place the following diagram on one of the corners of the front blackboard:

Team (or votes)	POSTURE GAME.	
	Points won	Honor roll
1
2
3
4
5
6

The game is explained to the children as follows: At the end of the morning session one point will be given to the team, or row, having had the best all round posture, sitting, standing, and walking. Again at the end of the afternoon session, a point will be awarded to the team having had the best all round posture. At the end of the week a small American flag will be given to the team having scored the largest number of points. This flag is to be held for one week and then awarded to the team winning it for the next week. As soon as a team has won the flag once, the numeral 1 will be placed opposite this team in the honor column. Each time a team wins the flag a numeral representing the number of times the team has done so will be placed in the honor column. The pupil sitting in the front seat of each row will be the team leader. It will be his duty to go to the diagram each time his team wins a posture point and score the same for his team. When a supervising teacher visits the rooms she can easily see what rows have held the flag the largest number of times and make comments accordingly. Once in five weeks she awards posture pennants to the two rooms in each school having the best all round posture.

Games.—The pupils of all grades receive at least twelve minutes of supervised play instruction each day. In grades five to eight, inclusive, the pupils are divided into two permanent teams, red and blue. Each team elects its own captain and these captains are responsible for placing their players and aiding the teacher in running off all room or playground games. In two schools, where the organization differs from the general form, the pupils of grades three to six, inclusive, receive at least twenty minutes a day of game instruction. Besides the above instruction, there are over 1,000 boys and 1,000 girls of the fifth, sixth, seventh, and eighth

grades who are receiving two hours of after school recreation instruction each week through the Boys' and Girls' Recreation Clubs.

Hygiene.—The teachers of all grades follow our regular outlined course of study on hygiene and physiology and give one twenty minute period of instruction a week. In the first three grades the work outlined is very simple and emphasis is placed on fixing certain important health habits. In grades four and five, an elementary textbook is used. In grades six, seven, and eight a more advanced textbook is used, but technical terms and intricate processes are taught only in so far as they are necessary for the intelligent building of healthy bodies. All matter not essential to the cultivation of health and strength is omitted, but information which will lead pupils to develop and protect their bodies is frequently and forcefully presented. Accurate instruc-

How many brushed their teeth once yesterday? (b) How many brushed their teeth twice yesterday? (c) How many brushed their teeth three times yesterday? 3. (a) How many cleaned their fingernails once yesterday? (b) How many cleaned their fingernails twice yesterday? (c) How many cleaned their fingernails three times yesterday? 4. How many brushed their shoes before leaving home and cleaned them on the school mat before entering the school building yesterday? 5. How many slept at least nine hours last night? 6. How many kept their pencils and fingers out of their mouths yesterday? 7. How many combed and brushed their hair before coming to school yesterday? 8. How many practised at least three exercises yesterday? 9. How many had a clean handkerchief yesterday? 10. How many washed their hands and faces before meals and before going

ROCHESTER PUBLIC SCHOOLS.
HEALTH LEAGUE RECORD

School..... Grade.....		HEALTH LEAGUE RECORD														Week Ending Monday, 191.....			
Days	Windows open	Teeth Times cleaned			Fingernails Times cleaned			Shoes	Sleep 9 hrs.	Pencils and fingers	Hair	Exercises	Handker- chiefs	Face and hands	Posture	School sanitation	Baths No. taken		Total points
		1	2	3	1	2	3										1	2	
Monday.....	Points 3	1	2	3	1	2	3	1	3	1	1	1	1	1	1	1	1	2	.....
Tuesday.....	4	.....
Wednesday.....
Thursday.....
Friday.....
Baths.....
Total Points.....

NOTE: 1. A Health League certificate will be given to each pupil in any grade, provided the grade wins 15,000 points. 2. A Health League merit pin will be given to each pupil in any grade, provided the grade wins 28,000 points. 3. Each pupil scores points each time he raises his hand in answer to any one of the Health League questions. 4. This record blank may be taken home each day, but it must be in the pupil's hand when answering the health questions asked by the president.

SCHOOL SANITATION REPORT.

Name of Pupil Making Report

tion is given as to the best methods of giving aid in all common accidents and emergencies.

The Health League.—In the spring and fall of 1916, I organized and conducted Health League campaigns. The results of these campaigns were of such a character as to warrant the continuance of this type of work. Once each semester, October 1st to December 1st and February 15th to April 15th, each teacher of grades five to eight, inclusive, organizes her pupils into a Health Club and makes a special drive on the formation of good health habits. The aim of the Health League, which comprises all the health clubs in the public schools, is to arouse and maintain the interest of the boys and girls in vital health topics; to aid all members in the formation of good health habits; and to co-operate with the teacher, principal, and city health agencies in the interest of good health at all times. On the Health Club organization day, the pupils in each of the above mentioned grades elect by ballot a president, a vice-president, and a secretary. The president takes the chair each day when told to do so and calls the Health Club meeting to order. He asks the following Health League questions: (Questions are changed each semester to include all phases of hygiene instruction) 1. How many slept last night with their window open at least three inches from top and bottom? 2. (a)

to bed last night? 11. How many tried to sit, stand, and walk correctly yesterday? 12. Are there any sanitary reports on conditions within or around the school building? Every Monday the president asks these questions: How many took one bath last week? How many took two baths last week? Every Monday the president appoints a pupil to make and record the thermometer readings for the week; and instructs the secretary as follows: To transfer the total points won by the grade for the previous week from the official grade record blank to the weekly point summary sheet; and to hand the official grade record blank containing the points won by the grade the previous week to the principal. On Friday of each week president instructs the secretary to announce to the grade the total number of points won up to that date and to collect and hand the thermometer blank to the principal.

The secretary takes his seat at the side of the teacher's desk at the same time that the president is summoned to take the chair; he counts the number of hands raised in answer to the president's Health League questions and records the total number of points scored by the grade in each case, and performs duties as outlined under Notes 2 and 3 on the Health League record.

Under the Health Club organization, the teacher has to shoulder a minimum amount of responsi-

bility. The Health Club work might well be termed a selfgoverning and selfinstructing system of teaching hygiene. The officers conduct the meetings; the pupils keep their own records, score their own points, and make reports to their Health Club president. The only responsibility which rests upon the teacher is as follows: to assist pupils in election of Health Club officers; to summon the Health

ROCHESTER PUBLIC SCHOOLS.
HEALTH LEAGUE REPORT
THERMOMETER RECORD.

School Grade	Week Ending		Previous	
	Monday	Tuesday	Monday	Tuesday
1st				
2nd				
3rd				
4th				
5th				
6th				
7th				
8th				
9th				
10th				
11th				
12th				
Averages				

NOTES: 1. The thermometer is to be read once in the morning and once in the afternoon. 2. Each week a new pupil should be assigned to keep the thermometer record. 3. 68° F. is the correct temperature for the schoolrooms and rooms at home.

Name of Pupil Making Report

Club president to the chair each day; to distribute Health League material to each member of the club; to see that the president and secretary follow the instruction as outlined in their letter of instruction and that the meeting is conducted in parliamentary form; to instruct the president to cancel the points reported won by a pupil in case the pupil's appearance does not show that proper attention has been given to the particular point at issue; to see that the secretary hands the proper record blanks to the principal on Monday and Friday of each week. Teachers receive Health League material including definite instructions as to the time of starting club work, method of organizing the club, instructions for club officers, etc., about October 1st and February 15th of each semester.

The following letter which was received from one of our principals at the close of our 1916 fall campaign shows how the work of the Health League is looked upon by school officials:

Many children are sleeping with their bedroom windows open at night, to whom the fresh air in the bed chamber is a new experience. Many are taking pride in keeping their fingernails well manicured, who previously did not bother much about it. Some are, for the first time, practising the valuable exercises of the schoolroom in their own home. In short, there is a keener interest in personal appearance and habits that tend toward physical improvement than I have ever seen before, and I sincerely hope it will continue long after the novelty of the Health Club work has worn off. One of the most beneficial effects seems to lie in the fact that the lessons that the school has been trying to teach for some time link up immediately with the child's interests. For years the teachers have been suggesting baths, clean hands, open windows at night, and the various other items for which credit is given on the Health League blanks, but in the case of many children the advice has gone in one ear and out the other.

Rhythm.—The nature of the rhythm instruction calls for the dances to be done with others as play. All solo dancing is prohibited. This phase of physical education aims to develop the mind and body through movements, such as running, skipping, hopping, and dancing to music. This is developed poise, grace, and ease of motion. Rhythm instruction in grades two to eight inclusive in those schools having a gymnasium, assembly hall or playroom is in direct charge of two special rhythm

teachers who visit each school once every two weeks and give the pupils a twenty minute period of rhythm instruction. First grade teachers give their pupils instruction in simple rhythm dances at least once each week.

Gymnastic drills.—At the present time we have four schools in which the pupils receive gymnastic drill instruction for a period of at least one hour a week under the direction of a special teacher of physical education. Next fall we hope to be able to have these drills in operation throughout the system. The general plan for this hour of instruction is as follows: The first half hour of each week is to include fifteen minutes of mass drill with or without hand apparatus, and fifteen minutes of athletics. The second half hour period is to include fifteen minutes of maze running and marching tactics and fifteen minutes of gymnastic dancing, a combination of calisthenics, dance steps and standard folk dances.

Boys' and Girls' After School Recreation Clubs.—In the fall of 1913 the following plan of organization for the Boys' and Girls' Recreation Clubs was developed. At the present time we are operating thirty-six boys' and thirty-six girls' clubs in the elementary schools. The purpose of the recreation clubs is to provide healthful recreation and opportunities for wholesome social and moral development through athletics, indoor and outdoor sports, entertainments, and other activities. It is the aim of each member of a club to stand for clean speech, clean sports, clean habits, a spirit of loyalty to the school, club director, fellow members, and self, and for a policy of selfgovernment and higher standards of scholarship. The club membership is limited to thirty-five because experience has shown that this number is all one director can handle with any degree of efficiency. Pupils from the eighth grade are admitted first, then pupils from the seventh grades, and if the required number is not forthcoming from these grades, pupils from the sixth grade are allowed to join the club. In several schools where there are but six grades, the membership is made up of the pupils from the fifth and sixth grades. These are called Junior Clubs. The majority of the directors are men who are students in attendance at the University of Rochester. The directors for the girls' clubs are in practically all cases regular grade teachers in the schools. Each director receives fifty, sixty, or seventy cents an hour for club work according to the number of years he or she has served us in this type of work. Each club meets once a week for two hours at the close of school, and the members participate in the following programme under the supervision of the director: 3:35 to 3:50: business meeting in charge of president; 3:50 to 4:00: mass games, all playing, no team competition; 4:00 to 4:15: marching and patriotic exercises; 4:15 to 4:30: instruction in standard athletic events; 4:30 to 5:35: intraclub activities, Harvard and Yale team contests.

At the beginning of each semester, the boys in the various schools elect from among their own number a president, vice-president, and a secretary treasurer. Each president has a gavel with which he calls the meeting to order, opens and closes each

order of business, and conducts the meeting in regular parliamentary form, following this "order of exercises": calling to order by the president; calling of roll by the secretary; reading of minutes of previous meeting; election of new members approved by the principal; unfinished business; new business; signing of the constitution by new members; programme—remarks from the club director; adjournment to playroom. It is through the business meeting that the director gets a firm hold on the boys and has a chance to explain his programme for the day, make arrangements and perfect plans relative to registering his boys for any of our big annual interclub contests. At the adjournment of the business meeting, the boys get into their gymnasium suits and go to the playroom. Here they are divided into two permanent teams, known as Harvard and Yale. They elect two captains whose duty it is to take charge of their teams, keep record of games won and lost, and assist the club director in every way possible.

As soon as the boys adjourn to the playroom they are allowed to "burn off" some of the surplus energy stored up during the afternoon session by engaging in free frolicking mass games which call for no team competition. After ten minutes of directed free play, boys line up and receive a fifteen minute period of instruction in marching tactics. Beginning September, 1917, it is planned to have the instruction in marching tactics conform to such parts of the United States Manual of Infantry Drill as are reasonably applicable. Following the marching tactics, the class is put through a fifteen minute period of mass instruction in the following phases of athletic work: the crouching start; the proper way to leave the mark; how to touch in relay; how to broad jump, standing and running; how to high jump, running; how to put the shot; how to train for the Standard Athletic Badge Test. The boys next form themselves into their Harvard and Yale teams under direction of the captains. These teams then compete in all kinds of relay races, games, and jumping contests. Records of games won and lost are kept and each boy strives hard to make his team come out the winner at the end of the semester in order that he may be awarded a team certificate which testifies that he is a member of the team winning the intraschool all round championship. It is through participation in these intraschool team contests that the boys learn to develop loyalty, self-control and the ability to cooperate and respect the rights of others.

One of the requirements which a boy must pass before he is awarded his school insignia is that he must accompany his club on at least one hike each semester. Club directors are instructed to let the boys decide from among a list of authorized routes what the nature of their hike shall be, i. e., educational, to one of the city's industrial institutions, or recreational, to one of the parks. Last June plans were all perfected for holding our first annual interclub hike to Durand Eastman Park, a distance of seven miles, but weather conditions continued such that it was impossible to hold the hike before school closed. On May 10th this year, we held our first interclub hike. We assembled at the city line at

eight o'clock and hiked six miles to Durand Eastman Park, located on the shore of Lake Ontario, and there the boys collected drift wood, built their own fires, cooked their meat and potatoes, and enjoyed a camper's meal. The afternoon was given over to all kinds of athletic contests in which all the boys took part. Once each term the members of the boys' and girls' club in each school are privileged to hold a joint social at which time, in the case of a school social, the boys usually furnish refreshments in the way of ice cream and the girls bake (?) and bring the cake. If the club decides on a sleighride, the boys usually furnish the sleigh and the girls the home and refreshments. A special programme of activities for such affairs is prepared by the girl and boy club directors. These parties offer to many of the boys and girls the only opportunity they have for learning the social etiquette proper in mixed gatherings.

Each year the great majority of club members participate in the following interclub contests: Thanksgiving cross country run, November; indoor track meet, January; skating carnival, February; swimming, March; baseball league, April and May; spring hike, May; spring outdoor track meet, June. The social results of these interschool contests are very important for a large number of boys become acquainted with athletics and are stimulated to train. The focusing of the interest of a club upon the securing and maintenance of school prestige and honor is a constructive and solidifying socializing force. Every member of a boys' club strives each semester to win his school insignia. This insignia consists of a diamond shaped felt background of the school colors bearing the school number. A boy may win his school insignia by passing the following requirements: He must not be absent from the club more than twice during the semester without a satisfactory excuse accepted by the director. He must show himself to be a good loser as well as a good winner. He must take an active part in the business meetings by standing and addressing the chair at least twice during the semester, making or seconding a motion, or talking on something of interest to the club. He must obey the constitution absolutely. He must go on at least one hike during the semester. He must be an active member of at least one of the regular school athletic teams, track, cross country, swimming, or baseball. He must deposit one dollar in one of the city banks, in order to win his insignia for the first time; two dollars must be on deposit in order to win his insignia the second time, and three dollars on deposit if he wins it the third time. He must win a Health League certificate according to the requirements of his grade health club. He must pass one of the athletic badge tests. A boy need not pass a badge test in order to win his insignia the second time. If he passes the insignia requirements the second time, he is given a star to place in the lower corner of his insignia. A boy trying to win his insignia for the third time must pass the second athletic badge test. He is given a star to place in the upper corner of his insignia.

The City Council of Boys' Clubs which is composed of the presidents of each of the thirty-six

clubs as active members and the vice-presidents and secretaries as associate members, was organized in January, 1914, with the following aims in view: "To strengthen the relations between the boys' clubs; to create and maintain interest and efficiency in the working out of the club activities; to foster athletics for the largest number of boys; to stand for the best sportsmanship, and to cooperate with the officials of the Physical Education Department and city civic agencies in every way possible." This council meets twice each month and has been the means of drawing the members of the various clubs closer together and of making them feel that we are all working toward a common goal. Instruction in carrying on a model business meeting have been given and noted speakers have addressed the council on the topic of Leadership, the All-'Round Boy, etc. This instruction has helped the president and the other officers to understand the responsibility of their positions. In the spring of 1915, the members of the boys' clubs cooperated with the City Health Bureau and actively aided in the city wide clean-up campaign. Again in the fall, the boys, 1,000 strong, organized grammar school safety committees in each school and cooperated with the Chamber of Com-

the attainment of these aims may be stated as follows: 1. To develop organic power, the basis of all physical and mental effort, in the gymnastic drills by the vigorous exercise of large muscle groups and vital organs. In general all high school pupils receive at least one hour of gymnastic drill instruction each week. 2. To secure good posture, daily relaxation, a training in alertness, accuracy of movement, rapid obedience, and orderly response to command by means of the daily setting up drills. There are at least four periods of this type of instruction given each day to all pupils in all high schools. 3. To develop right habits of living by presenting a common sense course of hygiene instruction under the direction of the physical instructors. This arrangement tends to make the pupils look upon the Department of Physical Education as primarily a health department and many students are voluntarily consulting the physical instructors concerning their own physical condition and health habits. 4. To interest every student in some form of recreation, especially those forms that can be played with pleasure and profit in later life. All pupils who cannot receive their one hour of gymnastic drill instruction during school hours are required to report at

THE ROCHESTER SCHOOL SYSTEM IS MEETING THE REQUIREMENTS OF THE NEW STATE PHYSICAL TRAINING LAW AS FOLLOWS:

STATE REQUIREMENTS.	ELEMENTARY SCHOOLS.	TIME PER WEEK.	HIGH SCHOOLS.	TIME PER WEEK.
Physical Training A (Daily Health Inspection)	Being fully met in all schools	Few minutes	Being fully met in all schools	Few minutes
Physical Training B (Setting up Drills)	Being fully met in all schools	At least 40 minutes	Being fully met in all schools	40 to 50 minutes
Physical Training C (Hygiene and Physiology)	Being fully met in all schools	20 minutes	Being fully met in all schools	30 to 60 minutes
Physical Training D (Supervised Recreation)	Being fully met in all schools In two schools pupils of grades 3-6, inclusive, receive 100 minutes of D per week In addition to the above instruction 1,000 girls and 1,000 boys of the 5th, 6th, 7th, and 8th grades in 46 schools receive 120 minutes per week of play in our after school recreation clubs	60 minutes 100 minutes 120 minutes	All students receive either 60 minutes of D or E per week	60 minutes
Physical Training E (Gymnastic Drills)	Four schools operating under this requirement. All other schools meeting requirement D	60 minutes	All students receiving either 60 minutes of E or D	60 minutes

merce in a city wide campaign for "Safety First." Dr. John F. Forbes, secretary treasurer of the Rochester Business Institute, testifies as to the type of work in which the boys' clubs are interested, as follows:

Through my connection with the safety first and fire prevention work of the Chamber of Commerce for nearly two years, I became thoroughly familiar with the work of the boys' clubs, inasmuch as we made most effective use of these clubs in the work in which we were interested. One of the most striking results was the rapid development in an understanding of, and entering into, the community and civic spirit which it is so desirable to foster in the youth of our country. The bringing of the boys' clubs into vital relation with the activities of the Chamber of Commerce was little less than a revelation. The somewhat intimate acquaintance with the actual routine working of the clubs also revealed the fact that they were an admirable supplement to the technical routine of the public schools in the way of developing the power of thinking and of expressing thought in both oral and written forms. I may say in general that I was very greatly impressed with the wisdom and effectiveness of this form of organization in the public schools and hope that it may be widely, if not even universally, extended throughout the country.

There are five high schools carrying a teaching force of twelve physical education instructors. The aims of the high school work and the activities for

the close of school one day a week for instruction in one of the following supervised play activities: soccer football, tennis, golf, hiking, boxing or fencing, basketball, ice hockey, track, baseball, swimming group games.

A graduate of the Boston Normal School of Physical Education is employed as director of the physical education department of our city normal school. The aim of our work in the normal school is twofold: 1, to help the normal student to maintain the highest possible degree of physical efficiency during her normal course and to cultivate habits of daily exercise and hygienic living that will be of lasting benefit to her; 2, to give her a practical knowledge of the various forms of exercises outlined in the city physical education course of study, and the methods of applying them in preparation for her future work in the grades. The course of study covers two years and includes the following types of work: gymnastics and games, practice, 100 hours; folk dancing and rhythmic exercises, practice, sixty hours; methods of teaching games, twenty hours; methods of teaching gymnastics and folk dances, sixty hours.

Our Readers' Monthly Prize Discussions

Twenty-five Dollars Is Awarded for the Most Satisfactory Paper

All persons, whether subscribers or not, are invited to compete for the prize of \$25 offered for the reply deemed best by the editors to the following questions:

CLXXXIX.—How do you treat fainting? (*Closed.*)

CXC.—How do you treat burns? (*Answers due not later than January 15th.*)

CXCI.—How do you treat lobar pneumonia? (*Answers due not later than February 15th.*)

The award will be based solely on the value of the information contained in the answer. No importance will be attached to literary style. Answers should preferably contain not more than six hundred words, and should be written on one side of the paper only. All papers submitted become the property of the JOURNAL, and should bear the full name and address of the author for publication. The prize will not be awarded to the same person more than once within a year.

The prize of \$25 for the best answer to Question CLXXXVIII has been awarded to Dr. Russell J. Smith, of Pocatello, Idaho, whose paper appears below.

PRIZE QUESTION NO. CLXXXVIII.

TREATMENT OF FROSTBITE.

BY RUSSELL J. SMITH, M. D.,
Pocatello, Idaho.

The effects of extreme cold upon the exposed portions of the body such as the fingers, ears, nose, toes, hands and feet, show three forms: 1. The condition of vascular constriction and local anemia followed by bloodvessel paralysis and extreme hyperemia, with transudation into the subcutaneous tissue, does not last long as a rule. 2. If the degree of cold is sufficiently intense, there is ulceration. This may appear at once in the acute forms. The epidermis is raised by a serous or bloody fluid, which breaks and leaves an ulcerated surface that is slow to heal. 3. If the effect is more intense, there are thrombosis and gangrene. Prophylactic measures are important. The hands and feet should be well protected, socks changed frequently, the extremities kept as dry as possible. Accumulating the feet to cold water rubs increases the resistance to low degrees of temperature. Massage with stimulating lotions or dry friction is beneficial. In extreme cold, sprinkling powdered capsicum in the socks will assist in keeping the feet warm.

In the first degree, the application of cold with friction until the circulation is restored and pain relieved is all that is necessary, followed by powdering the part with boric acid, wrapping in wool, and elevating. Evaporating lotions to relieve too great swelling and stimulating applications, such as spirit of camphor, kerosene, and diluted alcohol, are to be used as needed. In the second degree, the ulcerations should be protected from infection by antiseptic dressings. Saturated solution of warm boric acid to cleanse followed by sterile vaselin and gauze with, later on, mild cauterization with silver nitrate if healing is slow, or the application of scarlet red ointment, balsam of Peru, and castor oil, is effective treatment. In gangrene, usually of the dry form, spontaneous separation should as a rule be awaited, trimming off all redundant tissue or any gangrenous remains. In the moist form, separation may be hastened by the use of scissors and knife. The line of demarcation should be awaited and the line of incision should be below it so as not to interfere with the protective zone formed at the line of demarcation. In the presence of

ascending infection, deep incisions should be made in the infected tissue and flushed freely with chlorazene or Dakin's solution.

In chilblain, the treatment is local and constitutional. Locally apply

R Iodine,	4;
Ether,	30;
Collodion flex.,	100.

A simple protective dressing with boric acid or the following ointment will be found beneficial:

R Phenol,	1;
Tr. iodini,	}
Acidi tannici,	
Simple ointment,	4.

Internally, give calcium chloride or lactate, in doses of seven and a half grains three times daily in chloroform water. Do not given longer than four or five days. There is a lack of calcium salts in the tissues of those predisposed to chilblain, and here the administration of these salts seems to act favorably.

Dr. H. M. Stanley, of Creston, Iowa, contributes the following:

Frostbite of minor degree includes cases where parts have been exposed to a low temperature, with the involvement of skin, ears, nose, cheek, fingers, toes, heels, and even the soles of the feet. Frostbite of major degree involves cases in which deep freezing requires major procedure in order to save the life of the individual. In cases of minor degree frostbite where the tissue is not devitalized and where circulation is checked for only a few minutes at most, prompt treatment will alleviate much suffering and will restore the tissue to normal condition almost immediately, whereas in major degree frostbite only prompt surgical intervention will succeed. Treatment for the first class or minor degree frostbite only will be considered here, and it is to be noted that the treatment applies to burns of the first and second degrees as well, with the same degree of success. The inference is that the damage to the tissue and the tissue reaction is similar in each instance, whether the temperature is high or low. It must be understood that certain established rules in technic must be observed in executing and applying the primary dressing in order to obtain the best results. The patient should be seen before the reduction of the frost-

bite takes place. When the dressing is applied before reduction the tissue will return to normal immediately without any aftereffects, such as inflammation, desquamation, or sloughing. Where it is not possible to see the patient at once, directions to retard reduction should be given, such as the old methods of applying ice water and snow, etc.; in this way reduction is retarded and tissue reaction is lessened.

The primary dressing to be applied to the area involved consists of several layers of plain gauze saturated with a solution of camphorated phenol N. F.; this is securely fastened in place and must be left so for from twelve to twenty-four hours. Should it dry out and become a source of irritation, it should be moistened with the solution. Upon removal at the end of the time the parts will present a very normal appearance and will remain normal without further treatment. Should the weather be severe, however, or the parts subject to irritation from clothing, a bland ointment or light dressing is applied. The points most prominently noted in this method over any other is the instant and complete alleviation of pain and the abortion of tissue destruction, such as sloughing and peeling, noticed following a case of untreated frostbite. Chilblains will clear up when this dressing is applied to the parts overnight; it is usually necessary to repeat the application to get complete results.

Dr. Arthur I. Blau, of New York, writes:

Frostbite originates in one of two ways: 1, from the direct action of cold on the tissues, and, 2, from the subsequent inflammation of the tissues, which, though frozen, are not immediately killed. The parts most frequently affected are the hands, feet, nose, and ears, most often in the young with defective circulation. In the severe forms, as result of the prolonged anemia or the inflammatory reaction from too sudden warming, gangrene may set in. In that event, fingers, toes, or ears may be lost.

The therapy of frostbite is prophylactic and curative. In prophylactic treatment it is of prime importance to attend carefully to the general health, and especially to tone up and quicken the circulation. Needless exposure to cold weather should be avoided. Warm woolen underclothing should be worn, being careful to keep exposed parts warm. A warm foot bath, with some salt in it, should be taken at bedtime, followed by a brisk alcohol rub. As an adjuvant electricity from a weak galvanic current may be employed. In curative treatment the frostbitten part should be warmed slowly, so that the blood is readmitted gradually. If the part is warmed too rapidly inflammatory gangrene may set in. It should be gently rubbed with snow or cold water, and warmed by holding in the hands. As reaction sets in a small amount of a warm drink should be given cautiously. If the hands or feet are affected, elevating the limbs will relieve pain. Another mode of treatment, often beneficial, is to soak the part with oil of turpentine.

The aftercare consists in applying one of the various therapeutic agents, as iodine in the form of the tincture or ointment; ichthyol, twenty to fifty per

cent. in water; or equal parts of camphor and belladonna liniments. Calcium lactate may be given in ten grain doses three times a day. In stubborn cases the x ray may be used, two or three exposures usually being sufficient. Persons who suffer from frequent frostbites of the hands or feet, will find that rubbing with snow or cold water daily for two or three days will lessen their susceptibility to frostbites, and in many cases effect a cure. If vesicles are present and they burst, an antiseptic dressing should be applied. If gangrene sets in the part should be kept aseptic and treated under surgical principles till the line of separation is formed, and then treated accordingly.

Dr. J. Otis Carrington, of New Brunswick, N. J., says:

Cold acts as an irritant, first producing contraction of the arterioles, then local anemia and stasis of the blood current, and finally simple inflammation of the skin. In frostbite the superficial layer is always involved, and, if the inflammation is severe enough, the formation of blebs, vesicles, ulcers, or even gangrene results. Do not allow the patient to enter a warm room at once, but keep him in a cool place. Apply friction with snow or towels soaked in icewater, followed by friction with a dry, rough towel and wrap the part with cotton-wool. After restoring warmth the patient may be put to bed in a warm room with hot water bottles to the feet and wrapped in blankets. If he is comatose from the cold, rub the entire body thoroughly with flannel and give hot drinks, such as tea, coffee, brandy, or aromatic spirit of ammonia. If deglutition is impossible, give an enema of milk and brandy. If necessary, use artificial respiration and apply mustard plasters to the heart and spine.

The toes are readily frostbitten. Though this cannot always be prevented, much can be done to minimize the intensity of the condition by avoiding congestion of the feet and legs through the wearing of woolen stockings and large comfortable shoes and the avoidance of tight, circular garters. Attention to personal hygiene will help minimize frostbite in any part of the body by increasing the individual resistance. A daily cold sponge is recommended followed by an alcohol rub and thorough friction with a turkish towel.

As to local measures for the relief of itching and burning, wash the parts with cold salt water, wipe them with dry flannel and apply tincture of iodine one part and soap liniment two parts, twice daily, or tincture of cantharides one part and soap liniment six parts, thrice daily. Equal parts of turpentine and olive oil, rubbed in three or four times daily, are of value. Painting the parts with belladonna liniment is helpful and mustard footbaths relieve. Powdered camphor, fifteen grains to the ounce of vaselin, a little rubbed in, twice daily, is grateful for the itching, as is ichthyol ointment or equal parts of ichthyol and turpentine. Paint vesicles with flexible collodion. If they ulcerate, apply an antiseptic dressing. Sluggish ulcers respond well to equal parts of resin cerate and turpentine. If gangrene develops await a line of demarcation before amputating. All patients

should be treated with good nutritious food, fresh air, free eliminations, and tonics like iron, arsenic, and strychnine or the elixir of the phosphates of iron, quinine, and strychnine.

Dr. Charles C. Henin, of Springfield, Mass., writes:

Frostbite is an effect of cold upon extremities of the body or exposed portions, as the nose, chin, ears, hands, and feet. There are several degrees of frostbite: 1, simple redness or inflammation of the part; 2, vesication; 3, ulceration; and 4, mortification. In the first degree of frostbite there are heat, redness, itching, and slight swelling; the color is purple or bluish, the heat burning, the itching intense, the pain severe. In the second degree, in addition to the redness, there are present one or several vesicles which are filled with a blood stained serum. These may dry up and be replaced with a sound epithelium, or they may degenerate into ulcers, causing the third type of frostbite. In this degree of frostbite the redness is followed by the appearance of blebs filled with bloody serum and the color of the surface changes to a blue and then to a cherry red. The treatment is preventive and curative. Tight gloves or boots are dangerous, as they not only embarrass the circulation and leave no space of warm air, but also prevent motion of the parts encased. The patient should be placed in a cold room, without fire, and the frostbitten parts gently rubbed with snow, or cloths dipped in ice water, and as reaction appears the parts may be wrapped in flannel and stimulants and warm drinks may be cautiously given. When the circulation is restored, the temperature of the room may be raised. When I see a patient with first degree chilblains I use a solution of zinc acetate one dram to a pint of water applied on cloths about every two or three hours. In order to increase the patient's blood coagulability he may be given calcium chloride, codliver oil, preparations of iodine and arsenic, or extract of thyroid in tablet form five grains three times a day after meals. Ulcers should be touched with silver nitrate or copper sulphate. If there is much fetor present I use a solution of permanganate of potash. Sloughs, as soon as it is feasible, are to be removed, and when the line of limitation between the dead and living tissues is well established, if the general condition is favorable, amputation can be performed.

Dr. George Schuyler Bangert, of East Orange, N. J. states:

Under the consideration of prevention of this condition contributory causes, as exposure, improper clothing, poor circulation, lowered vitality, anemia, inactivity, and mental depression should be avoided. In the actual treatment, normal warmth of the part should be restored very gradually, when the skin has not been broken. After this, the patient should be given stimulants and constitutional tonics and relief for the local condition may be had by the use of any one of a great number of soothing and disinfecting preparations. In the presence of an open wound, the part should be kept surgically clean, death of tissues should be limited, odor should be prevented and the growth of new tissue should be promoted.

Abstracts and Reviews.

THE HEALTH DEPARTMENT AND THE CITIZEN.*

Publicity as a Factor in Their Better Cooperation.

By JOHN W. TRASK, M. D.,

Assistant Surgeon, United States Public Health Service.

Progress in communal sanitation and personal hygiene, Doctor Trask said, depended upon the education of the citizen. How that education could best be accomplished merited the most careful consideration. In a general way, the most direct method was instruction in hygiene and sanitation in the grammar grades at school; this should be supplemented by regular courses in the high school by experts from the health department and followed up by a good course in the college curriculum. Every medical school should give a thorough course in hygiene and preventive medicine. Family magazines and educational periodicals could increase their usefulness by maintaining well edited departments for the discussion of matters relating to personal and community hygiene. In newspapers the health column might well be as indispensable as the joke column. This might not be considered as administrative health work. It probably was not. There was, however, a kind of educational work, or rather publicity work, that was strictly a part of administrative health work, i. e., keeping the community informed as to what the health department was doing and the duties and responsibilities of the citizen in relation to the work of the department. This had an educational effect, aroused interest in the department, and gained the intelligent support of the community. This relation was only occasionally found; sometimes the health department was at fault and sometimes the people were blind to their own welfare.

During the last decade, however, health agencies had wisely spent much effort on educational propaganda of various kinds. One way in which the health department could create an interest and impart useful information was by means of disease maps and sanitary maps. It could display, in newspapers and department bulletins and in public places, maps showing the distribution of typhoid fever, diphtheria, infantile paralysis, and other communicable diseases and of surface wells, cess-pools, and other health factors. The citizen, especially the father of children, was very much interested in the presence of communicable disease and of other conditions menacing health. Such activities on the part of the health department caused the community to associate the department with its real work, disease prevention. The use of maps was mentioned merely as an illustration of a graphic method in which the health department might give publicity to the concrete things relating to its work. Where health departments did not gain the adequate support of the community, it was undoubtedly because they did not make use of the right kind of publicity.

*Abstract of a paper read before the Section in Public Health Administration of the American Public Health Association, October 10, 1917.

Medicine and Surgery in the Army and Navy

CAMP HYGIENE AT THE FRONT. II.

By CHARLES GREENE CUMSTON, M. D.,
Genève, Switzerland,

Privat Dozent, University of Geneva, Fellow of the Royal Society of Medicine of London; Honorary Member of the Surgical Society of Belgium, Member of the Surgical Society of Switzerland

Water being the soldier's drink, according to regulations, and since the hydic origin of many diseases is unquestionable, the regimental surgeon should maintain an unceasing vigilance over the source from which it is taken and its purification from a prophylactic viewpoint, the importance of which it is needless to emphasize.

Army bacteriological centres sometimes can analyze drinking water but the result is of value only as far as the one sample examined is concerned. The absolute rule should be: no water of any description should be allowed for drinking purposes until it has been sterilized. This important principle should never be departed from by the regimental surgeon. Chemical procedures for sterilization are much more practical than boiling. I shall first consider the containers destined to hold drinking water after it has been purified for cantonments and trenches, after which a short description will be given of the chemical means of purification.

The containers, either small barrels or reservoirs made of galvanized iron with a capacity of about fifty litres, can be used after being washed out when they are new. They must be cleansed and disinfected periodically and at each refilling the remains of the previous day should be emptied. Disinfection should be systematically done once a week and for this purpose three chemicals are employed, the first of which is formol. The container is filled with a commercial solution of formol, 2:1,000, and allowed to stand for twelve hours. It is then emptied and filled with a 2:1,000 solution of ammonia which is allowed to stand for fifteen minutes. The container is then rinsed out with water until all odor and taste of the solutions have been eliminated. The second manner of disinfection is by potassium permanganate, fifty centigrams to the litre, for one hour; reduction is then made with a solution of sodium hyposulphite, one in a litre, for fifteen minutes. Empty and rinse out with care. The third method is with Javel water, twelve grams in 1,000. The solution is allowed to stand for two hours.

Containers thus prepared are ready to be filled with drinking water. At the cantonment filling can be easily done, but in the case of the trench supply the water is carried to the containers, themselves difficult to transport on account of their weight, in large metal containers of the same type as used by milkmen. The barrels are stood up, and the top is removed and replaced by a wooden edge four to five centimetres wide which receives a cover fitting hermetically. Whatever type of container is used, the water must be drawn off by a faucet and not by removing the cover. To enforce this rule, it is wiser to fix the cover down by some means.

Chemical purification of water is more simple and, therefore, more practicable by the use of Javel

water and is quite generally employed. It is of great service in a shifting theatre of war. Disinfection by potassium permanganate is to be recommended when the water has become cloudy from rainfalls. Purification by sodium hypochlorite is obtained by a solution of commercial concentrated Javel's extract. The weaker solutions have been discarded because they soon lose their strength. A litre of the extract contains from eighty-five to ninety grams of chlorine. Eight mgm. of chlorine is required to sterilize ten litres of very bad water or twenty litres of water of medium purity. With a solution containing eighty-five grams of chlorine in a litre, two drops of Javel's extract for each ten litres of water are required. The water must be thoroughly shaken after the drops have been added and should not be drunk for at least thirty minutes. After this lapse of time, which is the minimum, the excess of chlorine is caused to disappear by adding two to three drops of a ten per cent. solution of sodium hyposulphite. This last operation is absolutely necessary, because if the water has a disagreeable taste the men will not take it. Instead of directly introducing Javel's extract into the container, it is to be recommended to dilute the necessary dose in one or several litres of water which are then emptied into the barrel. By so doing the mixing of the hypochlorite and the water in the container is more surely accomplished. A very clever automatic device has been proposed in cases where it is necessary to treat water which is incessantly renewed by a given output by the hypochlorite method. The apparatus consists of a bottle with a double tubulature (see Fig. 1) with a capacity from five to ten litres of Javel water with a regulated output which is assured by a constant pressure on the lower tube no matter at what height this tube may be. This tube is furnished with a faucet R made of perfectly ground glass; the upper tube D is closed by a cork through which a tube E open at its ends, passes, while the lower end reaches to within one centimetre above the level of tube C. The output of water to be purified having been estimated, the flow from the faucet R of the distributor is regulated to allow the necessary quantity of hypochlorite for purification of a given amount of water flowing off in a given time, to escape. By this means the water destined for a body of men can be treated, by organizing its purification in reservoirs which give off distributing pipes. The hypochlorite is mixed with the water during a march, and the action of chlorine has time to be effected before the water is delivered to the men.

Lambert's procedure of purification requires the successive use of two different powders, composed as follow:

POWDER I.	
Potassium permanganate. }	.....ää p. e.
Sodium carbonate, sicc., }	.....ää p. e.
POWDER II.	
Manganese sulphat sicc }	.....ää p. e.
Aluminium sulphat .... }	.....ää p. e.

Put a sufficient quantity of No. 1 to color the water a manifest pink, allowing it to stand for at least one half hour, the time necessary for the destruction of organic matter and pathogenic bacteria. The longer the duration of contact, the more complete will be the sterilization. The appearance of a rosy tint indicates that the necessary amount of powder has been used. It is essential to stir the mixture thoroughly. At the end of not less than thirty minutes, an equal amount of powder No. II is added and the container violently shaken. The rosy tint now becomes brownish and a very thick gelatinous precipitate forms, which imprison the spores which have not been destroyed by the permanganate. This slowly sinks

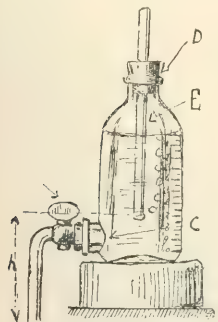


FIG. 1.—Water purification apparatus with sodium hypochlorite, tube E running through cork D to within one centimetre of outlet C.

to the bottom. The stirring promotes reduction. Since purification of water by this technic is rather slow, it is well to have two barrels, one with a sign stating "Drinking water," on the other, "Water undergoing disinfection" (see Fig. 2). Under the faucet of the barrel of water ready for consumption a funnel is attached containing a filter composed of two perforated metallic plates, between which is a layer of absorbent cotton. Water thus treated is as limpid as spring water; it is bacteriologically and chemically purified and is tasteless. All things taken into consideration the procedure with sodium hypochlorite is the most generally emphasized and is preferable in many respects. In actual operations this method allows the carrying out of the process en route quite as well as in cantonments.

Another important point in camp hygiene is the establishments of bathing facilities, bodily cleanliness

of the troops being an absolute necessity. Shower baths are one of the best means to control the development of parasites, and at the same time assures disinfection of clothing and underwear of the men coming to the bath. At the beginning of hostilities it was

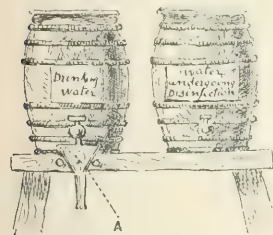


FIG. 2.—Water casks. A, filter.

necessary to improvise baths with the material to be found on the spot. The simplest procedure used was two lye washing machines for heating the water and a large cask for a reservoir. This was placed three metres above the ground and lead pipes were connected with it and the stream of water played on the men.

In another cantonment, the bathroom contained a large tank. This was emptied and the heated water

was poured into the reservoir of an old hand fire engine and the stream played on the naked men. This rendered great service, but as the regiment had to leave the village the fire engine was left behind as it was not easy of transportation. I merely mention these devices as being of interest and also to give an idea of some of the difficulties encountered by the French army surgeons at the beginning of the war. All this, however, has fortunately changed.

The French army is now using with much satisfaction a movable bath installation devised by Charles Blanc. It is easily taken to pieces and can be transported and set up anywhere. A detailed description would be too long, but I would say that in one unit of 1,500 men, the apparatus furnishes a weekly bath to each man. I would also recall the Swiss bath train system as being very practical for cantonments reached by rail and they usually are. This was described in my Medical Notes from the Front in the issue of November 10, 1917, of the MEDICAL JOURNAL, page 895. The shower bath consists of three phases, wetting, soaping, and rinsing off. This method economizes the quantity of water

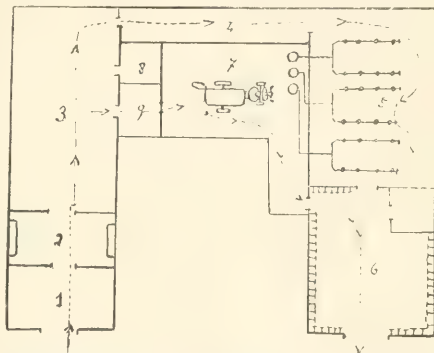


FIG. 3.—Cleansing station: 1, waiting room; 2, barber's room; 3, undressing room; 4, lobby; 5, shower bath; 6, dressing room; 7, machine room; 8, 9, rooms in which clothing is received preparatory to disinfecting.

for each man. The amount doused on each man is from nine to ten litres at a temperature of from 99° to 104° F. A unit of 1,500 men possesses 500 towels divided into two lots of 250 each, one lot being used while the other is being washed and dried.

Besides the weekly baths, rustic washstands are constructed for the daily toilet. These are composed of a wooden conduit pierced with holes at necessary intervals and placed above a wooden trough to receive the waste and carry it off. The ground about the washstand is covered by planks. In the trenches a number of metal pails are allowed the men, as constructed washstands are impracticable. The water is usually obtained from wells with pumps constructed by the engineering corps along the front near the first line trenches. The men, therefore, have no excuse to be dirty but a constant supervision is necessary to obtain good results.

Clothing is frequently inspected and disinfected. A practical way is to place two barrels one above the other and connected with each other by a num-

ber of holes. The clothing is put into the upper barrel and a stick of sulphur is burnt in the bung hole of the lower. The sulphur vapors reach the upper barrel whose atmosphere has been made slightly damp. When on the march this simple procedure must be replaced by energetic brushing, followed by disinfection with benzene or gasoline. A derivative of benzene called anisol is said to have an elective action for parasites, but its high cost precludes its routine use. Underclothing of linen or cotton are washed with soap and boiled for ten minutes in plain water, or better still in a 5:1,000 solution of carbonate of soda. If running water can be found, nothing is easier than washing clothes; otherwise boards placed upon stands near wells can be used but care must be taken that the dirty water does not run back into the well.

Besides these simple regimental baths and disinfection of clothing, the French army has important lice exterminating centres where the men are sent when possible. Their object is to offer a haircut to each man, disinfection of all clothing in a sterilizer, a complete change of underclothing, a bath, and even hot drinks. The arrangement of one of these institutions will be seen in the accompanying diagram, Fig. 3. There are two parallel buildings connected by a third divided into a lobby, 4, and a machine room, 7. The men enter the waitingroom, 1, then pass through the barber's care, clipping machines only being used. Next they come to the undressing room, 3, on the walls of which are nailed forty-eight numbered coat pegs on each of which is hung a bag having a corresponding number. All the personal belongings are put in the bag. The man next makes a bundle of his underclothing and another containing his clothes, the latter being tied with a string with a tag bearing the same number as the peg. At the end of the room are two office windows through one of which the man passes his underclothing and his clothing in at the other. Both bundles of clothing are disinfected while the man is having his bath. The bag containing the man's personal belongings is transferred by a nurse to the dressing room and there hung on a peg with the corresponding number. Once undressed and relieved of all his belongings the man goes into the shower bath, 5, where he is given a piece of soap and a towel. When the bath is over he goes to the dressing room where he is given clean underclothing, his sterilized uniform, and hot drinks, and he leaves the establishment in perfect cleanliness and free from every kind of parasite. An installation such as the above can bathe 40,000 men in twenty-four days, in other words 540 a day. The staff consists of a surgeon, pharmacist, and ten men under the command of a corporal. These establishments are perfect from the viewpoint of hygiene.

X Ray Work at the Front.—According to Colonel T. H. Goodwin, the x ray is used extensively at the front, and a fracture is practically never operated on without the x ray plate in the window for reference. The medical officer on duty notes all cases needing an x ray and when the surgeon begins operating, plates are ready.

ORTHOPEDIC SURGERY IN THE WAR.

How American Surgeons Are Preparing to Meet Orthopedic Problems.—Instruction and Organization.—Economic Status of the Cripple and His Reconstruction.

At a meeting of the Philadelphia County Medical Society in Philadelphia, Wednesday, November 28th, a symposium on the topic of orthopedic surgery in the war was held, the president, Dr. HENRY D. JUMP, major in the Medical Reserve Corps, in the chair. The following article consists of abstracts of the various papers.

ACTIVITIES IN ORTHOPEDIC SURGERY IN THE WAR.

Major David Silver, in his opening address on the activities in orthopedic surgery in the war, said that in the organization of orthopedic surgery the Surgeon General had been guided very largely by the experience of the English army and had in addition paid special reference to the following points: 1, the securing of a sufficient personnel; 2, provision for an ample number of beds; 3, the reception of the wounded soldier as early as possible in the division to which he belonged, and with the least possible change of dressing. The securing of the personnel, he observed, had progressed satisfactorily, about eighty-five men now training in Europe, sixty men assigned to camps in this country, and eighty or more placed in courses of instruction, with a considerable number still unassigned. Especial attention had been paid to the training of men lacking an adequate fundamental knowledge of orthopedic surgery. For these men the plan of instruction consisted of intensive courses of six weeks' duration, work in the cantonment hospitals under qualified orthopedic surgeons, and later work abroad as assistants to qualified men. Efforts were also being made to instruct medical men generally, line officers, and enlisted men themselves in the care of the feet, the handling of minor joint injuries, and the simpler injuries of the back.

In organizing the work in France the Surgeon General had arranged for the establishment of an orthopedic section in each hospital. This would be placed beside the fracture section in order that the same brace and curative appliance workshops might be used for both. About five to seven and one half per cent. of the wounded were expected to be returned to this country; these would be placed in the general reconstruction hospitals now being planned in the various sections of the country. Here the reeducation work would be carried out. It was stated that the Surgeon General had established a laboratory for the study of the various problems connected with artificial limbs. While it was thought that there would be little difficulty in supplying artificial legs to the soldiers, production of which had reached a high degree of perfection in the hands of the American manufacturer, the question of the substitute arm presented more difficulties because of the complicated demands made upon it in the attempt to supply the functions performed by the normal hand. So far it has been found more satisfactory to use some form of mechanical hook for labor, reserving the hand for social use.

Orthopedic surgery was concerned also with the

industrial problem which was quite as important as the military. The comparison of statistics in his opinion clearly demonstrated the great importance of applying to industrial work the same plan which had proved so valuable in military work. The economic loss through industrial accidents, he believed, ultimately assumed an importance equal to the casualties of war. In view of the industrial struggle likely to follow the termination of the war Major Silver believed it of vital importance that the re-education plan embrace both the military and the industrial need.

SOCIAL ASPECTS OF ORTHOPEDIC SURGERY IN THE WAR.

Major Henry R. Hayes recalled that during the European struggle prior to America's entry into the war that which impressed the country above all else was the frightful loss in the unearned increment of the young men of the nations involved. To alleviate such a condition the United States Government had said to those returned, disabled in service: "We will restore or reconstruct you physically and mentally so far as possible. We will still further reeducate you if you cannot be returned to service, that you may earn a living which will be in addition to the compensation which you will regularly receive from the Government for the injuries incurred in service. All this will be done for you while in the army." While casually the problem might not seem to be one of large proportions, analysis would not bear out this opinion; the man returned disabled would probably need, in addition to the surgical treatment received overseas, further surgical and curative treatment at home. His medical and mental limitations with relation to the character of his previous occupation in civil life must be carefully studied by the medical and vocational board to determine the specific training he should have. England and France, it was said, had made great advance in surgical and social reconstruction. It was the function of surgeons and physicians to state what men with given disabilities could not do. Experts in vocational training must advise what trades should be taught the disabled. Employers and employees must advise upon the local trade and labor markets. There must be fundamental organization that employers and employees may not be asked to take unreasonable risks; neither should there be discrimination against the cripple. A man reconstructed and reeducated must be presented to society, equipped to earn the pay of a given job. Reference was made to the fact that in the State Compensation Act one of the difficult problems yet to be solved was that of the extra liability involved in the employment of a disabled soldier. It would seem unreasonable to ask the employer to assume this liability. Another question to be studied was that of the requirements of organized labor with relation to the closed shop and its bearing upon the reeducation and employment of the disabled soldiers. Exemptions under the National Army Draft Law, it was said, had been astonishingly large and not a small number of such disabilities were orthopedic in character. This situation was being studied by one department of the Government that such disabilities in younger and

future generations might be minimized. Reconstruction work would require the close cooperation of army Federal bureaus, State and local officials, and civilian organizations. Industrial surgery, he believed, was destined to make rapid progress. There had been more industrial injuries per annum in this country than there would probably be in the war. It was hoped that the experience acquired from orthopedic surgery in the war might be adapted to industrial and civic reconstruction that there might be a more sound body politic and the "passing of the cripple."

DISCUSSION.

Dr. G. G. Davis, member of the Orthopedic Advisory Council, remarked upon the apparent necessity of the occurrence of a great war to arouse the people to a sense of their responsibility. Recognizing the importance of the military and industrial reconstruction Doctor Davis felt that the civilian cripple was not yet receiving the attention to which he was entitled. Too few institutions were maintained for reconstructive work alone. For general surgical work there was ample provision, but a standing rule in such hospitals was that the patient treated for injury should not remain more than three months. While some cripples could be cured within this time, many could not, and as a result throughout the community there was a class of cripples evidencing this lack of provision for their proper care. His own work gave ample illustration of this fact; for example, a man treated in a general hospital for an injured elbow might be discharged with the wound healed but with a crippled arm. Such a man would appear in the community as a cripple until he came under treatment for the restoration of his arm to a working condition. Another example might be seen in the instance of a child with a tuberculous hip; although the condition cleared up, a deformed hip was the result, necessitating admission to a hospital where the crippled condition might be remedied. Doctor Davis expressed the belief that nearly all cripples of a community could by proper treatment and education be made largely selfsupporting, and many entirely so. While this problem had always occupied the attention of the orthopedic surgeon the war had emphasized its importance to the people generally. He cited the fact that in the Widener Home for Crippled Children with which he was connected nearly all children going out from the home were occupying good positions. He decried the prevailing tendency of ignoring or absolutely refusing the cripple the chance to work even though he was qualified. While employers ought not to be asked to assume the added liability involved in the employment of the maimed in some of the industries he believed there should be some adjustment of this factor not yet provided for in the Workman's Compensation Act. Doctor Davis expressed his hopeful opinion, however, that the interest and efforts of the community would be directed with more earnestness than in the past to the reconstruction work for the civilian, as well as for the military and the industrial, cripple.

Dr. A. Bruce Gill, referring to the statement that experts must advise upon the matter of trades to

be taught the disabled, observed that such experts would be hard to secure, since the work discussed was in its very beginning. No evil, he said, was unmixed, and the opportunity for the cripple from this time would be such as it never had been before. There were at present, he said, but two comparatively small institutions in Pennsylvania devoted to the training of cripples for the industrial world, and but four States in the Union giving any State attention to the work. He emphasized the need for cooperation and study to equip and to find industrial positions for the cripples returned to us after the war. Already the war has shown employers that the cripple was capable of doing work heretofore refused him.

Dr. Charles K. Mills, referring to the special courses of training for military men given in the city, regretted that more thorough coordination had not been observed in organizing the groups, there being, for example, a neuropsychiatric, a neurosurgical, and an orthopedic group. The relation of orthopedic surgery to neurology he emphasized as of the highest importance. The first consideration in the treatment of cripples should be the diagnostic study. The surgeon should have a knowledge of the various conditions of the nervous muscular system, bones, and joints involved in disabilities. In the training of men for orthopedic work considerable study should be devoted to neural medicine. Many cases cited in the present war reminded him of the statements of Sir Benjamin Brodie and Sir James Paget that functional hysteria was not due to organic nerve injury, muscle, bone, or tendon, but to certain special conditions of the nervous system. Doctor Mills strongly emphasized the importance of diagnosis from a study of the nervous system as well as of the visible injury. Every orthopedic base hospital or reconstruction hospital should have a neurological member on its staff. He cited the Orthopedic Hospital and Infirmary for Nervous Diseases as instance of the advantage of combining surgical with neurological work. This great hospital with these coordinated branches brought about by the great neurologist, S. Weir Mitchell, with Dr. Thomas G. Morton, surgeon and honored officer, had accomplished a class of work not otherwise possible than upon these lines.

Major Silver, in closing, called attention to the fact that orthopedic surgery and reconstruction were not synonymous terms, and agreed with Doctor Davis upon the urgent need of provision for orthopedic work in general hospitals. The lack of such provision presented one of the most important industrial problems. The missing period, for instance, between a man's discharge from a hospital and his acquisition of atrophy from a disused injured member, must be studied and provided for. While the question of experts mentioned by Doctor Gill involved difficulty, yet any who had seen what could be done by amputated men would not ask for more finished experts; one such example was that of a man who had one arm amputated and who is now practising dentistry. In the reeducation of the crippled soldiers he felt that those essaying to give the instruction would be rather the ones who would be reeducated.

MEDICAL NEWS FROM WASHINGTON.

Rush: Endless Threats of Illness at Naval Training Stations—Work of the Laboratory of the Army Medical School with Typhoid and Paratyphoid Vaccines.

WASHINGTON, December 31, 1917.

Owing to the overcrowding of naval training stations as a result of the rush of those within the draft age to get into the navy before the time limit of noon, December 15th, the naval medical officers are apprehensive of disease epidemics. At this time, about 82,300 men are at the training stations. It was expected that, when these enlistments were made, many of the boys would spend the holidays at home and would not join until after January 1st, but few of them appear to have taken advantage of this opportunity, and there is a repetition of the old conditions of overcrowded barracks, with special reference to sleeping quarters. In the latter particular, the medical officers have been insisting that there should be a five foot individual sleeping space, which is regarded as a separation essential for the preservation of health in service dormitories. At the training station, Great Lakes, Ill., there are 22,000 men, for example, which necessarily produces congestion and prevents the application in an effective way of the detention system. For the present, the rates of admission to the naval hospitals are remarkably low, there being only twenty-seven cases of pneumonia and nine of cerebrospinal fever in the naval service.

An unusual case coming to the attention of the navy physicians recently is that of a radiooperator on board one of the small vessels. During a long watch, he undertook to heat the radio room by a charcoal stove. He apparently did not observe any unusual odor, and when the time came for his relief he was found unconscious on the floor. He died two days later of carbon monoxide poison. A dog also in the room at the same time, was found unconscious, but he fully recovered.

* * * * *

The laboratory of the Army Medical School at Washington, since April 1st, has shipped sufficient typhoid and paratyphoid vaccine to inoculate every man in the army against these diseases, and in addition it has made all the vaccines used by the navy since that date. In the six months between April 1st and November 1st, the laboratory has shipped 8,843,047 c. c. of vaccine. Enough typhoid vaccine has been shipped to vaccinate 1,051,604 men. Enough of the double vaccine, used to inoculate against paratyphoid A and paratyphoid B has been sent out to vaccinate 77,352 men. Since July 1st, when large scale production was begun of a triple vaccine used against all three diseases, typhoid and both of the paratyphoids, enough of this triple vaccine has been shipped to vaccinate 1,489,902 men. Each c. c. of the triple vaccine contains 1,000,000,000 typhoid bacilli and 750,000,000 of each of the two kinds of paratyphoid bacilli. The United States Army uses the Rawlings strain of typhoid bacillus, isolated by the British army from a case of typhoid at Netley, England, in 1900. The stock from which the typhoid vaccine is made is composed of lineal descendants of these germs isolated seventeen years ago and propagated in artificial mediums ever since. The paratyphoid vaccines are a combination of four strains, two American and two British.

Editorial Notes and Comments

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"CURES" IN MEDICINE.

The recent death of Dr. Andrew Taylor Still with his disciples affectionately called Old Doctor Still recalls a man who, whatever may be the ultimate conclusion as to the significance of his work, made a deep impression on medical practice in America in our generation. The inventor of osteopathy was nearly ninety years of age and had lived to see his system of treatment followed by many thousands of intelligent, educated physicians, thoroughly acquainted with the science underlying medicine and yet faithful to the practice of osteopathy. No one could organize a system of treating disease that is recognized by nearly all the States of the Union without having been a man of impressive personality at least and probably of ideas that were needed in his time. It is too soon as yet to attempt to say what shall become of his invention, for the greater father of medicine warned us that "life is short and art is long and conclusions difficult and human judgment fallacious." Perhaps the third generation may be able to say something about it definitely, though Professor Charles Richet, of Paris, once suggested that the therapeutics of

any generation is always absurd to the second succeeding generation.

All that can be said about osteopathy at the present moment is that, founded as it is on "cured cases," it is indeed built above shifting sands. As Oliver Wendell Holmes suggested in some of those charming medical essays which a preceding generation of physicians was accustomed to read much more frequently than is our generation, there has almost never been a mode of treatment no matter how absurd which has not been able to marshal its array of "cured" cases. Facts! facts! facts! they are called and enough of them are supposed to constitute proofs of the wonderful healing power of the therapeutic mode for which they bear witness. Oliver Wendell Holmes reminded the preceding generation that Perkins with his tractors and Mesmer with his battery—for Mesmer did not use what we know as mesmerism or hypnotism but a supposed wonderful electrical contrivance—both "cured" not hundreds but thousands of cases and "cured" them not in one country but in many, and by the same token made a good deal of money while doing so. It was the "cured" cases that brought them still further cases to be "cured" and so like an endless chain the success went on.

It made no difference that learned societies insisted that there was not an iota of electricity—they did not know the ion then—or any other marvelous force in the tractors, people went right on buying them and being cured by them and curing themselves and others with them. Galvani's experiments with frogs had just attracted attention to the possibility that electricity and nerve force might be merely modalities of some identical energy and therefore Perkins tractors caught the public attention. If Galvani with two different kinds of metals could cause a frog's leg to twitch, why should not Perkins with a series of metals incorporated into his tractors bring new life into paralyzed limbs and into muscles and joints that were disabled or chronically out of commission? Franklin was in Paris when Mesmer was making his cures and was asked to sit on the commission which investigated them and which decided that there was no electrical energy being used and no physical force of any kind, but Mesmer's cures went on in spite of this until the French Government asked him to desist and then he went over to England and worked a lot of "cures" there.

Every development in electricity that brought with it any novelty has always led to a new application of electrical apparatus to therapeutics and each new departure in this way has been followed by "cures."

When the Leyden jar was first invented it was carried round Europe and worked "cures" of all kinds. It unlimbered muscles, it rendered disabled joints active, it cured headache. Above all applied directly to the stomach it cured indigestion. The first Leyden jars were little affairs that we in our time would consider scarcely more than toys and yet they worked these effects. A little later magnets accomplished the same wonderful benefits for numbers of ailing people. A great astronomer and mathematician in Vienna made a series of magnets in the shape of various organs, liver, kidney, heart, and cured deep underlying diseases. It was from him that Mesmer got the idea which started him out on his career of "cures." Magnets did not come back again until, under hypnotism in Louys's hands, patients were supposed to see flames issuing from them and to be much affected by them in the later nineteenth century. This latter we know was pure fraud, but the former set of events is just one of those curious historical incidents which illustrate how cures fail.

Tuberculosis has been the great happy hunting ground for these cures, so that those of us who have seen at least one new cure for tuberculosis come and go each year for twenty years, appreciate thoroughly the expression of the old French physician who when asked by a younger colleague suffering from tuberculosis whether he should take this latest new remedy that was proclaimed a cure for consumption, replied promptly, "Oh, yes, and take it at once while it still doing good, for after a while we shall find that it does not cure any more." The hardest thing in the world is to appreciate properly the meaning of cures in medicine. The most important chapter in the history of medicine, at least of therapeutics, might well bear the title, "The Cures That Have Failed." Let us not forget that Dowie claimed to have cured over 100,000 people. I believe that he said 200,000, but we are conservative. Eddyism is founded on "cures." All the proprietary medicines obtain their vogue by the "cures" that they have effected. Here is what makes it so difficult to appreciate properly what will be the place that osteopathy and its founder will hold in the medicine of the future.

PHANTOM TUBERCULOSIS.

America was startled when it was reported that 86,000 soldiers had been discharged from the French Army during the first year of war on the ground that they were afflicted with tuberculosis. Calculations made upon this basis showed that France had a larger portion of tuberculous inhabitants than any other country in the world. A dis-

tinguished American physician came back with most alarming reports as to the prevalence of tuberculosis. The families of soldiers who have been ordered to France or expect to be ordered to France were terrified at the prospect of having their men submit to the danger of similar infection on such a vast scale in addition to suffering all the hardships and risks incident to trench warfare.

Our anxiety, however, seems to have been uncalled for. Major Edouard Rist, of the Medical Corps of the French Army, whose civilian life was devoted entirely to the study and treatment of tuberculosis, delivered a most reassuring message to the medical profession of the United States in the course of an address before the twenty-fifth annual meeting of the Association of Military Surgeons of the United States, which appears in the December issue of *The Military Surgeon*. During the whole of 1915 and half of 1916 Major Rist was in charge of a large hospital in the war zone and was consultant to a group of other hospitals in that zone. He was then sent to the United States to serve in the Office of the Surgeon General of the United States Army as a liaison officer in conjunction with Colonel C. U. Derclé.

When on duty at the front he found that many of the men who had been sent to the hospitals as suffering from tuberculosis showed no evidence of this disease on careful examination. On his suggestion all men sent back from the front with a diagnosis of tuberculosis with a history of coughing, hemoptysis, or pleurisy, were sent to a clearing station, of which he was put in charge. He made x rays of each of these cases himself, had the sputum, the throat, and the nose of each patient examined by a specialist, and kept each patient under observation for a week. As a result of this he was able to send back to the front many soldiers who would otherwise have been relieved of active duty and finally discharged on account of a mistaken diagnosis. He found that between eighty and ninety per cent. of these "tuberculous" soldiers were not tuberculous at all and he estimated that less than twenty per cent. of the 86,000 troops discharged during the first year of the war as tuberculous actually had tuberculosis.

In the majority of the cases where this mistaken diagnosis was made the patient had a cough. Some had a common cold, an acute rhinitis with a slight rise in temperature, or a loss of appetite, but there were no bacilli in the sputum, no definite dullness, and no tubular breathing, although some had bronchial râles. In these cases the fluoroscope showed perfectly transparent lungs. In nearly all there was some chronic infection of the upper air pas-

sages and more especially of the nasal cavities. Among these troubles were found chronic maxillary sinusitis, chronic purulent discharge from the ethmoidal cavities, hypertrophied turbinated bones, atrophic rhinitis, adenoids, deflected nasal septum, etc. These conditions have in many cases been so persistent as to be overlooked entirely by the patient, yet all have one symptom in common, coughing. It is to these conditions that Major Rist applies the very apt term of "phantom tuberculosis," which disappears when the nasal trouble is properly cared for.

Colonel George E. Bushnell, assistant to the Surgeon General and chief of the Division of Internal Medicine in the Surgeon General's Office, in a paper published in *The Military Surgeon* during the year, pointed out the frequent errors made in the diagnosis of tuberculosis and quoted statements made by Meissen, Roepke, and Müller showing the tendency on the part of German physicians to give a diagnosis of tuberculosis on uncertain and slight indications. It is most reassuring to find observers so competent as Colonel Bushnell and Major Rist protesting against the unnecessary alarm regarding the prevalence of tuberculosis in France.

WHO IS FEEBLEMINDED?

How many of our physicians are actually aware of the prevalence in every community of the mentally deficient needing special training and supervision in order that they may have a fair chance in the struggle and opportunity which make up existence? Without this supervision their handicap proves a weapon for their own destruction and a menace to the welfare and safety of society. The pressure of an earnestly inquiring and stimulating literature upon the subject is making its way into medical thought generally and denotes an interest abroad in society.

Yet too often the interest is content with the acceptance of a more or less superficial, static, and rigid attitude toward these problems, sincere and genuine enough as a beginning, but dropping too easily into an unconsciously indolent inefficiency under cover of these apparently technical and scientific partial efforts and results. Psychological tests, intellectual measurements, gradings and classifications based upon them, must necessarily be only the beginnings of a work destined to reach far beyond them, to become far more complex as well as far more profound, if human material is to be reached, understood, and helped out in its building up process to a workable measure of health and efficiency.

The chapter entitled Who Is Feeble-minded?

in a new book by J. E. Wallace Wallin [*Problems of Subnormality*, World Book Company, Yonkers-on-Hudson] severely arraigns the inaccuracy and the superficiality of the present methods employed in the problems involved. Doctor Wallin criticizes most of all the slipshod use of the term feeble-minded. In the first flush of social interest in the discovery and aid of this class which has roused social endeavor, the term has been too widely applied and insufficient tests and classifications have been made. Simple retardation, special defect, lack of educational advantages even, have produced conditions which may be detected and brought under this one heading, according to the limited test scales generally in use, and the likewise limited training of too many so called psychological workers who are using them.

The value of certain guiding tests, such as those of Binet-Simon, is undeniable, but within definite restrictions, such as their original authors plainly saw and acknowledged. Such an absolute dependence upon them as their advocates would seem to indicate would include in the feeble-minded grade many who are leading quiet, industrious lives, efficient and progressive according to their station in life, and capable of caring for themselves and producing healthy and efficient children. Among those who need educational help other than the ordinary work of the schools it results in improper assortment of pupils and classes and lack of facilities for aid in many cases. The distinctions must be made for those actually feeble-minded and mentally incapable of more than a certain degree of training, and those who merely are the victims of a certain retardation, special defect, or other removable obstacle, or one which can in some way be compensated. This is too great a task to put upon teachers, those in charge of education, or psychological workers, who too often are trusted as "experts" with this difficult task, which is beyond their actual scope.

The question of the necessary arrangement and grading of the educational work is too important for society and the individual who is in need of this help to be conducted thus. The problem from all sides is emphatically a medical one. Any partial defect certainly needs medical detection and attention and more accurate educational rating which must have medical opinion as a basis. How much more does the actual separation of these from mental defectiveness in all its grades and the recognition and diagnosis of the varying grades and forms of the latter condition belong only with the specially trained physician? The

valence of the individual and the sound and healthy attitude of society is too profound a problem and too entirely one of psychical and neurological as well as general somatic technicality to be finally entrusted to any one but the well qualified physician. Let the physician, however, also remember that this demands of him special training and one which does not exclude a grounding in psychological questions and an appreciation of them.

THE UMBILICOMAMMILLARY TRIANGLE.

Whether it is true or not, Dr. George Elliott, in the December issue of the *Dominion Medical Monthly*, asserts that the largest triangle on the surface of the human body has entirely escaped notice at the hands of anatomists and clinicians. This triangle with its apex at the umbilicus and the base line drawn between the two mammillae incloses a surface which presents a very clear and readily remembered picture with the important structures which lie beneath.

The apex of the heart lies one fourth the distance down the left line of the triangle; just above the base line, a little to the left of its centre, the mitral valves; in the left angle of the base line and the middle line, or height, the tricuspid valves; the cardia, a third the distance down the middle line and to the left; the pylorus, a third the distance up from the umbilicus and to the right; the fundus of the gallbladder, a third the distance up the right line from the umbilicus and an inch to the right. Should these markings prove to be accurate or as nearly accurate as those generally given it would be a much easier way for the student to remember them, in fact he could scarcely ever forget them, and as equally easy for the clinician. Possibly surgeons could locate their incisions for various operations in that region as well by this conspicuous triangle.

THE MEDICAL EXAMINER REPLACES THE CORONER.

The New Year brings a new government for the City of New York and one important change affects an old established institution. The Board of Coroners give way to the Board of Medical Examiners. Under the old law, the chief coroner, or his assistant, on notification of a suspicious death, made an examination of the case and, if circumstances indicated, directed that an autopsy be held. The findings of the coroner in the case were made the basis of an inquest by the coroner who exercised the functions of a magistrate at this inquest and either committed the suspected murderer for trial or released him as the evidence warranted. Under the new law, the judicial functions of the coroner are entirely done away with and his successor, the medical examiner, is purely a medical examiner testifying to the facts ascertained in the examination at a hearing before a magistrate. The new law requires that the medical examiners shall be graduates of medi-

cine and expert pathologists and microscopists. The incoming mayor has appointed as chief medical examiner Dr. Patrick D. Riordan, who has been at the head of the Board of Coroners for the past four years. Doctor Riordan, who is a graduate of the Homeopathic Medical College, New York, was engaged in the practice of medicine prior to his assuming the duties of coroner and comes within the provisions laid down as to the qualifications for holding the office of medical examiner.

Obituary

THEODORE C. JANEWAY, M.D., M.D.,
of Baltimore,

Major, Medical Reserve Corps, U. S. A.

Major Theodore C. Janeway died at his home in Baltimore, Md., on December 27th, from pneumonia. Major Janeway was born in New York, on November 2, 1872, the son of the distinguished diagnostician, Dr. Edward C. Janeway. He was graduated from Yale College with the degree of bachelor of philosophy in 1893 and took his medical degree at the College of Physicians and Surgeons in 1895. He was instructor and lecturer at the medical school of the New York University for several years. Later he became associate professor and in 1909 professor of medicine in the medical school of Columbia University. In April, 1914, he accepted the chair of medicine at Johns Hopkins University, succeeding Sir William Osler and Dr. Lewellys F. Barker. In 1907 he became secretary of the Russell Sage Pathological Institute and in 1911 became one of the scientific directors of the Rockefeller Institute for Medical Research. It was largely through Doctor Janeway that a closer affiliation was established between the Presbyterian Hospital and the College of Physicians and Surgeons, Columbia University. He published a book entitled *The Clinical Study of Blood Pressure* which added much to his reputation. Early in the war he joined the Medical Reserve Corps and was given the rank of major and put in charge of the section on cardiovascular diseases of the Division of Internal Medicine at the Surgeon General's Office. Associated with him in this work was Major Warfield T. Longcope, M. R. C., who had succeeded him as Bard professor of medicine at Columbia University. At the Surgeon General's Office he was charged with the organization of special boards of experts in the diagnosis of diseases of the heart and bloodvessels, and with the selection of internists as chiefs and assistants for the medical service in hospitals. He was also active in the elaboration of plans for special hospitals both in the United States and overseas for the treatment of cardiovascular diseases. Major Janeway was a member of a number of medical organizations among which were the American Medical Association, the Association of American Physicians, the Society for the Exploitation of Biology and Medicine, and the American Society of Advanced Clinical Investigation. In 1899 Major Janeway married Eleanor C. Alderson, of Overbrook, Pa., who survives him.

JOSEPH PRICE REMINGTON, PH. M.,
 PHAR. D., F. C. S., F. L. S., F. R. M. S.,
 of Philadelphia.

Professor Joseph Price Remington, chairman of the Committee of Revision of the United States Pharmacopœia and dean of the Philadelphia College of Pharmacy, died at his home in Philadelphia, on January 1st, at the aged of seventy years. Professor Remington was born in Philadelphia on March 26, 1847, his parents being Dr. Isaac and Lydia Hart Remington. He was educated at the Philadelphia Central High School, took the degree of Ph. G. from the Philadelphia College of Pharmacy in 1866, and was later given the honorary degree of master of pharmacy from the same college and of doctor of pharmacy from the Northwestern University of Chicago. He was elected professor of pharmacy in the Philadelphia College of Pharmacy in 1874 and dean in 1893. He has been a member of the Committee of Revision of the United States Pharmacopœia since 1880 and chairman since 1901. He was the president of the first International Pharmaceutical Congress, held in Brussels in 1893, and has been a delegate to each of the international congresses held since that time; he was also a delegate from the United States to the Pan-American Medical Congress in Washington in 1893 and to every succeeding Pan-American medical Congress. He was an honorary member of twenty-eight foreign and American pharmaceutical and medical associations. He was the author of *Remington's Practice of Pharmacy*, the first edition of which appeared in 1886, and was editor of the *United States Dispensatory* since 1883 and pharmaceutical editor of *Lippincott's Medical Dictionary*.

News Items.

Tuberculosis and the War.—On Sunday morning, January 13th, the National Jewish Hospital for Consumptives, at Denver, Col., will hold its annual meeting at the Savoy Hotel, New York. Following the meeting, at 3 o'clock in the afternoon, a conference will be called to discuss Tuberculosis and the War. At this conference addresses will be made by Miss Jane Addams, founder of Hull House, Chicago; Dr. Hermann M. Biggs, New York State Commissioner of Health; Dr. Charles J. Hatfield, secretary of the National Association for the Prevention of Tuberculosis, and others.

Meetings of Medical Societies to Be Held in New York During the Coming Week.—Monday, January 7th, Clinical Society of New York Throat, Nose, and Lung Hospital, German Medical Society of the City of New York, Brooklyn Hospital Club, Clinical Society of the New York Polyclinic Medical School and Hospital, West Side Physicians' Economic League; Tuesday, January 8th, New York Academy of Medicine (Section in Neurology and Psychiatry), New York Obstetrical Society; Wednesday, January 9th, New York Pathological Society, New York Surgical Society, Alumni Association of Norwegian Hospital, Brooklyn, Medical Society of the Borough of the Bronx (annual), Richmond County, N. Y., Medical Society, Brooklyn Medical Association (annual); Thursday, January 10th, New York Academy of Medicine (Section in Pediatrics), West Side Clinical Society, New York, Brooklyn Pathological Society; Friday, January 11th, New York Academy of Medicine (Section in Otolaryngology), Society of Externs of the German Hospital in Brooklyn, Flatbush Medical Society, Brooklyn, Eastern Medical Society of the City of New York, Clinical Society of the German Hospital, Manhattan Dermatological Society.

The New Administration.—New York's newly elected mayor has announced the appointment of Dr. Patrick D. Riordan, former chief coroner of the city, as chief medical examiner, but has made no announcement as regards the appointment of a health commissioner. The present commissioner, Dr. Haven Emerson, therefore, will hold office until his successor is appointed.

Women Nurses on Hospital Ships.—Women nurses are to be employed on hospital ships for the first time in American history. They will be assigned to two ships soon to be ready for service, the *Comfort*, formerly the Ward liner *Avana*, and the *Mercy*, formerly the *Saratoga*, of the same line. Both liners have been remodeled and fitted with accommodations for 300 patients each, with special quarters for the women nurses.

Medical Unit to Be Sent to Palestine.—The Zionist organizations of the United States are planning to raise money to send a medical unit to Palestine. Attention must be given at once to the medical and sanitation problems in that country for fear of epidemics incident to the war, and in the constructive work which is being planned by these organizations it will be necessary to have experts make a survey of the conditions. It is believed that about \$100,000 will be needed to carry on the work.

New Foundation Chartered Modeled on the Rockefeller.—John Emory Andrus, former mayor of Yonkers, has established the Surdna Foundation, through which he expects to give his millions to charity. The Surdna Foundation, which takes its name from the reversed spelling of Mr. Andrus's name, is modeled after the Rockefeller Foundation in its general plan. The certificate of incorporation states that the object of the foundation is "to donate or contribute anything or everything to any corporation, association, and organization for religious, charitable, scientific, educational, or eleemosynary purposes."

Personal.—Among the recipients of British New Year honors is Dr. Andrew MacPhail, professor of the History of Medicine at McGill University, Montreal, who has had knighthood conferred upon him. Doctor MacPhail is at present a captain in the Canadian Army Medical Corps serving in France.

Announcement is made that Medical Directors George H. Barber and Edward R. Stitt, of the United States Navy, are to be promoted to the rank of rear admirals in the Medical Corps of the Navy. Doctor Barber is a specialist in tuberculosis and for several years was head of the naval hospital at Las Animas, Colo. Doctor Stitt is president of the Naval Medical School at Washington, and is an authority in tropical medicine.

Dr. Katharine Bement Davis has been appointed general secretary of the bureau of social hygiene of the Rockefeller Foundation. She is credited with having suggested to John D. Rockefeller, Jr., the plan which led to the establishment of the bureau. Doctor Davis was appointed Commissioner of Correction by Mayor Mitchell in 1913, and became chairman in 1915 of the new parole board organized to provide machinery for indeterminate sentences.

Narcotic Hearing Continues.—The joint committee of the Legislature of the State of New York continued its hearings during the past week at the mayor's office. Among those who appeared were Dr. Walter J. Conley, in charge of the narcotic ward of the Metropolitan Hospital; Dr. Perry M. Lichtenstein, physician to the Tombs Prison; Albert I. Unger, deputy assistant district attorney; Police Lieutenant Sherb, in charge of the narcotic squad of the city police; Richard H. Yancy, United States Government narcotic inspector; Cornelius F. Collins, judge of the Court of Special Sessions and chairman of the consolidated committee of the State Magistrates' Association; Edwin M. Stanton, assistant United States attorney; Lucius P. Brown, chief of the drug division of the Board of Health of the City of New York; Charles Samson, executive secretary of the Warwick Sanatorium; Dr. George E. Pettey, of Memphis, and William McAdoo, chief magistrate of the City of New York. Senator Whitney, who is the chairman of the committee, states that he will shortly begin an investigation to determine (1) whether men high in the medical profession have received monetary consideration for the use of their names in indorsing an advertisement of "cures"; (2) whether worthless "cures" have been foisted on the State by these men for advertising purposes.

Modern Treatment and Preventive Medicine

A Compendium of Therapeutics and Prophylaxis, Original and Adapted

TREATMENT OF ACUTE MERCURY BICHLORIDE POISONING.

By LOUIS T. DE M. SAJOUS, B. S., M. D.,
Philadelphia.

(Continued from page 1235.)

Some clinical as well as experimental evidence has already been presented in support of the view that with the newer chemical antidotes for mercury bichloride taken internally, definite results as regards protection from the poison may be expected, providing the interval between ingestion of the poison and antidote does not exceed ten or fifteen minutes, and likewise providing gastric lavage is duly carried out to prevent subsequent gradual absorption. The ease with which mercury enters the blood, however, and its peculiarly pernicious action on the kidneys, render advisable prompt measures for the protection of these organs even where neutralization or removal of the greater part of the poison taken is believed to have been effected. While A. W. Burton in 1911 reported a case of poisoning by forty-four grains of bichloride taken after a meal, in which absorption was so delayed that the existing gastritis cleared up before the symptoms of general intoxication—ultimately fatal—set in, such tardiness of poisonous action is exceptional and, as already pointed out in relation to the experiments of Schamberg and his coworkers, definite pathological changes in the renal tubules may be noticed within twelve hours after administration of a fatal dose of bichloride.

Measures calculated to minimize injury to the kidneys, and hence reduce one of the chief dangers in bichloride poisoning, comprise not only those which accelerate elimination of the poison through other channels of excretion, but also procedures operating directly upon the renal parenchyma. If one is properly to appreciate the latter group of measures, certain conditions existing in the kidney tissues intoxicated by mercury must be borne in mind. As was noticed in the experimental investigations of Schamberg, Kolmer, and Raiziss, the earliest changes in the convoluted tubules, the renal structures first involved in the intoxication, consist of swelling and fragmentation of the lining cells, together with clouding and varying degrees of degenerative changes in the nuclei. In animals succumbing in a few days, edema of the tubules in the cortical portions was pronounced. Now in renal cloudy swelling in general, including that of bichloride intoxication (McFarland), it is believed that the enlargement of the affected cells may be sufficient to produce a local anemia and hence reduction of the urinary function, through pressure upon adjoining capillaries. According to Fischer's conception of the pathogenesis of nephritis, the swelling of the cells may be presumed to be due to an acid condition of their contents, the acid condition resulting, in turn, from an asphyxia of the affected cells through the direct toxic action of the mercury upon them. It has been suggested, moreover, that excessive ab-

sorption of water by proteins may occur from causes other than acids. Upon these considerations is based the new direct treatment of mercurial nephritis by agencies intended both to remove the excess of water from swollen kidney cells and to neutralize the acidity which has been deemed to promote the absorption of this excess of water by the cells. Salts acting as dehydrants and alkalies constitute these agencies. Even a prophylactic influence on their part in beginning intoxication may be conceived of, the prevention of swelling of the cells of the tubules tending to obviate the oliguria arising through pressure upon the renal capillaries. Clinical results obtained with measures of this type already seem to justify their application as a rational mode of treatment.

S. W. Lambert and H. S. Patterson, 1915, have recommended a series of measures utilized by them in ten cases, with uniform recovery. After preliminary treatment with the whites of several eggs and thorough gastric lavage, the stomach contents are, upon arrival of the patient in a hospital, examined for mercury, the stomach again thoroughly washed, and a pint of milk given. The lavage is repeated after an hour if vomiting has not been allayed by the former washing, and as soon as the stomach has been quieted, a renal dehydrant and diuretic treatment is begun, eight ounces of the following mixture being ingested at alternate hours: potassium bitartrate and sugar, of each one dram; lactose, one half ounce; lemon juice, one ounce; boiled water, sixteen ounces. Both the bitartrate and the sugars, besides acting as diuretics and tending to wash out some of the poison, are considered to extract water from already swollen renal cells, or at least, to inhibit absorption of excess of water by cells not yet enlarged. Retention of wastes in the bloodstream from deficient eliminative power in the later stages of renal intoxication is, of course, likewise antagonized owing to the increased output of fluid. In addition to the mixture to be taken by mouth, Lambert and Patterson administer a solution of potassium acetate, one dram to the pint, continuously into the rectum by the drop method. Like the bitartrate, the potassium acetate tends to dehydrate the involved renal cells and act as diuretic. Through these measures the urinary output may at first increase up to 130 or more ounces in twenty-four hours. During the period of most powerful toxic action it will then decrease, and may almost cease; on the whole, however, the effects of the intoxication are evidently reduced by the treatment, and the mortality correspondingly lowered. The most critical stage having been passed, excretion rises again to a figure sometimes even higher than the maximum previously recorded.

Other features of the Lambert and Patterson treatment include gastric lavage twice daily, mercury having been regularly detected by these observers in the stomach for several days after ingestion of the poison. At least part of this mercury is held to have been secreted by the stomach in an attempt

to eliminate it from the body. The colon is also irrigated twice a day, to wash out any of the poison excreted into the bowel, and the patient is given a daily sweat by means of a hot pack. According to Fischer, 1915, sweating in nephritis is beneficial not only through the toxic material actually thus eliminated but also through the dehydration of renal epithelium resulting from the extensive loss of fluid out of the system at large. Thus, in the treatment referred to, a number of procedures designed to prevent the mercury from crippling the renal function are placed simultaneously in operation.

(To be continued.)

Reduction of Gastric Acidity.—Edmund Jacobson (*Journal A. M. A.*, November 24, 1917) discusses the rôle of sodium chloride in providing the hydrochloric acid of the gastric juice and reviews the previous attempts to reduce the acid production by reduction in the intake of this salt, or its total elimination from the diet. This work showed very unsatisfactory results, both experimentally and on man, but it is now known that much of the reason for this lay in the fact that the diets chosen were devoid of the essential vitamins. It was also shown that there were large stores of chloride in the body which would continue to provide for the secretion of acid for a considerable period of time after a chloride free diet had been instituted. Recent animal experiments by the author show that in dogs it is possible to reduce greatly the acidity of the gastric juice by a chloride free diet, containing vitamins and otherwise properly balanced, combined with the frequent aspiration of the gastric juice to prevent the reabsorption of the chlorides and their repeated utilization. It is suggested from these experiments that the proper line of attack in man would be to give a diet free from sodium chloride, but otherwise well balanced and suited to the special conditions to be met, and to provide other salts to take the place of the chloride, both for the sake of the taste and also to aid in the elimination of the chlorides. Such a salt mixture is the following:

Dicalcium phosphate,	5.8 gm.;
Monomagnesium phosphate,	3.4 gm.;
Dipotassium phosphate,	7.7 gm.;
Potassium citrate,	1.7 gm.;
Sodium citrate,	7.4 gm.;
Calcium lactate,	4.0 gm.;
Mix and pulverize.	

These are the salts found in milk and are present in about the same proportions, except that calcium lactate is substituted for the chloride. This mixture is also suitable for use in the salt free diet for nephritis. Among the important articles of diet which may be given are fresh meat, potatoes, oatmeal, carrots, and cauliflower. These should be cut fine and boiled for hours with several changes of water. Apples, prunes, apricots, very weak tea or coffee, salt free butter, one egg, and fifty mills of milk or cream a day may also be allowed. Distilled water should be used for drinking. It is to be anticipated that ten or more days may be required before such a diet will produce any marked reduction in the gastric acidity. If possible in ulcer cases more or less frequent aspiration of the gastric juice should be practised to hasten the reduction in the chlorides

Quinine and Urea in the Treatment of Hemorrhoids.—E. H. Terrell (*Journal A. M. A.*, November 3, 1917) has employed this remedy in a total of 313 cases without a single failure where the treatment was thoroughly carried out. The cases in which it is suitable are limited to those with chronic internal hemorrhoids which protrude and bleed. Other types must be treated by other methods. The method of using the quinine and urea is to expose the hemorrhoid through a Brinkerhoff anal speculum, cleanse it with alcohol and iodine, and then inject into it enough five per cent. quinine and urea solution to distend it slightly. The injection must be made through and not into the mucous membrane to avoid sloughing. The needle used should be very fine and it should be inserted as far from the skin margin as possible. The hemorrhoids are injected, one each day until all have been injected. Then a treatment is given once each week on alternate sides until the case is cured, that is each side is injected every two weeks. The treatment usually lasts about six weeks. The treatment is almost devoid of pain and there is little or no pain following it. The sphincters are not dilated and the patient is allowed to continue his usual occupations. In resistant cases it may be necessary to use a ten per cent. solution. The injection promptly relieves both the tendency to prolapsus and hemorrhage and results in a fibrosis and contraction of the hemorrhoid.

Carcinoma of the Prostate.—Hugh Hampton Young (*Journal A. M. A.*, November 10, 1917) describes and illustrates in detail a modification of his earlier method for the radical excision of carcinoma of the prostate with preservation of the urinary control. With the patient in exaggerated lithotomy position, the penis injected with a five per cent. argyrol solution, and a No. 24 sound passed into the anterior part of the prostatic urethra, the perineum is then cleaned with tincture of iodine and an inverted V incision is made in the perineum. The space on either side of the central tendon is opened up by blunt dissection, a bifid retractor is introduced, the central tendon divided, and the rectourethralis is incised longitudinally on the sound. The edges of the mucosa are picked up, the prostatic extractor introduced, and the posterior layer of Denonvillier's fascia is divided. The posterior surface of the prostate and seminal vesicles is freed by passing up between the posterior and anterior layers of this fascia, and the lateral surfaces of the prostate are exposed by blunt dissection. The membranous urethra is next divided just in front of the prostatic tractor. With the prostate drawn downward a scalpel is plunged through the bladder close to the upper limit of the prostate and a curved incision is made across the trigone about one centimetre below the openings of the ureters and including the whole bladder wall. The vasa deferentia are then freed, clamped, and cut. The entire mass, including prostate, vesicles, and parts of the trigone, the membranous urethra and the vasa, is removed. The bladder is then drawn down and anastomosed to the stump of the membranous urethra, the remaining gap closed, and the wound sutured in layers. A catheter is tied into the urethra and the remaining treatment is like that adopted for perineal prostatectomy.

Treatment of Painful Shins Following Trench Fever.—Alfred J. H. Iles (*British Medical Journal*, October 13, 1917) has secured promising results in the prompt alleviation of pain and the permanent cure of this distressing condition by the combined use of ionization and faradization. The treatment consists in painting an area of the skin over the affected part with tincture of iodine, to the extent of one and a half inches in width and three in length. This area should lie outside of and parallel to the anterior border of the tibia in the middle third of the leg. The area is then ionized from the negative pole for ten minutes, using ten milliamperes as the maximum current. The pad under the negative electrode should be thick and well saturated with a solution of two per cent. sodium salicylate in three per cent. sodium chloride. On the second day the area is ionized with sodium chloride alone, also using the negative electrode. No further ionization is given, but the muscles of the calf of the leg are exercised daily by the faradic current. Under this treatment the average stay of the patients in hospital was reduced to seven and a half days and ninety-eight per cent. of the men were sent to convalescent depots for return to active duty.

Acidosis, Especially in Diabetes.—Albert H. Rowe (*California State Journal of Medicine*, November, 1917), after a rather full discussion of acidosis and its diagnosis, insists that in beginning the treatment of a diabetic it is most important to investigate thoroughly the power of elimination of acids by the body. A routine ferric chloride reaction, ammonia determination, a determination of the alveolar carbonic dioxide tension, or better of the carbonic dioxide tension of the plasma, should be made, and as acidosis may develop during fasting, these investigations should be continued throughout the treatment. The aim should be to prevent, rather than to treat, acidosis. Several measures found useful in doing this are given: 1. The source of supply of acid bodies is eliminated by cutting out the fats from the diet and gradually eliminating the proteins and finally the carbohydrates. This procedure is particularly useful in the obese, in diabetes of long standing, in patients with damaged kidneys, in children not accustomed to fats, in cases of infection, and in operative cases. 2. Acidosis can be prevented if the patient's tolerance for carbohydrates can be improved. 3. To prevent acidosis in very fat individuals a great weight reduction is often necessary, thus doing away with the fat from which acid bodies might be derived. 4. The question whether alcohol is useful to prevent acidosis when given during fasting is unsettled. 5. In building up the diet after the fasting period acidosis can be prevented by the inclusion of as much carbohydrates as the patient can stand without a return of sugar in the urine. When moderate acidosis is present, as determined by complete laboratory tests, the following measures may help to dispel it: 1. Fasting. In using this method the alkali reserve of the blood should be closely watched for some cases of acidosis are aggravated by fasting. 2. Feeding of carbohydrate protein diet. When acidosis is found by laboratory analy-

sis to increase with fasting, the feeding of green vegetables and small amounts of protein is indicated. 3. Intermittent feeding and starvation. 4. Weight reduction. 5. Increase in diet. Alkali should be given only when the laboratory tests show danger of approaching coma, i. e., more than 2.5 grams of ammonia and a carbonic dioxide tension of thirty millimetres of mercury. If the danger is slight, only small doses should be given until the carbonic dioxide tension has been definitely raised. The danger of too large doses of alkali is emphasized, but it should be given when coma is threatening. In the treatment of coma the credit of the following is given to Joslin. He lays stress on putting the patient to bed and keeping him warm and at rest. Bowels should be emptied. Elimination of acid bodies should be encouraged by a large fluid intake by mouth and colon and, if necessary, intravenously. A large amount of alkali should be crowded into the patient, preferably by the mouth, but if this is impossible, intravenously. Digitalis and caffeine should be given to support the heart and morphine to control the nerves.

Untoward Effects of Emetine Hydrochloride.

A. Alatici (*Paris médicale*, October 13, 1917) states that in some cases of amebic diarrhea administration of emetine causes at first, or even throughout the treatment, an increase in the number and size of the bowel movements, distinct benefit appearing only two to eight days after termination of the course of injections. Ampoules of the drug prepared a number of months before use were observed to be less active and to cause local inflammatory reactions more frequently than freshly prepared solutions. Nausea and vomiting appeared in some cases after the second or third daily dose of 0.08 gram. Toward or after the close of a series of injections, low blood pressure and impaired cardiac power was noted in all the author's cases of emetine intoxication, numbering nine out of 220 cases treated. At times cardiac insufficiency appeared suddenly, and in one instance of this type death in collapse followed. In three cases of fatal dysenteric cachexia, rebellious to emetine, persistent tachycardia and embryocardia appeared four to eight days after the close of a series of emetine injections and are believed possibly attributable to the drug. In each of these three cases, expectoration of 500 to 600 grams of clear fluid, mucous secretions daily had been noticed before the beginning of the cardiac disturbance. In two cases there were superadded paroxysms of inspiratory spasm resembling a prolonged hiccup. The patient, sitting up in bed with the mouth wide open, strove vainly for twenty or thirty seconds to complete the respiratory cycle by expiration. Paresis of the muscles, especially of the neck or lower limbs, dysphagia, and distinct persistent trismus were noted in a few cases. Impairment of urea elimination through the kidneys was shown by studies of Ambard's quotient to be a very frequent effect of the drug. Of sixteen patients receiving over one gram of emetine within thirty to thirty-five days, seven showed toxic symptoms immediately or within a week after the conclusion of treatment. Apparently one gram is the maximum safe dose in a month's time.

Muscular Headaches.—William Mithoefer (*Ohio State Medical Journal*, November, 1917) concludes that anything that will diminish the hypertonic state of the muscles of the neck will relieve the headache. Massage is the best treatment at our command. Mild cases are usually relieved after a few massages. Chronic cases may require from forty to sixty treatments. The technic is to have the patient lie on the side in the recumbent position with the arms extended. A lubricating jelly is now applied to the skin of the forehead and neck. Longitudinal and transverse massage are applied to the muscles of the neck. Massage should not be carried on oftener than two or three times weekly. These patients should be made to walk from three to five miles daily. As an adjunct to the massage a treatment with high frequency current may be used once or twice a week.

Tetanus in Court Plaster.—C. W. McCoy, J. P. Leake, and H. B. Corbitt (*Public Health Reports*, Reprint No. 424, September, 1917) report the results of the bacteriological examination of fourteen specimens of court plaster. The work was undertaken because of the publicity given to alleged intentional contamination of court plaster with tetanus. In none of the specimens examined was there evidence that they had been deliberately contaminated, nor was there clear proof that the court plaster harbors the organism of tetanus as it leaves the manufacturer, but it was found that when the plaster reaches the user the organism may be present. The first specimen examined came from a State department of health. While working on this sample there were indications that tetanus was present, so thirteen additional specimens were purchased from local pharmacies. By careful bacteriological examination and animal tests, the tetanus germ was proved to be present in two of these specimens.

Infantile Diarrhea.—W. F. Litchfield (*Medical Standard*, November, 1917) is of the opinion that well diluted alcohol should be given freely through the acute stage of this disease. A brisk purgative, such as a dose of castor oil, should be given early. The old plan of a continuous and gentle purgation seems to him the best one, and for this purpose there is nothing better than one of the mercurials: one sixth to one quarter grain gray powder every four hours; one half to one sixth grain calomel every four hours. Some prefer ten to twenty drop doses of castor oil every four hours, or ten grain doses of epsom salts every four hours.

Opium should not be given as a routine, but when there is much pain, restlessness, and straining small doses of Dover's powder, one twelfth to one sixth grain or tincture of opium, one sixth to one half minim, may be given every four hours as a temporary measure. The value of bismuth is not easy to estimate; it may be given with gray powder, calomel, or epsom salts. In conjunction with twenty minims of castor oil three times a day the following may be given as a routine treatment:

R Bismuthi salicylatis,℞. ʒ;
 Pulvis acacie,℞. ʒ;
 Aqua cinnamon,ʒij.

Misce. Signa: Two drams every four hours.

Hot cloths are useful for colic; hot packs or baths may be used to induce sleep when there is much

restlessness. When the movements are very frequent, washing out the bowel with warm saline solutions relieves some of the distress. Small starch enemata may be used when the stools are dysenteric in character. For some hours after the onset nothing should be given by mouth except water. Excessive thirst may be slaked by frequent small drinks of cold water. Children on the breast should not be taken off, except for a few hours, or until the vomiting ceases, as breast milk seems to be the best food. In other cases he judges whey to be one of the best things to give in the early stages of the disease, and considers white wine whey an excellent preparation. Albumin water, to which barley water, sugar, brandy, lime water, and cinnamon water may be added in suitable proportions, is another good food. When exhaustion sets in, the first thing necessary is to get the child to sleep, which is best done in the open air in a cool place. Rested in this way the child will take a little food from time to time, but no food should be forced. Food should be given infrequently at four to six hour intervals. If wasting continues there is a fault of assimilation, which may have to be dealt with by cutting out fats or carbohydrates or by giving a mixture of carbohydrates. It may be necessary to try a variety of foods.

General Treatment of Gonococcal Infection.—S. Mélamet (*Bulletin de l'Académie de médecine*, October 16, 1917) believes the antagonistic action of potassium permanganate to be due to the manganese it contains, and reports seventy-two cases in which the permanganate or colloidal manganese was administered by intramuscular injection with the aim of destroying the gonococcus not only in the urethra but throughout the system. The three permanganate solutions used contained respectively 1.66, 2, and 2.66 mgm. of the salt in a mil of distilled water. In acute urethritis, daily injections were made into the buttock, beginning with two mils of the first solution, then increasing the dose by one mil every three days up to five mils, next giving two mils of the second solution for three days, increasing up to five mils, and finally using the third solution and stopping at the three mil dose, except in rebellious cases. In acute urethritis with complications, or chronic urethritis, the second solution was used immediately in two mil doses, gradually increased to three or five mils of the third solution, according to indications. The treatment was continued until the symptoms disappeared, or a few days longer. The colloidal treatment, where used, consisted in daily injection of the contents of an ampoule of manganese colloidiase or electric manganese. In most cases the injections caused localized burning but usually this passed off in five or ten minutes, though occasionally recurring in less degree after four or five hours. No urethral treatment was used. Successful results with the treatment were obtained in sixty-five out of seventy-two cases. Among twenty-seven cases of simple acute urethritis treated with the permanganate, results were good in all but five. The average number of injections to a case was twenty-five to fifty. The treatment was successful in seventeen out of eighteen cases.

Posterior Urethritis.—C. H. Solomon (*Urology and Cutaneous Review*, November, 1917) orders rest, warm sitz bath, and regulation of diet in acute cases. Where there is frequent and urgent urination and the prostate is large and tender, treatment should be limited to the mouth and rectum. By mouth salol, sandalwood oil, and urotropin should be given. If the urine is strongly acid and the infection is due to other germs than the pneumococcus an alkaline mixture may be given. By rectum belladonna, opium, and hyoscyamus in the form of suppositories should be given. In the chronic cases local treatment to the posterior urethra, prostate, seminal vesicles, and anterior urethra should predominate. Give instillations of two drams of protargol 0.25 to 0.5 per cent. once in every twenty-four hours with massage of the prostate through the rectum once every four or five days. Five per cent. silver iodide in olive oil emulsion and five to 10 per cent. argyrol or silvol can be used. Silver nitrate is too irritating. The passage of large calibre sounds, 28 to 32 French, or dilatation of the posterior urethra with the curved dilator help these cases. The urethroscope is useful. Twenty to twenty-five per cent. silver nitrate or carbolic acid may be applied with applicators every four to seven days, or fifteen per cent. copper-sulphate solution in glycerin. Cauterization by means of electricity or chemicals or amputation of the verumontanum has given good results in the type of cases termed sexual neurasthenia. The vaccine treatment has not proved to be of value.

Medical Management of Peptic Ulcer.—William S. Knox (*Medical Sentinel*, November, 1917) says that the sole object of medical treatment is to render the gastric juice alkaline and to keep it so from early morning until late at night. This is accomplished by means of feeding the patient each hour from 7 a. m. to 9 p. m. and midway between each feeding administering alkali nitrate in sufficient doses to neutralize the acidity of the individual case. Late in the morning and in the afternoon and evening the stomach is aspirated and the contents analyzed to determine whether or not acidity is being controlled. If free acid is discovered the amount of alkali is increased correspondingly until absolute control of the case is obtained. If distress or burning is felt during the night, the stomach is emptied of any secretions it may contain and alkali again administered. The diet while under control consists mainly of milk and cream, cereals, eggs, and soups. The patient must remain in bed for from three to six weeks, preferably in an institution. Ambulatory treatment is doomed to failure and should never be attempted. Since no two cases will behave in just the same way, constant vigilance over the gastric secretions by means of the stomach tube cannot be relaxed; if it is neglected the patient is subjected to a hit or miss chance for recovery. No detail can be omitted and the many failures encountered represent, ninety-nine times out of a hundred, failure to adhere to the strict rules of the game. Knox is of the opinion that an ulcerated duodenum or stomach will heal spontaneously if given out half a chance. Even in the presence of

corrosion by the gastric juice, provided the corrosion period does not exceed in duration that of normal gastric digestion, the tendency of an ulcer is to cicatrize spontaneously. Gastroenterostomy enables the stomach to evacuate itself in normal time or less, thus rendering conditions relatively favorable to healing, and will suffice to cure the majority of peptic ulcers, but he believes that the operation is not justified in many cases.

Diathermy in Local Skin Diseases.—Lullum Wood Bathurst (*Lancet*, October 20, 1917) says that diathermy is capable of promptly curing moles, warts, corns, stellate veins, telangiectases, capillary nevi, port wine marks, xanthelasma, acne, keloid, adenomas, freckles, etc. It has the advantages of being very rapid, of causing no inflammatory reaction, of being accurately limited, of being under control as to the depth of its effects, of producing a minimum amount of scarring, and of being comparatively painless. The patient is placed on the diathermy couch with his hands on the handles and the electrodes of the apparatus attached to the handles and the back plate. The patient is then charged with 0.25 to 0.5 amperes. The local treatment is then carried out by permitting sparks to pass from the patient, at the site of the lesions, to a pointed silver probe held by the operator. A single treatment is usually sufficient and requires but a few seconds for each blemish which is to be removed.

Use of Strychnine in Large and Ascending Doses in the Severely Wounded.—P. Hartenberg (*Bulletin de l'Académie de médecine*, October 9, 1917) employs strychnine to the physiological limit, with continuous increase in dosage to keep up the maximal effect in spite of the augmenting tolerance, which progresses rather rapidly. A one per cent. solution of the sulphate is given hypodermically morning, noon, and evening, beginning with five mgm. doses and increasing each of the three doses every day by 0.5 mgm., up to a maximum of a ten mgm. dose on the tenth day. This dose is continued and the drug then stopped after twelve to fifteen days, another series of injections being begun, if necessary, a few days later. These doses are generally very well borne, the reaction consisting merely of slight dizziness and stiffness of the lower extremities and jaw. Where any unpleasant reaction results, it will disappear if no increase in dose is made for two or three days. The method is devoid of danger. Through the nervous system, these large doses vigorously stimulate general nutrition and the internally secreting glands. It thereby effectively antagonizes the effects of traumatic shock, assists in the reaction against asthenia, and helps the patient to withstand operative procedures and the fatigue of transportation, as well as to regain his physical and mental stamina. It excites the appetite, regulates sleep, and, probably activating phagocytosis, seems to exert a local action in accelerating repair of wounds, and arresting persistent suppurative processes. Hartenberg is convinced that in the majority of cases it hastens recovery, and at times, in cases in a critical condition, it seemed to initiate a favorable trend.

Miscellany from Home and Foreign Journals

Spinal Puncture in Diabetes Insipidus.—

Evarts A. Graham (*Journal A. M. A.*, November 3, 1917) calls attention to the accumulated evidence which points to some disturbance of the hypophysis as being one of the chief factors in the production of diabetes insipidus and adds the record of an interesting case bearing upon this relation. The patient, a man twenty-four years old, had previously received an injury to his chest and about three months later began to complain of severe headaches, occasional nausea and vomiting, and some dizziness. At about the same time thirst and marked polyuria began and became progressively worse. Otherwise the patient was wholly without evidences of disease and the physical examination was negative. The x ray showed a very marked narrowing of the sella turcica. The urine was negative except for its great abundance and a specific gravity nearly that of water. A lumbar puncture was made and the spinal fluid spurted in a steady stream for a distance of about a foot. It was clear, straw colored and free from any abnormality. After the fluid pressure had been greatly reduced, but the fluid still running, the needle was withdrawn so as not to reduce the intraspinal pressure too greatly or too suddenly. The headache and vertigo disappeared immediately and the polyuria and thirst vanished almost as promptly. Marked vertigo was intense for the next four days, but then subsided and the patient was apparently cured. It is suggested that some factor associated with the injury had caused an increase in the volume of the cerebrospinal fluid and that this had interfered with the function of the hypophysis through pressure which was relieved by the puncture.

Tetanus and Exposure of the Feet to Cold.—

H. Vincent (*Bulletin de l'Académie de médecine*, October 30, 1917) lays stress on exposure of the feet or frostbite as a cause of tetanus. Even prophylactic serum therapy has not proved successful in completely eradicating such cases from military practice. Seventeen patients who had received three antitetanic injections in ten to twelve days succumbed to this condition, most of them from a hyperacute type of tetanus. Exposure of the feet seems to be an exceptionally effectual factor both in favoring multiplication of the tetanus bacillus and in antagonizing protection by antitetanic serum. Experiments performed by the author some years ago on guineapigs showed that it is especially localized exposure to moist cold which favors tetanus, and not an exposure of the whole body. Immersion and maceration of one posterior limb of a guineapig for two hours, the body and other posterior limb of the animal being kept warm in cotton, resulted in acute tetanus upon injection of tetanus spores. In the trenches, in winter, the inoculation seemingly takes place through preexisting erosions or excoriations, or through ulcers due to actual frostbite. Below 15° C. phagocytosis of tetanus spores is inhibited, and the edematous fluid infiltrating the foot and leg forms an excellent nutritive medium for the anaerobic organism. In this fluid tetanus toxin accumulates, and the subsequent absorption of the edema

is equivalent to an injection of tetanus toxin; whence the acuity of the symptoms and the possibility of their persistence beyond the period of passive immunity due to serum injections. The local circulatory stasis hinders penetration of the serum into the infected tissues. Prophylaxis should include a trial of watertight leggings, to prevent the entrance of water which tightens up the leg coverings and thus further promotes edema. Broad, well oiled shoes, woolen socks impregnated with some fatty material, and occasional loosening of the puttees for a few hours at least, are all important precautions. When the first twinges of pain indicating incipient frostbite are felt, the subject should betake himself to a heated sap, wash and rub his feet with alcohol, and don freshly greased socks and shoes.

Tachyphylaxis.—H. Busquet (*Presse médicale*,

October 22, 1917) refers to the observation by various investigators, a number of years ago, that an intravenous injection of peptone in the dog, causing loss of coagulability of the blood, immunized against a subsequent similar effect upon reinjection after coagulability has reappeared. In 1897 Gley and Le Bas showed that a dose of propeptone in itself too small to cause incoagulability, immunized within a few minutes after the first injection against subsequent production of incoagulability by a second, much larger dose. This form of rapid immunization was termed tachyphylaxis in 1911 by Champy and Gley. Various observers have found that various substances other than peptone, including various organ extracts, exhibit the same phenomenon. Although a final, definite explanation of the latter is not yet available, the conclusion is justified that the chief cause of the toxicity of organ extracts is their coagulant action, tending toward embolus production. Tachyphylaxis thus consists essentially in a rapidly induced incoagulability of the blood which obviates subsequent toxicity. Various drugs administered in man have already been found subject to tachyphylaxis, viz., arsenobenzol, peptone, sodium nucleinate, and chaulmoogra oil. Danysz found that while 0.2 gram of monosodium arsenobenzol injected in a rabbit caused convulsions and death in a few seconds, preliminary injection of 0.03 gram protected it completely from 0.25 given a few hours later. Busquet has noted that a preliminary injection in a dog of one tenth milligram of sodium nucleinate per kilogram of animal sufficed to protect from the hypotensor action—ascribed to coronary embolism or some similar interference—of an injection of five to ten milligrams given immediately after, whereas in the absence of the preliminary injection two milligrams caused a marked and prolonged hypotensor effect. Clinical application of this principle has already been made in relation to the several drugs mentioned. Recent experiments by Busquet with an emulsion of Kephir which contains microorganisms, showed that the same rapid immunization to a fall of blood pressure can be induced in the case of certain dead bacterial cultures. The author suggests that the principle of tachyphylaxis be applied clinically in the intravenous administration of organ extracts.

Breath Sounds in Incipient Tuberculosis.—H. A. Bray (*Journal A. M. A.*, November 24, 1917) reports the results of a careful study of the breath sounds at the apices in 124 cases of incipient pulmonary tuberculosis, made to determine the frequency and significance of the various changes. Of the forty-seven cases with lesion at the right apex seventy-four per cent. showed changes in the breath sounds at that apex, the remainder showed no changes, and in eight cases there were changes at the left apex which suggested the presence of a lesion there. Of the thirty-five cases with breath changes the expiratory murmur was affected in twenty, the inspiratory in nine and both in six. Of thirty-four cases with left apical lesions seventy per cent. showed breath changes and in nine cases there were alterations in breath sounds on the opposite side. Of the twenty-four positive cases at the left apex the inspiratory murmur was affected in eighteen, the expiratory in four, and both in two. In forty-three cases the disease was bilateral and the breath sounds suggested lesions at both apices in nine, at the right only in fourteen, and at the left only in eleven, the others showing no definite changes. Granular breathing was found to be rare if care were taken to remove the extraneous factor of chest motion by securing abdominal breathing. The duration of the breath murmurs was found to depend on the duration of the respiratory phases, the intensity on the force of the acts. Prolonged expiration was the most frequent sign at the right apex, but was very infrequent at the left. The large proportion of cases with negative respiratory signs was striking, and in many of the others the deviations from normal were so slight that they were little more than suggestive. Finally it was found that physiological changes interpreted as pathological constituted the commonest errors of diagnosis.

Hematomata of the Ovary.—Emil Novak (*Bulletin of the Johns Hopkins Hospital*, November, 1917) follows von Beust's classification of ovarian hematomata into follicular, corpus luteum, and stromal types. In investigating the surgical material from eighty-five cases, an overwhelming proportion showed that hematoma of the ovary is the result of hemorrhage into the follicular structures, including under this head the corpus luteum. The most frequent form of follicular hemorrhage is bleeding into the atretic follicle, which represents the common clinical type of follicular hematoma. In the follicular type, the source of the hemorrhage can be definitely traced to the vascular ring surrounding the follicle; primarily such hemorrhages are perifollicular. They are hence stromal, but if sufficiently great they may break through into the cavity of the follicle, forming hematomata. Another common condition is the corpus luteum hematoma, which may be distinguished by the yellowish wall of lutein tissue. The normal life history of the corpus luteum explains the various clinical types of these cysts. As in the case of the growing Graafian follicle, the corpus luteum may be arrested at almost any time by excessive bleeding into the cavity. This most commonly happens during the stage of vascularization, when a moderate amount

of hemorrhage normally takes place into the corpus lumen. The occurrence of stromal hemorrhages is not frequent, being most often found in the course of infectious diseases or with severe local inflammations. The menstrual histories of the cases studied showed that follicular hematomata were most common in ovaries removed at a period corresponding to the probable occurrence of ovulation, i. e., from about the seventh to the sixteenth day of the menstrual cycles, and that corpus luteum hematomata occur from about the sixteenth to the twenty-fifth day. Novak states that there is no ground for the belief held by many that the characteristic symptom of ovarian hematomata, whether of the follicular or corpus luteum type, is excessive menstruation. In the series studied, hematomata were found associated with practically all the usual pelvic lesions.

Spontaneous Liberation of Epinephrin from the Adrenals.—G. N. Stewart and J. M. Rogoff (*Journal of Experimental Medicine*, November, 1917) state that epinephrin continues to be liberated from the adrenals after section of the spinal cord in cats in the cervical region, as low as the last cervical segment, and this liberation has all the characters of the normal secretion with intact central nervous system. It is sustained through the same nerve paths connecting the cord with the adrenals. After section of the cord in the middorsal region the spontaneous liberation of epinephrin from the adrenals is abolished within the limits of detectability with the methods used, denervated eye reactions of Meltzer and rabbit intestine and uterus segments. The part of the cord concerned in the liberation of epinephrin apparently does not extend much below the third thoracic segment. Acute experiments were made on cats under urethane anesthesia which showed no change in the rate of liberation of epinephrin, that could be detected by the tests used, when the cord was severed in the cervical region.

Hypertrophic Stenosis of the Pylorus in Infants.—L. Emmett Holt (*British Journal of Children's Diseases*, July-September, 1917) reaches the following conclusions: Hypertrophic stenosis is a pathological entity. Many of the milder forms recover with only medical treatment. If they do not show marked improvement under medical treatment in two or three weeks, surgical treatment should be instituted. The symptoms indicating surgical intervention are rapid loss of weight, persistent vomiting, and forcible gastric peristalsis; the presence of a palpable tumor and abnormal gastric retention aid much in the diagnosis. The x ray reveals nothing of importance. Cases coming under observation after four or five weeks of vomiting and marked loss of weight are best treated surgically as soon as the diagnosis is made. The surgical procedure of choice is the simple external division of the circular muscular fibres proposed by Rammstedt. Growth and development are not impaired by gastroenterostomy or the Rammstedt operation. Cases not operated in usually show no symptoms after the first year but it is possible that this condition may be the basis of pyloric obstruction later in life.

Etiology of Trench Fever.—Alwin M. Pappenheimer, H. N. Vermilye and J. R. Mueller (*British Medical Journal*, October 13, 1917) present a preliminary report of the results of their investigations on the etiology of trench fever, in which they have found an organism which may possibly be the cause of the condition. In the blood of ten out of 151 cases circular or slightly oval bodies were found lying on the cells or free in the plasma. These had distinct outlines and a minute, intensely staining pigment granule located peripherally. These bodies were from one to one and a half microns in diameter. They were never found within the leucocytes. Their numbers varied in different patients from very few to very many. Their appearance in the peripheral blood seemed to be rather transitory, as they were found at one time and not a few hours later in the same patient. Similar bodies were also found in the periosteum, fascia, and muscle tissues in some cases and were successfully cultivated from such excised tissues. In cultures they showed some variations in size and morphology and seemed, in some cases, to pass through a definite cycle of development. Similar organisms were also found in the tissues of body lice obtained from a number of men. The organisms were not found to be pathogenic for several of the usual laboratory animals. It was not possible to carry these studies to the complete identification of the type of organism, but it seemed probable that it was not a bacterium, but rather of the genus of piroplasmata.

Pneumonia in Early Infancy and Childhood.—Henry Koplik (*Journal A. M. A.*, November 17, 1917) discusses this subject on the basis of a study of over 1,700 cases seen in hospital practice, where, he says, the conditions are better than in the homes. He points out that the ultimate outcome of all pneumonia in infancy and childhood depends chiefly on the vitality of the patient and his power of resistance. In some infants pneumonia or bronchopneumonia will spread over all of both lungs, while in others it will remain limited so that one may justly conclude that the patient's inherent resistance will successfully combat the disease. In older children the structure of the lung tends to prevent spread and there is usually a greater constitutional resistance to the disease. These are the underlying principles of pneumonia in infancy and childhood. Age is therefore of the greatest importance in the prognosis; thus the mortality is over sixty-three per cent. below three months; forty-eight per cent. from three to six months; 25 per cent. from six months to one year, eighteen per cent. from one to two years; thirteen per cent. from two to three years; and only 5.7 per cent. from four to ten years. Not only is pneumonia more fatal below two years of age than after, but also its complications are more frequent and more fatal in the earlier period. The most serious and dangerous complication among infants is involvement of the digestive tract, with marasmus or ileocolitis; second in order of gravity is meningitis; then meningism, which, however, in older children is usually of little gravity. So far as the digestive complications in infants are concerned there is no difference between breast fed children and those who are prop-

erly fed artificially. In treatment, especially of infants, the nursing and the care of the skin, eyes, and mouth is of the utmost importance. Proper feeding, which includes the proper preparation and administration of the food, is extremely important. An abundance of warm fresh air and good light should be provided. In the drug treatment the antipyretics find little or no place and should be abandoned in favor of sponging with lukewarm water; what few drugs may be required should be given hypodermically rather than by the mouth, as this prevents the likelihood of upsetting the stomach. Camphor, caffeine, and digitalis are the three drugs which may be needed and are about the only ones which are of any value in the treatment of pneumonia. A careful study of a series of cases treated with whiskey and one treated without favors the latter plan and shows that the administration of whiskey is not justified by any demonstrable beneficial results.

Rapid Detection of the Diphtheria Organism in Diphtheria Patients and Carriers.—Costa, Troisier, and Dauvergne (*Presse médicale*, October 25, 1917) employ a culture medium consisting of horse serum, 100 mls; sterilized thirty per cent. glucose solution, ten mls; concentrated and sterilized litmus tincture of the Pasteur Institute, thirty drops; one per cent. sulphuric acid solution, three mls. This mixture is placed in Petri dishes. Inoculations having been made from sterile cotton swabs, avoiding contact with the saliva, the Petri dishes are placed in the incubator and examined after twenty-four hours. Colonies of the diphtheria organism, of pinhead size and more or less deeply embedded in the medium, will now be apparent; they are slightly reddish in the centre and pinkish at the periphery. Observed against the light with a magnifying glass they are, as a rule, rather transparent. False diphtheria colonies are more opaque, more irregular, do not attack the glucose, and have no effect on the litmus.

Facial Paralysis Following Pasteur Antirabic Treatment.—Robert L. Levy (*Journal A. M. A.*, December 1, 1917) reports the case of a man of neurotic temperament who was scratched by a dog, not subsequently shown to have had rabies. Against the advice of physicians the patient took the classical Pasteur treatment, during and after which he complained of neuralgic pains and the sensation of something crawling under his skin. Seventy-three days after the beginning of treatment a complete left facial paralysis developed. A little over two weeks later the right side became similarly involved, the development being gradual. Treatment, though persistent, made little impression on the paralysis. The literature contains records of only about 150 cases of paralysis following antirabic treatment, and of these only ten were cases of isolated involvement of the face. The remarkable feature of this case is the long interval between treatment and the development of the paralysis, which is about twice as long as the longest case previously reported. The cause of the facial and other "treatment" paralyses is unknown, but their occurrence is so rare that, although the victims often do not recover rapidly, they cannot be considered as in any way deterrent to the use of the treatment.

Proceedings of National and Local Societies

SOUTHERN MEDICAL ASSOCIATION.

*Eleventh Annual Meeting, Held at Memphis, Tenn.,
November 12, 13, 14 and 15, 1917.*

The President, Dr. DUNCAN EYE, of Nashville, Tenn., in the Chair.

SECTION IN SURGERY.

Tumors of the Urinary Bladder.—Dr. EDWARD S. JUDG and Dr. S. W. HARRINGTON, of Rochester, Minn., stated that from a therapeutic standpoint, bladder tumors might be classified as those satisfactorily treated by endovesical methods and those requiring open operations. There was no question that the benign papilloma would usually respond to fulguration. Exceptions to this would be in multiple papillomata in which the treatments would be numerous and prolonged, or in case the individual was not tolerant to the treatment. It would be better to do an open operation in either of these instances. It had been their custom to have all of their bladder tumor cases examined cystoscopically at definite intervals following the original operation with the view of keeping down any suggestion of a recurrence. In the past few years they had found fourteen cases of recurrence following resections which were amenable to fulguration. One of these patients was fulgurated fifteen months following the resection and had been well for two years. One was fulgurated after two years and had been well for four years. One was fulgurated after eighteen months, and the patient now stated, three years after this treatment, that he was well. One was fulgurated after three years and had not been seen for three months. One had been fulgurated yearly for the last three years for recurrences, and was last examined five months ago. One was fulgurated one month after operation and had not been seen for three months.

In case the benign tumor did not respond readily to fulguration, it should be removed by an operation. These papillomata cystoscopically simulated benign growths, and their poor behavior under fulguration suggested malignancy. All definitely malignant papillomata, either of the papillary type of carcinoma or of the type infiltrating the bladder wall, were best treated by the open operation at once. All large benign tumors, such as myomata, fibromata, and angiomata, should be removed by suprapubic operation. The operative procedure for tumor of the bladder consisted of excision of the tumor and resection of the portion of bladder wall from which the tumor arose. A simple excision of the tumor was only permissible in the case of a papillary tumor on a pedicle, and even with this form of tumor, it was better to excise a portion of the adjoining bladder tissue. Excision of the growth was not sufficient and was no safer than resection. In all cases, resection should include the entire thickness of the bladder. This meant the invasion of the prevesical space, but with modern technic, it added very little, if anything, to the operative risk. If the resection was not extensive, the remaining opening could be closed and drainage established through the bladder. If a large

segment of bladder was removed, it was better to drain the space for several days. The drain could be brought out through the bladder or along the side of the bladder. If the prevesical tissues were exposed, drainage was essential.

The treatment of bladder tumors was gradually being settled on a definite basis. Much experience with the endovesical treatment had demonstrated the type of tumor that could be cured by fulguration and also the type of tumor that did not respond to this method of treatment. Further experience with the suprapubic open operation had taught them that a radical excision of the tumor, the portion of the bladder wall involved, and the prevesical tissues could be performed with satisfactory immediate and ultimate results.

Treatment of Tropical Abscess of the Liver.

Dr. JOHN S. HELMS, of Tampa, Fla., stated that there was little doubt as to the causal relation between the *Entamoeba histolytica* and liver abscess of the tropical variety among those who were experienced in the observation of this disease. It must be admitted that there was such a thing as bacterial infection and consequent abscess of the liver separate and apart from amebic infection, and that in most cases where the ameba was the primary cause of the liver abscess, there was also a bacterial infection. It had been proved that the ameba of man carried with it pyogenic organisms that might be in the bloodstream and find lodgment in the area of lessened resistance of the liver due to the presence of amebae.

The general conception was that the abscess was usually a single one, but the experience of the best observers, however, seemed to prove that in about fifty per cent. of the cases the abscesses were multiple. Where the abscess was solitary it was generally located in the right lobe and usually near the convex surface, and in many instances its dome underneath the diaphragm. After the diagnosis had been made, he believed that there was no other treatment except surgical that was based upon any certainty of good results. It had been his practice, and he was convinced it had a rational basis, to adopt the open treatment and to effect drainage through the transperitoneal route, and he believed, after a rather large experience with operation upon these cases, that it was always practical.

Hypertrophic Pyloric Stenosis in Infancy.

Dr. WILLIAM D. HAGGARD, of Nashville, Tenn., said that pyloric stenosis presented a picture so characteristic and clear cut that diagnosis should not fail; even a mild case should be recognized provided every case of vomiting in infancy be given adequate consideration and a careful examination. We had no symptoms of toxemia or strangulation, and the symptoms and their sequence were classical. Palmer enumerated them in the order of their importance as follows: 1, persistent, recurrent, explosive vomiting; 2, starvation stools and diminished urine, with emaciation; 3, visible gastric peristalsis; 4, palpable tumor; 5, bulging epigastrium, with stretched abdomen; 6, progressive loss of weight.

The symptoms might appear a few days after birth, or be delayed until the second and rarely the third month. They usually appeared during the third or fourth week. Vomiting was the first symptom usually noted. A previously healthy, normal, usually robust male, breast fed baby, began to vomit abruptly in the third or fourth week without apparent cause. To the persistent, explosive, forcible vomiting was added symptoms of faulty nutrition, constipation, oliguria, and steady loss of weight. The vomiting was characteristic and different from other vomiting in young infants. Visible gastric peristalsis was a constant symptom. The wave passed from left to right and might be elicited after taking food. Palpation a little to the right and above the umbilicus often revealed a tumor about the size and shape of a small green olive. The tumor was most distinct in the more severe cases with thin retracted abdominal walls. It was variable in its position and might be out of reach under the liver. If every patient with hypertrophic pyloric stenosis was operated upon as soon as the diagnosis was established, with the present improved technic the mortality for this condition when subjected to operation might be reduced generally to approach ten or fifteen per cent. Failure to seek prompt surgical relief was too often fatal; even though the baby might be apparently holding its own under medical treatment, he might suddenly and without apparent cause become progressively worse and die in a short time.

The Treatment of Acute Diffuse Peritonitis.—Dr. H. A. GAMBLE, of Memphis, Tenn., stated that it was his practice to open the abdomen under general anesthesia, remove or repair the primary lesion, introduce split rubber drainage tubes with gauze wicks into Morrison's pouch, the pelvis, and wherever else indicated, and complete the work as expeditiously as possible. From there on the main indications were to maintain free drainage, promote elimination, sustain the strength of the patient, and guard against complications. The patient upon being placed in bed was put in the sitting posture and 500 c. c. of normal salt solution administered subcutaneously. This was repeated every four to six hours. Plain warm water was started also at once by Murphy's method of proctoclysis. He did not feel that for the first twenty-four to forty-eight hours absolute dependence could be placed upon absorption from the rectum and colon. It had been his observation that where there was a profound toxemia the processes of absorption from the intestinal tract had frequently been held in complete abeyance. This also applied at times to the subcutaneous tissues, and he had, under such circumstances, converted an apparently hopeless case into one which recovered by blood transfusion.

Dressings were changed frequently, every one to two hours for the first twenty-four hours, instead of allowing them to become thoroughly saturated. In the aftertreatment of these cases one had constantly to be on his guard for complications, the most important of which in the order of their frequency were acute dilatation of the stomach, secondary abscesses, intestinal obstruction, and phlebitis. Acute dilatation of the stomach was associated with a large proportion of all cases of diffuse peritonitis, and was best treated by frequent gastric lavage,

keeping the stomach empty, and the administration of pituitrin. The treatment of other complications was along general surgical or medical principles.

Kidney Surgery.—Dr. JOHN R. CAULK, of St. Louis, Mo., stated there had been thirty-three nephrotomies or nephrostomies; fifty nephrectomies; ten pyelotomies or ureterotomies; eleven fixations; three decapsulations. There had been forty operations for stone, on thirty-six patients; seventeen nephrotomies or nephrostomies; ten pyelotomies and ureterotomies; nine primary nephrectomies and four two stage operations. Twenty-one were done on the right side, seven on the left, and eight bilateral. The symptom of kidney pain had been variable; twenty-eight of the thirty-six cases had pain; only seventeen of these had had colic. There had been sixteen nephrectomies for tuberculosis. More than that number were refused operation on account of double involvement or other complications. Of these sixteen cases, they were all unilateral but two; these two did not improve after operation, and both died within six months.

There had been twenty-nine operations for non-tuberculous renal infections, infected hydronephrosis, pyonephrosis, or pyelonephritis. Of this group there had been twenty primary nephrectomies and nine two stage or secondary nephrectomies. On three patients nephrostomy had been done for ureteral ligation complicating pelvic surgery, one a double, two a single ligation. He had done eleven kidney fixations for floating kidney, and in spite of the discouraging results which were credited to this type of surgery his results had been the best of all. There had been four nephrectomies for tumor; two for carcinoma; two for hypernephroma. Two were done by lumbar nephrectomy, one transperitoneal. One patient lived three years; he enjoyed two years of excellent health, gained considerably in weight, and died of bone metastases. Another died within two months. Two were living and well, one a year, and one a year and nine months after operation.

Latent Manifestations of Syphilis in and About Joints.—Dr. EDWARD S. HATCH, of New Orleans, La., drew the following conclusions: Joint syphilis is much more common than is generally supposed. In the x ray findings and in the luetin reaction, we have nearly positive diagnostic aids. An x ray picture and Wassermann and luetin tests should be made in all suspected cases, and if there is doubt, the therapeutic test should be applied. The necessity of this was plain, as the treatment of the diseases likely to be confounded with joint syphilis was quite different from the treatment of that disease.

Radium in Nonmalignant Uterine Hemorrhage.—Dr. C. JEFF MILLER and Dr. E. L. KING, of New Orleans, La., stated that the nonmalignant conditions of the uterus causing menorrhagia or metrorrhagia might be grouped as follows: 1, cases in which there was little or no demonstrable pathological change in the uterine wall and no history of infection and in which the uterus was apparently normal in size and position with normal annexa. In such cases, the bleeding was in all probability due to some disturbance of the internal secretions, especially of the thyroid or of the ovary. This condi-

tion was often encountered in young girls about puberty. 2. The menopause; 3, chronic metritis; 4, hypertrophy or hyperplasia of the endometrium, especially when so marked as to be adenomatous or polypoid in character; 5, fibroids, adenomata, or adenomyomata of the uterus; 6, chronic endometritis, especially after incomplete abortion; 7, passive congestion of the uterus, as in retroflexion or prolapse. In the first three groups radium might be used to the exclusion of surgery; in groups four and five, some cases were suitable for radium and others required operation; while in groups six and seven, operation was indicated.

They had treated ten cases classified under groups 1 and 2. The youngest was a girl of sixteen years, who had bled profusely for months; the others were from twenty-five to forty-six years of age. In all of them, the bleeding had persisted for years. They had all been curetted from one to six times without relief; most of them had also been treated medicinally in various ways; one had had twenty-three and one twenty-eight x ray treatments. All were naturally anemic and debilitated, especially the sixteen year old girl, who was in bad shape. Nine of them were given intrauterine radium treatments, the average dose being about 1,000 milligram hours. One patient was given a very short treatment, two and a quarter hours' treatment, the radium being placed in the upper vagina. The periods became normal, and she was now in robust health. In only one patient did the treatment fail to relieve the condition. In two other cases it was necessary to repeat the treatment. Only one patient suffered from severe menopausal symptoms, although in several of them the symptoms were present in a mild degree.

The next eighteen cases fall in the third and fourth groups. The patients ranged in age from thirty to fifty-five years, and most of them had suffered from bleeding for several years—as a rule, menorrhagia first, and later metrorrhagia as well. In every case examination revealed a large, often tender uterus, with no sign of tumor or annexal trouble. Of these eighteen patients thirteen had been curetted from one to four times, and seven had had other operations on the uterus or annexa performed at the same time, all without relief. One of these had also had subsequent x ray treatments, with no improvement. The other five had been treated medicinally in various ways, including packing. In every case, radium treatment was followed by amenorrhea; in two patients there was a recurrence of the bleeding about one year later, the flow being approximately normal. The others are still relieved. Six patients suffered from marked menopausal symptoms; five others were similarly affected, but the symptoms were mild and transient. The patients suffering most from the artificial menopause were nearly all between forty and fifty-one years of age; this coincided with their experience after hysterectomy. In three women aged thirty-five, forty-five and fifty-one years, the condition was relieved by corpus luteum extract. Eight patients suffered from leucorrhea for two or three months after the treatment. In those cases in which subsequent pelvic examinations were made, marked reduction in the

size of the uterus was found, and the tenderness, as a rule, disappeared. The dosage in these cases was 500 to 1,000 milligram hours. Their results had been and were most gratifying, and they believed there was a definite field for radium therapy in the treatment of these annoying and often obstinate affections. It was not a cureall, but its judicious use would often obviate the necessity of a mutilating operation with the attendant risk and discomfort to the patient, whose wellbeing should be our constant object.

Lumbosacral Backache in Women.—Dr. EDWARD H. RICHARDSON, of Baltimore, Md., said that the determination of the specific cause of lumbosacral backache in a woman involved a careful study both in the domain of the orthopedist and in that of the gynecologist. In the former, we must scrutinize the lower spine and the lumbosacral and the sacroiliac articulations very closely for evidences of arthritis, injury, and chronic strain from one or more of the causes enumerated above. In the last the point to remember was that with rare exceptions whatever the nature of the particular gynecological disorder it produced lumbosacral backache only through the strain incident upon faulty posture, and that no matter how skillful our operative therapy, it would often fail utterly to relieve the backache unless supplemented by orthopedic measures which would restore normal balance.

Treatment of Tetanus Following Laparotomy by Subarachnoid Injections of Magnesium Sulphate and Antitetanic Serum.—Dr. DEWITT B. CASLER, of Baltimore, Md., drew the following conclusions: Certain patients were definite tetanus carriers, and, as such, were liable to be a source of infection to themselves in any surgical operation on the bowel or about the rectum. In any abdominal operation, especially in pelvic work, where the surgeon had to deal with inflammatory masses, indurated and adherent to the bowel wall, great care should be taken to close in this indurated area as thoroughly as possible and so avoid the danger of tetanus developing in the injured bowel wall. It was wise in every case of postoperative tetanus to begin at once subcutaneous injections of magnesium sulphate, and in the severe cases, subarachnoid injections. It must be borne in mind that there is always a certain amount of danger from paralysis of the respiratory centre, and when subarachnoid injections were given, means for artificial respiration should be at hand. Magnesium sulphate given intraspinally afforded the greatest amount of comfort and relief to those cases, where death often came, not only from the toxemia, but from exhaustion.

The Role of Syphilis in Surgery.—Dr. GEORGE GELLHORN, of St. Louis, Mo., said that he had seen extensive suppurations of the abdominal incision resist all possible treatments for weeks, but turn into clean and vigorously granulating wounds as if by magic when antilutetic treatment was instituted. He recalled four cases in which the entire abdominal incision broke open about a week after operation. The tissues of the abdominal wall showed no tendency whatever to unite, but there was no supuration present. All four patients were profoundly cachectic. Two were probably not luetic, but one

was a frank syphilitic and the fourth, despite a negative Wassermann, was probably diseased. It would be interesting and important to know how high the percentage of syphilis was in such cases of complete disinclination of the tissues to heal. He had at present under his care a woman with tertiary syphilis in whom several surgeons had unsuccessfully attempted to repair a third degree laceration of the perineum. He subjected this patient to energetic antisiphilitic treatment with the view of softening the cicatricial tissues about the vulva and of forestalling disturbances of wound healing. In the course of this treatment, which included several injections of salvarsan, a laparotomy for pus tubes became necessary; and the patient went through this operation without the slightest complication.

SECTION IN PUBLIC HEALTH.

Health Education in Rural Districts.—Dr. L. A. RISE, of Columbia, S. C., stated that two counties in South Carolina this year were induced to appropriate money through the legislature for a campaign for better health in their rural districts. Notwithstanding the phenomenal rise in the price and scarcity of labor and material in his State, they had been able to make a fair showing, and to stir up an enthusiasm for civic betterment along the line of disease prevention which would cause a demand on the part of the rural population in these counties for a continuation of this work next year. They had largely stressed the prevention of intestinal diseases by approved methods of sanitation, but they had also devoted a part of their work to the prevention of tuberculosis and diseases of childhood. Lectures in schools, both negro and white, had been given in practically every community.

Popularizing Public Health.—Dr. C. E. TERRY and Dr. F. SCHNEIDER, JR., of New York, stated that one of the first ways in which health officers felt the disturbing influence of the war upon disease prevention organization was with regard to public health nurses. With the creation of an American army abroad a large military nursing service had to be created with great haste. The Red Cross issued a call to its nurses. Many public health nurses responded, women doing infant mortality, tuberculosis, and contagious diseases work in our cities. The withdrawal of these nurses produced an acute situation. The matter came to a head, and the mature judgement of the authorities was that public health nurses would be more useful left in their existing occupations. The Red Cross went further than this. Seeing the especial importance of public health work in war time, the organization turned over eight nurses to the State Department of Health in Massachusetts, these women to be employed on new child conservation work.

For the saturation and resaturation of our public with a realization of health truths and with a knowledge of the importance of health work, the family magazine had unparalleled possibilities. In addition to the magazine stories, the Seventh Baby Campaign had pushed this experiment in constructive journalism a step further. A field force of trained and experienced public health nurses had been assembled and two traveling laboratories with experienced laboratory men had been provided. This field

force was now engaged in making surveys of infant mortality in particular, and public health work in general, in communities between 10,000 and 40,000 population throughout the country. Careful inventories of local conditions were made, and reports were submitted giving findings and outlining a practical program for public health progress. The field work was conducted only upon the request of local authorities and with their cooperation. The subjects covered were infant mortality in particular, that is, the number and causes of infant deaths and existing efforts to prevent them; milk supply; water supply; sewers and sewage disposal; privies and fly-breeding; waste disposal, and organization and budget of the health department.

Distribution of Vaccines and Serums by the State.—Dr. C. A. SHORE, of Raleigh, N. C., stated that diagnostic work was most useful when done near to the patient, and therefore the establishment of municipal laboratories was always to be encouraged where practicable. In his own State of North Carolina they had no great cities, but a large number of flourishing and prosperous communities with a population between 20,000 and 40,000. Each of these little cities and many of the counties should have its own laboratory for diagnostic purposes and for the control of its water and milk supplies. The State laboratory should serve the sections not otherwise provided for, and in addition should have a much wider field of usefulness and a direct public health service in making and distributing those vaccines and serums which had been accepted as reliable, curative, or prophylactic agents. The next work taken up in their laboratory was the distribution of typhoid vaccine. This was given free to all registered physicians, and they had been sending out annually for three years an average of 400,000 doses. They estimated that at least 100,000 citizens were immunized against typhoid fever each year. He believed in the free distribution of diphtheria antitoxin. It was only then that we could hope for its use in all cases of diphtheria.

(To be continued.)

Letters to the Editors.

PROPAGANDA AGAINST THE HEALTH OF OUR TROOPS.

J. RUE BELLOT, GENÈVE, SWITZERLAND.

November 23, 1917.

To the Editors:

"While there is Life there's Hope." This is the motto of one of our most independent and thoroughly American periodicals, one to which I have been a subscriber for over a quarter of a century, during which time I have been highly edified by its contents, as any good Yankee should be.

It seems to me, however, that for the duration of the war this otherwise excellent publication might see fit to desist, if only for the safety of the "boys somewhere in France," whose welfare it is so sentimentally loud in proclaiming, in its frantic and ill advised campaign against scientific preventive medicine. The harm wrought by such propaganda is unquestionably great and obstructs the protection of our troops from disease. If Life wants us to rely on hope, then in the name of Mother Eddy, *Life's* patron saint, let it remain quiet.

Very truly yours,

CHARLES GREEN CUMSTON, M. D.

Book Reviews.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

Radium Therapy in Cancer. At the Memorial Hospital, New York. First Report: 1915-1916. By HENRY H. JANeway, M. D. With the Discussion of Treatment of Cancer of the Bladder and Prostate by BENJAMIN S. BARRINGER, M. D., and an Introduction upon the Physics of Radium by GIOACCHINO FAILLA, E. E., A. M. New York: Paul B. Hoeber, 1917. Pp. 242. Price \$2.25.

The report, the first issued by the Memorial Hospital of New York, covers a period of two years, during which 424 cases of malignant tumors were treated with radium. At present the hospital has at its disposal a total quantity of about 2.8 grams of radium element in the form of the bromide, the emanation from which is employed in treatment. The author believes that the cells of the majority of malignant growths particularly epidermoid carcinoma, are four times as susceptible to the action of radium as are the cells of the normal tissues, and that this relationship is very materially altered by too frequent applications of radium. The susceptibility of the two tissues, cancerous and normal, may become about equal, or there may be an actual reversal of the primary relative susceptibilities. The best results, the author states, have been obtained by giving a single maximum dose, and this is done whenever possible. The application is given to the growth itself, while at the same time an effort is made to preserve the adjacent normal tissue. In an effort to prevent extension of the growth by metastasis and infiltration, the growing borders are rayed, especially upon that side which drains into the neighboring lymphatic glands.

The author suggests the following dosage: "Sixty millicurie hours per tube will constitute a safe dose when small areas of one to five square centimetres are covered, the filtration being through one millimetre of rubber covered platinum tubes. If it is through two millimetres of rubber covered lead it may be increased to 100 millicurie hours per tube. Through 0.5 of German silver thirty centimetre hours per tube may be given. Such dosage will be curative to superficial, circumscribed lesions, will not cause an objectionable degree of radium inflammation and will be curative to superficial small cancers. . . . For deep penetration 10,000 to 12,500 millicurie hours may be applied per 100 square centimetres, filtered through two millimetres of lead, and at a distance of six centimetres. A second dose may be applied at an interval of five weeks, and should be reduced to 8000 millicurie hours. Two such treatments will cause the retrogression of susceptible carcinoma without a serious change in the normal tissues."

The varieties of malignant neoplasms most susceptible to the radiations of radium are stated to be the cellular teratomas and lymphosarcomas. This opinion as far as lymphosarcoma is concerned agrees with the conclusions reached at the London Radium Institute, stated in their last report for 1915-1916.

The report contains a complete record of each case, giving the details of treatment, including the form of applicator, the amount of filtration, the number of millicuries employed, the duration of application and the results. The author believes that the results obtained justify the use of radium upon operable cancer of mucous membranes. The propriety of treating a primary early cancer by radium to the exclusion of a radical operative procedure will be questioned by many. Two years is too short a time to speak of results and we shall have to wait for many reports before we can judge of the true value of radium in the treatment of malignant tumors. The conclusions, however, will be of value as a guide to those employing this agent. Doctor Barringer contributes a report of twenty-five cases of carcinoma of the bladder and thirty cases of carcinoma of the prostate treated with radium since October, 1915, and Mr. Failla writes an introductory article on the physics of radium with an excellent resume of what is known of the electron and a description of the method of collecting the emanation.

St. Luke's Hospital. Medical and Surgical Reports. Volume iv, 1917. East Stroudsburg: The Press Publishing Co., 1917. Pp. xii+404.

This is the fourth volume of these reports and, like its predecessors, brings together the several contributions on surgery and medicine made during the year by members of the staff. Several of the papers have become well known, such as the Treatment of Poisoning by Mercuric Chloride as worked out by Lambert and Patterson. In addition to these reprints there are several short new communications, the book being opened by one on The Cure of Uterine Fibroids by Radium, by Dr. Robert Abbe. Others are a report on a series of pneumococcal pneumonias classified according to the group type of organism, by Frissell and Famulener; a short paper on Nitrogen Retention in Cases of Nephritis, by Frissell and Vogel; an extensive and profusely illustrated paper on Bone Grafting in Spinal Tuberculosis, by T. Halsted Myers; etc. It is not alone the reprinted and new papers which make this volume valuable and interesting, for there is here presented an extensive volume on laboratory technic, giving the methods which are used at St. Luke's Hospital. This part of the report covers over 175 pages and is a very concise, yet complete, discussion of the modern diagnostic laboratory methods with practical hints on the most satisfactory and simplest ways of carrying them out. It is unfortunate that this part of the book is not indexed for easy reference, but it is stated that this material will be published separately in book form and we hope that it will then be made more useful by having a good working index. All in all, this volume of the reports is a specially interesting one and contains a wealth of valuable information.

Births, Marriages, and Deaths.

Born.

CROHN.—In New York, N. Y., on Thursday, December 27th, to Dr. Burrill B. Crohn and Mrs. Crohn, a son

Married

EAST-SANFORD.—In Deadwood, S. D., on Saturday, December 15th, Dr. John H. East, of Denver, Colo., and Miss Mamie Sanford.

LIGHT-NEUMAN.—In Broad Ripple, Ind., on Wednesday, December 19th, Dr. Robert C. Light and Mrs. Gertrude May Neiman.

Died.

BEMIS.—In West Middletown, Pa., on Monday, December 24th, Dr. James N. Bemis, aged seventy-two years.

BURD.—In Ogdensburg, N. J., on Thursday, December 13th, Dr. Lewis C. Burd, aged fifty-eight years.

FINLEY.—In Los Angeles, Cal., on Monday, December 17th, Dr. Theodore G. Finley, aged forty-two years.

GALLOWAY.—In St. Louis, Mo., on Friday, December 14th, Dr. William L. Galloway, aged fifty-seven years.

GRAY.—In Chicago, Ill., on Monday, December 17th, Dr. Albert Stone Gray, aged fifty-four years.

HACKNEY.—In Philadelphia, Pa., on Friday, December 21st, Dr. Evan Jeffries Hackney.

HANSON.—In St. Louis, Mo., on Tuesday, December 11th, Dr. Edward M. Hanson, of Keokuk, Ia., aged forty-eight years.

HASTINGS.—In Malone, N. Y., on Sunday, December 23d, Dr. Clarence A. Hastings, aged fifty-five years.

HEARN.—In Media, Pa., on Friday, December 21st, Dr. W. Joseph Hearn, of Philadelphia, Pa., aged seventy-five years.

HOLMAN.—In Butler, Pa., on Thursday, December 13th, Dr. Albert Holman, aged sixty-four years.

HOYT.—In Sharon, Pa., on Sunday, December 16th, Dr. Charles W. Hoyt, aged seventy-eight years.

JANEWAY.—In Baltimore, Md., on Thursday, December 27th, Dr. Theodore Caldwell Janeway, aged forty-five years.

PARDEE.—In New York, N. Y., on Friday, December 28th, Dr. Ensign B. Pardee, aged sixty-four years.

SHOBE.—In Jerseyville, Ill., on Wednesday, December 12th, Dr. A. A. Shobe.

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Original Communications

INSTRUCTION AND SUPERVISION OF EXPECTANT MOTHERS IN NEW YORK CITY.

By JACOB SOBEL, M. D.,

New York,

Chief, Division of Baby Welfare, Department of Health, New York.

The instruction and supervision of expectant mothers in relation to maternal and infant morbidity and mortality presents different problems in various urban and rural communities. Each must approach the subject according to its own needs. It is not proposed, in this article, to enter into the matter as it relates to the country at large but rather to present the subject from the standpoint of the city of New York. We believe that we are not exaggerating when we say that in no other city, perhaps, is the problem more complex or of greater magnitude.

New York is the most cosmopolitan city in the world. Within its confines are many sections which are little cities in themselves, differing from one another as much as do the different cities of the United States. James Creelman summarized this viewpoint rather tersely when he said: "New York is a Niagara of conflicting bloods, tongues, religions, and civilizations, flowing together from all parts of the earth, and carrying with it the social and political prejudices and discouragements of older nations. London is English, Paris is French, Berlin is German, St. Petersburg is Russian, and Canton is Chinese. But who will say that New York, the largest municipal unit in the world, is American?"

The practical truth of this statement is shown by the records of one of the baby health stations in this city, which includes among its clientele not less than eighteen nationalities and races—American, Armenian, Austrian, Canadian, Colored, Danish, English, French, German, Greek, Irish, Italian, Jewish, Polish, Russian, Scotch, Spanish, Welsh. It follows from this that the problem of the expectant mother must be approached from different angles in many sections of the city, if results are to be expected. In this city, as in many others, the municipal health authorities have realized for some time that any definite and pronounced impression upon the future infant morbidity and mortality rates must come in two directions: control of infant deaths due to congenital diseases, as congenital debility, prematurity, narsamus, convulsions, accidents at birth, etc.; and reduction in infant deaths during the first month of life. The problem that faces us in New York,

and that has remained practically unchanged for several years, is as follows:

1. Forty-one per cent. of all deaths under one year of age are due to congenital diseases. 2. Approximately thirty-seven per cent. of all deaths under one year of age occur during the first month of life. Of this percentage, about twenty-seven per cent. take place during the first ten days of life and about ten per cent. from the tenth to the thirtieth days of life. 3. About seventy-five to eighty per cent. of all deaths during the first month of life, and approximately ninety per cent. of all deaths during the first ten days of life are due to congenital diseases. 4. During the thirty year period from 1884 to 1914, the death rates from diarrheal, respiratory, and contagious diseases have been markedly reduced—approximately seventy-five per cent. fifty-three per cent., and eighty-eight per cent. respectively—while the death rate from congenital diseases has been reduced only 1.5 per cent. In fact, during the past five years, the infant death rate from congenital diseases has remained practically stationary. 5. The death rate during the first month of life has remained practically unchanged for many years, while the total infant mortality rate and the rate from the second to the twelfth months of life have progressively declined:

Year*	Death rate under one month of age	Death rate from 2 to 12 months	Death rate under one year of age
1911	39.24	72	111
1913	37.69	63	100
1916	37.22	56	93

*Based on 52 weeks to the year.

6. While, in former years, diarrheal diseases occupied the first place in the list of "baby killing diseases," today we find that this nonvenifiable position has been taken by the congenital diseases, with respiratory diseases second and diarrheal diseases third. 7. The majority of deaths due to congenital diseases are dependent upon the health and environment of the mother before the birth of the child. 8. The number of maternal deaths incident to child bearing, while showing a reduction per 10,000 women from fifteen to forty-four years of age and per 1,000 labors, is still too high for an enlightened community. 9. The death rate from conditions associated with pregnancy, other than puerperal sepsis, has declined, per 10,000 women of child bearing age, from 3.79 in 1898 to 2.9 in 1916. The puerperal sepsis death rate per 10,000 women of child bearing age during the same period has

decreased from 2.58 in 1898 to 1.02 in 1916. There has also been a decrease in the puerperal sepsis death rate, based upon 1,000 labors, which include stillbirths and living births, from 1.97 in 1908 to 1.55 in 1916. From other conditions associated with pregnancy, per 1,000 labors, the rate has declined from 5.26 in 1908 to 4.58 in 1916. That more women between fifteen and forty-four years of age died in the United States from conditions incident to maternity, than from any other cause except tuberculosis, is the statement of the Children's Bureau at Washington. The following data show the situation in New York.

DEATHS OF FEMALES FROM FIFTEEN TO FORTY-FOUR YEARS OF AGE, INCLUSIVE, IN NEW YORK, IN 1916.

Deaths due to diseases incident to pregnancy (puerperal diseases).....	653
Deaths due to tuberculosis, all forms.....	2,347
Deaths due to circulatory diseases (of which 986 were due to chronic cardiac disease).....	1,144
Deaths due to acute respiratory diseases.....	723
Deaths due to diseases of digestive system.....	490
Deaths due to diseases of the genitourinary system, other than puerperal.....	850

The number of maternal deaths is, however, only an index of the number of injuries and accidents

nounced decrease in the total infant mortality rate, with a decrease in the mortality rate from the second month to the end of the first year, and with a stationary condition of the infant death rate during the first month of life and from congenital diseases, the point of attack becomes clear. For many years the Department of Health has realized the significance of this situation and has endeavored, through the Bureau of Child Hygiene, within the limits of its budgetary appropriation, to meet it. Since the latter part of 1913, despite the fact that no special funds have been available for what is conveniently termed "prenatal care," the Bureau of Child Hygiene has so readjusted its nursing force as to maintain a special corps of eight nurses the year round at the baby health stations for this important phase of the work. Prenatal instruction is, in a sense, a misnomer. Our work does not cease with the birth of the child. Instruction and supervision of the expectant mother implies, as we see it, a careful and systematic follow up of the future mother during the period of pregnancy, the puerperium, and at least until the child is one month of age, and longer if conditions in the mother or child warrant it. In the near future we expect to go further and to

NAME _____		ADDRESS _____		MILK STATION _____		CASE NO. _____	
DATE OF FIRST VISIT _____		AGE _____		BIRTHPLACE _____		AGE OF FATHER _____	
DATE OF EXPECTED CONFINEMENT _____		DATE CONFINED _____		HOSPITAL _____		HOME _____	
				PHYSICIAN _____		MIDWIFE _____	
GENERAL HISTORY				CONDITION OF MOTHER—NUTRITION GOOD FAIR POOR CONSTIPATION YES NO			
TUBERCULOSIS YES NO LUES YES NO				DIARRHOEA YES NO VOMITING MILD MOD. SEVERE URINE _____			
OTHER DISEASES _____				ODEMA YES NO HEADACHE YES NO REMARKS _____			
ALCOHOL KIND AMOUNT _____				SOCIAL CONDITIONS—MOTHER—MARRIED SINGLE WIDOW DIVORCED			
				MOTHER'S WORK _____ WAGES OF FATHER PER WEEK _____			
PREVIOUS PREGNANCIES				MOTHER CHILDREN RENT PER MONTH			
				NO. IN FAMILY _____ NO. OF ROOMS _____ NO. OF BOARDERS _____			
RESULT AGE AT DEATH CAUSE OF DEATH				HOME CONDITIONS—LIGHT GOOD FAIR POOR VENTILATION GOOD FAIR POOR			
				OVERCROWDING YES NO CLEANLINESS GOOD FAIR POOR ORDERLINESS GOOD FAIR POOR			
				REFERRED TO HOSPITAL _____ RESULT _____			
				RELIEF AGENCIES _____ RESULT _____			
				URINE DATE EXAM. _____			
				SP. GRAV. _____			
				ALBUMIN _____			
DEPARTMENT OF HEALTH		CITY OF NEW YORK		BUREAU OF CHILD HYGIENE		PRE-NATAL CARE CARD	
				DIVISION OF BABY WELFARE			

of childbirth which mean invalidism for the mothers and loss of breast milk which is the baby's right. The statements made above are a serious indictment of any community, however progressive it may be in other respects, and we must either plead guilty and take the consequences, or, by promise of a speedy adjustment and change, hope to escape with a suspended sentence.

It is apparent that the high infant mortality rate during the first month of life bears little relation to errors of hygiene and diet of the child, but is attributable to conditions operating before, during, or shortly after the birth of the child. With a pro-

keep in touch with these newborn babies, in so far as it is possible with a migrating population such as we have in New York, until they are one year of age. An outline of the organization, methods, accomplishments, possibilities and needs of this important work, as it applies to New York, is submitted in the hope that it will lead to constructive improvements for and by all interested individuals and organizations.

The instruction and supervision of expectant mothers centres around the baby health stations of the Department of Health, of which there are fifty-nine in the Greater City. Each of the eight

department is prepared to do so. If no attendant has been engaged, the nurse urges the mother to place herself under the care of a private physician or, if unable to pay, under the care of a recognized maternity hospital or institution. Before the birth of the child, visits are made, in normal cases, every three weeks up to the fifth month of pregnancy, and then every ten days until delivery. In abnormal cases, visits are made as frequently as necessary. After the birth of the child, visits are made every two days for a period of one week in normal cases, and then every five days until the end of the month. In abnormal cases, visits are made as frequently as the cases demand. At the end of the month, or at the termination of the case, every effort is made to persuade the mother to continue nursing the baby and to enroll it at the nearest baby health station, provided no private physician is in attendance. In this way the baby is brought under a continuation course of instruction and under influences which make for better and healthier mothers and babies. The nurse in charge of the baby health station is informed by the prenatal nurse of the termination of the case, in order that she may follow it up if

[illegible]

It is a fundamental policy of the Department of Health that efforts should be made to see the expectant mothers as early in pregnancy as possible and to urge them to place themselves under proper medical care at the earliest possible moment. In every instance where the expectant mother is under the care of a private physician, midwife, or institution, the nurse communicates with one or the other and explains the desire of the department to co-operate and the manner and degree in which the

With the consent and understanding of the physician or institution in charge, nurses instruct mothers *ante partum* as regards general home conditions, diet, clothing, exercise, rest, ventilation, bathing, care of the teeth and breasts, general physical and mental condition, arrangements for confinement, placing special emphasis upon the advisability and desirability of maternal nursing, and, *post partum*, as to the importance of maternal nursing, care

of the eyes, sleep, regular feeding, milk modification, etc., urging the mother to follow carefully the physician's directions. With the consent of the physician or institution in charge of the case, or at their request, examinations of the urine, to detect the presence of albumin, are made at least once a month up to the sixth month of pregnancy and then every ten days or more frequently. If, before the birth of the child, there are any significant signs or symptoms which indicate danger, such as severe and persistent vomiting, pronounced and constant headache, swelling of the legs, scanty urine, muscular twitching, convulsions, bleeding, etc., the nurse communi-

nosis. Positive findings in these instances lead to securing proper care and treatment.

Each nurse is expected to familiarize herself with the list of hospitals and clinics in which deliveries are conducted, either in the hospitals and in the homes, in the hospitals only, or in the homes only. In fact, each nurse is provided with a booklet compiled by the Babies' Welfare Association, entitled *Information Concerning the Hospital and District Maternity Service of New York City*. Whenever indicated, these nurses accompany expectant mothers to hospitals, dispensaries, maternity clinics, etc., for examination, treatment, or advice. Special emphasis is placed upon securing the goodwill and co-operation of physicians, institutions, and midwives in attendance and in communicating with them in all matters bearing upon the cases. In obtaining the history of each case, attention is given to the conditions existing at previous pregnancies, as instrumental deliveries, premature births, prolonged labor, unusually large child, convulsions, and stillbirths, and arrangements are made for early and frequent *ante partum* examinations and measurements. The nurses are familiar with and keep in touch with the various charitable and relief organizations and workers, for the social service activities connected with this phase of the work are frequently pressing. The question of relief, however, is kept in the background as much as possible, but whenever assistance is required, no effort is spared to secure it promptly. The rights of the midwife in attendance are not encroached upon nor is any criticism of her work made to the mother. Any errors on her part, which are infractions of the rules and regulations under which a permit to practise is given her and which occur before or after the birth of the child, are reported to the chief of the Division of Midwives and Foundlings, through whom the necessary action is taken. Mothers are always urged, as before noted, to place themselves under medical care, but if they express preference for a midwife, they are referred to midwives who are known to be graduates of the recognized school in this city, the Bellevue Hospital School for Midwives. Mothers are instructed as to the importance of having attendants at birth use eye drops immediately after the birth of the child. In addition to personal instruction, the nurse distributes literature bearing upon the care of the mother and baby. In the presence of danger signals and pending the arrival of medical assistance, which is recommended and arranged for at once, the following suggestions are given: Severe vomiting: Put the mother to bed; stop all food and advise ice pellets, zoolak, kumyss, cool milk, and vichy. Severe headache: Put mother to bed; water and milk diet. Swelling of legs, especially when associated with puffiness of eyelids, diminished urine, and headache: Put to bed; elevate legs; milk diet. Fainting spells: One half teaspoonful of aromatic spirits of ammonia in wineglass of water. Scanty urine: Put to bed; milk diet; plenty of water. Albumin in urine: Put to bed; milk diet; plenty of water; no meat, eggs, or other albuminous food. Convulsions: See that patient does not injure herself. Keep her from biting her tongue by inserting a tongue depressor, brush handle, or spoon between teeth; keep the room dark-

QUARTER ENDING		MILK STATION	
122 X 15 16,500 (17)			
NUMBER OF CASES PENDING AT BEGINNING OF QUARTER			
NEW CASES REGISTERED DURING QUARTER			
TRANSFERRED CASES REGISTERED DURING QUARTER			
TOTAL CURRENT CASES FOR QUARTER			
OF WHICH—			
CASES TRANSFERRED TO OTHER H. O. STATIONS			
CASES " " ORGANIZATIONS			
CASES LOST SIGHT OF			
CASES DIED BEFORE CONFINEMENT			
CASES CONFINED			
CASES PENDING AT END OF QUARTER			
TOTAL			

CONFINED CASES—PERIOD UNDER OBSERVATION BEFORE CONFINEMENT												
8 MOS.	7 MOS.	6 MOS.	5 MOS.	4 MOS.	3 MOS.	2 MOS.	1 MO.	NOT STATED	TOTAL			
MOTHERS CONFINED—												
BY PHYSICIAN IN HOSPITAL									SURVIVED	DIED IN OR AFTER CONFINEMENT	TOTAL	
" " HOME												
" MIDWIFE												
NO ATTENDANT												
TOTAL												

INFANTS—REGISTER		
NUMBER LIVING AT END OF FIRST MONTH		
" DIED DURING FIRST WEEK		
OTHERS " " MONTH		
NUMBER OF STILLBIRTHS		
" MISCARRIAGES		
TOTAL		

INFANTS—FEEDING RECORD AT END OF FIRST MONTH		
BREAST FED ENTIRELY		
MIXED FEEDING		
ARTIFICIAL FEEDING ENTIRELY		
NO FEEDING		
TOTAL		

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cates immediately with the physician or institution in charge of the case. If there is no physician in charge, and if the patient is unable to pay for medical advice, the nurse communicates with the nearest maternity hospital, general hospital, dispensary, or ambulance service, and arranges for proper disposition of the case. If the nurse suspects the existence of syphilis, tuberculosis, or gonorrhea, she refers the case to the private physician in charge or to the nearest hospital or dispensary. In case of suspected syphilis not under medical care, the mother is referred or accompanied to the Wassermann Clinic of the Department of Health for blood examination, a report of which is forwarded to the nurse through the chief of the Division of Baby Welfare. Suspected tuberculosis not under medical care is referred to one of the tuberculosis clinics of the department and in suspected gonorrhea, smears are taken and sent to the department for corroborative diag-

ed and quiet; give hot saline enema and hot packs. Bleeding: Put to bed, raising foot of bed; apply tight vulva pad.

The orders of the physician or midwife attending the case are not interfered with in any way. The nurse's visits are purely friendly and advisory, and mothers are urged to follow the instructions of the physician implicitly. Nurses do not prescribe medication of any kind whatsoever. Should any indication for simple medication arise, the case must be referred to the physician in attendance or, if no attendant has been engaged, to the medical inspector on duty at the baby health station. The prenatal nurses are expected to develop, as far as possible, sewing classes at which expectant mothers are instructed in the preparation of baby outfits and articles for the coming delivery at a minimum cost. Expectant mothers are also instructed in the proper selection, preparation, and cooking of food from the standpoint of economy and of nutrition. As a check upon unlicensed midwives, the nurse is expected to secure the name, address, and floor of the midwife in each case of confinement coming to her attention, and report the same to the central office of the department.

The Sanitary Code of the Department of Health provides that all cases of sore eyes found in babies attended by midwives must be reported to central office of the department in order that proper care may be provided for the infants and that investigation may be made as to the use of silver nitrate immediately after delivery. The health of the mother is safeguarded in that, through the Babies' Welfare Association, arrangements are made where necessary to send her to a convalescent home prior to and after delivery or to provide for daily visits by a settlement nurse shortly after labor or when convalescence is slow, and for such period as the needs of the case demand. Occasionally, through this association, arrangements are made for nurses from the Henry Street Settlement to assist the physician at the time of labor. In case a mother about to be delivered in an institution or hospital has other young children, the latter are placed in a temporary shelter or nursery pending the mother's return. This assures peace of mind to the mother and does away with difficulties not infrequently encountered when these children are sent, through the Society for Prevention of Cruelty to Children, to city institutions, in which case the mother often does not realize her responsibility upon her return home. Arrangements have been made with a large number of maternity hospitals to refer to the baby health stations nearest the home addresses, mothers and babies discharged from these institutions. Similar cooperation has been afforded by various nurses' settlements, which send to the nearest baby health stations the mothers and babies who have been discharged from their care after delivery.

The Division of Midwives and Foundlings of the Bureau of Child Hygiene receives from each midwife a quarterly list of the mothers delivered by her. The names and addresses of these women are forwarded to the nurses of the respective baby health stations for follow up, and in this way a large number of infants in the early period of their

existence are brought under the educational influences of the baby health stations. All stillbirths reported by midwives are investigated by physicians of the Bureau of Child Hygiene of the Department of Health, and, wherever possible, the cause of the stillbirth is ascertained. If such cause appears to be due to conditions which may be remedied, as syphilis, overwork, diseased annexa, or retroflexion, the mother is revisited by a nurse, advised of these conditions in their relation to future pregnancies, urged to place herself under treatment, and to inform the nurse if she becomes pregnant again. In passing, it may be noted that in connection with the stillbirth investigation, the inspector ascertains if the mother is able and willing to act as wet nurse. The names of those signifying assent are registered with the Babies Welfare Association, which acts as a clearing house for all child welfare agencies in the city, and in this way a number of women are placed at the disposal of physicians who stand in need of wet nurses in their cases.

In an effort to secure an increased enrollment of expectant mothers, the midwives of the city have been requested by the special corps of nurses assigned to their supervision and by circular letters signed by the commissioner of health, to submit the names and addresses of the prospective mothers under their care in order that the latter may be given the necessary prenatal instruction and advice. Assurance is given them that no attempt will be made to interfere with the rights and privileges granted them under their permits to practise. The response of the midwives has been most gratifying and a large number of these mothers have been brought under the guiding influence of the nurses of the baby health stations. The compulsory notification of pregnancy, advocated in many quarters, has many manifest disadvantages, and a middle course, such as above noted, has been found both practical and efficacious.

This, in the main, covers the organization of the instruction and supervision of expectant mothers, as conducted by the nurses specially assigned to this work. In addition to this, all nurses of the baby health stations advise expectant mothers as they meet them at the stations, or in their visits to the homes. In fact, all nurses of the Bureau of Child Hygiene, when making domiciliary visits for any purpose whatsoever, not only advise expectant mothers as to personal and home hygiene and care, but also make every effort to see that they are placed under proper medical supervision. The follow up here is of necessity not so complete as in the case of the special nurses. The latter are engaged in this work exclusively, while the regular baby health station nurses are taken up with the larger activity of the care of some 48,000 babies under two years of age annually. With so small a force for the special instruction and supervision of expectant mothers, it follows that the number under careful supervision must be correspondingly small. In a city like New York, with some 137,000 children born during the year and with over one third of these brought into the world by midwives, we do not profess to be able to do more than scratch the surface of this problem. Our limitations under such

circumstances are easily understood. Any ultimate good in the control of congenital diseases must come through the education of the public as to the importance of the subject. All the Department of Health can do is to indicate the great need, outline a plan of organization, correlate existing facilities, show what a limited force has accomplished, and hope that in the future an increased corps of nurses will be provided so that the opportunities offered by the department will be increased and that other agencies will become sufficiently interested to take up this activity. Despite the limited force at our disposal, the results which have been accomplished during the past three years are most gratifying and encouraging, and indicate what might be expected if it were possible, either through municipal means, through public education or through the unified efforts of maternity hospitals and child welfare agencies, to reach the large number of expectant mothers who stand so sorely in need of guidance. The following tabulation will show at a glance a summary of this special work for the years 1914, 1915, and 1916:

SUPERVISION OF EXPECTANT MOTHERS.

TABLE I.

	1914	1915	1916
Number of mothers supervised	1,622	2,382	3,092
Number of mothers delivered	868	1,442	1,841
Percentage of mothers delivered	55.3	58.9	61.4
Number of mothers who died	2	0	2
Number of nurses	7	9	24
Average number of mothers supervised by each nurse	231	354	375

TABLE II.

	1914		1915		1916	
	Number	Percentage	Number	Percentage	Number	Percentage
Total number of mothers delivered	868	100	1,442	100	1,841	100
By midwives	574	66	592	61.9	1,035	56.2
By physicians at home	243	27.9	431	29.8	495	27.0
By physicians in hospitals	76	8.5	106	7.4	307	16.7
Unattended	5	.5	13	.9	14	.8

TABLE III.

	1914			1915			1916		
	Number	Rate per 1,000 children born	Ct. rate per 1,000 children born	Number	Rate per 1,000 children born	Ct. rate per 1,000 children born	Number	Rate per 1,000 children born	Ct. rate per 1,000 children born
Number of children born, including twins	990			1,653			1,853		
Number of living children	866	965.6	955.1	1,385	952.2	956.6	1,746	942.8	956.6
Of which the following were premature	13	14.1		14	9.6		15	8.1	
Stillbirths (all periods of gestation)	31	34.1	11.9	68	46.8	43.4	106	57.2	42.4

TABLE IV.

	1914	1915	1916
Number of mothers delivered	868	1,442	1,841
Under observation for 8 months	10 (1.2%)	51 (3.5%)	95 (5.2%)
Under observation for 6 months	46 (5.3%)	100 (7.0%)	180 (9.8%)
Under observation for 4 months	74 (8.5%)	111 (7.7%)	194 (10.6%)
Under observation for 3 months	94 (10.7%)	130 (9.0%)	224 (12.2%)
Under observation for 2 months	131 (15.1%)	200 (14.0%)	250 (13.6%)
Under observation for 1 month	136 (15.6%)	231 (16.0%)	266 (14.4%)
Under observation for 2 months	191 (21.9%)	265 (18.4%)	304 (16.5%)
Under observation for 1 month	189 (21.8%)	309 (21.4%)	272 (14.8%)
Indefinitely stated	15 (1.7%)	42 (2.9%)	57 (3.1%)

TABLE V.

	1914	1915	1916
Number of living infants born	869	1,385	1,746
Number of deaths during first month	17	37	24
Rate per 1,000 living births	19.5	26.6	13.7
Cite rate per 1,000 living births	36.6	35.0	30.7

TABLE VI.

	1914		1915		1916	
	Number	Percentage	Number	Percentage	Number	Percentage
Infants living at end of first month	862	100	1,347	100	1,722	100
Infants entirely breast-fed living at end of first month	797	92.5	1,205	94.5	1,622	94.2
Infants nursed breast and bottle living at end of first month	46	5.4	59	4.1	72	4.2
Infants entirely artificially fed at end of first month	9	1.1	17	1.4	28	1.6

The mothers supervised comprise for the most part poor mothers of foreign extraction and of various races, mainly German, Russian, Austrian, Irish, Italian, Negro, and Polish. Thirteen per cent. were Americans and eighty-seven per cent. of other races, divided as follows: Italian, fifty-eight per cent.; Austrian, eleven per cent.; Russian, ten per cent.; Irish, four per cent.; Negro, two per cent.; Polish, one per cent.; German, one per cent. There were few people of moderate means among this number. This should not, however, convey the impression that this class does not need supervision during the period of pregnancy. The mothers of moderate means, as well as the rich, require quite as much attention, perhaps even more than do the poor. In point of fact, an analysis of the deaths of infants, by small sanitary districts or census tracts, has shown that the infant mortality rate from congenital diseases is greater among the rich than among the poor. "It is rather noteworthy that in some of the districts peopled by persons of considerable means the death rate from congenital malformations and defects is considerably higher than in the poorer quarters of the city. Just why this is has not yet been determined. It may be a matter of racial peculiarity; it may be attributed to hereditary causes, or possibly due to acquired causes. It has also been suggested that the age at which people married might be the deciding factor. It is generally agreed that the well to do marry later than do the poor" (1). If we presume that practically all the mothers delivered by midwives—46,487 in 1916—should receive prenatal care, and add to this a goodly proportion of those delivered in institutions, and by physicians in private practice, it will be no exaggeration to say that 75,000 mothers annually stand in need of such service. An analysis of the above tables shows clearly what concerted action along prenatal lines can accomplish. Witness that the number of mothers supervised, the number of mothers delivered, and the average number of mothers supervised by each nurse have increased from year to year, that the number of mothers who died has been insignificant, and that the percentage of deliveries by midwives has decreased from sixty-four per cent. in 1914 to 56.2 per cent. in 1916, showing the education of the public as to the need of medical care.

The number of children born prematurely has decreased from 11.1 per 1,000 children born in 1914 to 8.1 per 1,000 children born in 1916. The still-birth rate for the city appears lower than that for this special work, but this is apparent rather than real, since it must be remembered that the term "still-birth" as used in this report refers to the product of conception expelled from the uterus, dead, at any

period of uterogestation, and that under these circumstances the number of stillbirths reported officially to the Department of Health is far smaller than those which actually take place. This is particularly true in view of the general conception of a stillbirth, that is, the product of conception expelled from the uterus at a viable age which does not breathe or cry.

The stillbirths recorded in this tabulation represent actual figures, since all the mothers are under careful observation. If, as has been estimated, one stillbirth occurs for every four living births, then the number of stillbirths occurring in New York during 1916 would have been, with the 137,000 living births, approximately 35,000, instead of some 6,253, the basis upon which the city stillbirth rate for 1916 was recorded. It is fair to assume that 35,000 stillbirths for the city of New York, in the sense above noted, is a conservative estimate. It will be noted that there was an increased enrollment of mothers at the fifth month of pregnancy, increasing from thirty-seven per cent. in 1914 to forty-two per cent. in 1915 and fifty-one per cent. in 1916. The death rate during the first month of life per 1,000 living births declined from 19.5 in 1914 to 13.7 in 1916, while the city rate per 1,000 living births practically remained stationary during these years. Finally, it is evident that the percentage of babies entirely breast fed at the end of the first month has been kept at a high standard, and the number of babies artificially fed at this period has been kept correspondingly low.

(To be concluded.)

WASSERMANN COMPLEMENT FIXATION TEST FOR SYPHILIS.

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II

THE HEMOLYTIC SYSTEM.

The Wassermann complement fixation test consists of two systems, namely, the first, or lipodotropic, system; and the second, or hemolytic, system. Each system is made up of three elements: the first system: antigen; antibody; complement; the second system: antigen; amboceptor; complement. In order to appreciate the significance of the term "complement fixation" it is necessary to consider what is meant by complement and to review in a brief way the original experiments in the fixation of complement.

Nuttall (1) in 1888 reported a series of experiments concerning the antibacterial power of the animal body. He reviewed the work which Metchnikoff reported in 1887, tending to prove the dependence of immunity upon phagocytosis. Nuttall pointed out that bacilli mixed with blood and other body fluids undergo a morphological degeneration, quite independent of the action of the leucocytes. He demonstrated that a large proportion of the bacilli so mixed with the body fluids were killed in a relatively short time. Nuttall expressed the opinion that Metchnikoff's assertion that the destruction of

bacteria in the living body comes to pass exclusively through the activity of phagocytes, stands unproved in the light of his researches. In 1889, Buchner (2) investigated the bactericidal effect of cell free blood serum. He confirmed the work of Nuttall. In 1890, Buchner and several coworkers (3) reported a series of elaborate investigations concerning the antibacterial action of the blood and blood serum and the nature of the bactericidal substance of the blood. He called the active constituent of the blood "alexin," a word derived from the Greek, *alexo*, meaning to ward off. He found it to be thermolabile, being destroyed at 55° C. within one hour. In 1894-95 Pfeiffer (4) demonstrated the development of specific protective substances in the blood of animals inoculated subcutaneously with living or dead cholera spirilla or typhoid bacilli. He showed that when the serum of an immunized animal is mixed with a suspension of the bacteria to which it is immune and the mixture injected into the peritoneal cavity of a nonimmunized guinea pig, a peculiar phenomenon occurs. By removing small portions of the fluid from the peritoneal cavity at frequent intervals it is possible to observe the gradual dissolution of the bacteria. The process requires one half hour or less, depending upon the degree of immunity of the animal whose serum is employed. This phenomenon, bacteriolysis *in vivo*, has since been called the Pfeiffer phenomenon.

Bordet (5) showed in 1895 that it is not necessary to employ the peritoneal cavity, but that the reaction might be done in the test tube by combining immune serum, bacteria, and the fresh serum from an untreated animal. He showed that such fresh serum, although in itself without effect upon the bacteria, when added to old immune serum which had lost its power through age, activated the immune serum, rendering it again bactericidal. It was thus demonstrated that two substances are necessary to bacteriolysis—a specific substance, developed in the blood of an animal by immunization with a particular bacterium, and a nonspecific substance which is normally present in fresh blood. Bordet (6), Ehrlich (7), and others established the fact that the alexin of Buchner was really a mixture of these two substances. The stable, specific immune body is variously called "antibody," "sensitizer," or "amboceptor"; the labile element, found universally in fresh blood, whether of an immunized animal or of a nonimmunized animal, is called "complement" or "alexin."

Immune bodies are produced in response to parental introduction not only of bacteria, which are essentially, in the phrase of Vaughn (8), "particulate protein," but also of any protein, either formed or unformed. Thus, red blood cells may serve as antigen or eggwhite may act to stimulate the production of a specific antibody. Complement is nonspecific. It acts to complete any antigen amboceptor combination. It is a normal constituent of blood serum. It is more abundant in some serums than in others. Noguchi and Bronfenbrenner found that guinea pig complement is best adapted for complement fixation tests (9). Complement itself is not isolated from the serum, but the serum containing

complement is used. This serum is spoken of colloquially as complement.

Blood for use as complement is readily obtained from the guineapig in one of several ways. The external jugular vein may be exposed by a small incision and blood removed therefrom by aspiration. Frequently sufficient blood can be had from the ear of a large pig, if it is rubbed with xylol and incised at the margin. The animals may be

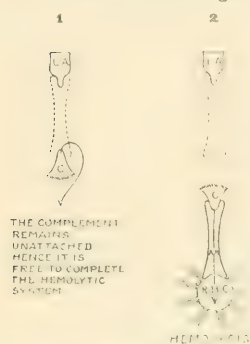


FIG. 1.—Schematic representation of Wassermann reaction in a non-syphilitic.

because the same pig may be bled many times, provided that a rest of three weeks be allowed between bleedings; it is humane because the pig is carefully anesthetized before being punctured; it is expeditious, requiring very little time and trouble; it is effective, inasmuch as it is an exceedingly simple matter to remove five c. c. from a small pig, and not at all difficult in the case of a large pig to obtain as much as fifteen c. c. of blood. The procedure, in outline, is about as follows: Three or four pigs are put into a box with a piece of cotton saturated with ether. The box is covered tightly until the pigs begin to exhibit the effects of the anesthetic. One of them is then removed and strapped to a board by its legs, ventral side up. The cover of the box is replaced so as to allow a limited interchange of air, thus maintaining a light anesthesia in the waiting pigs. The tied pig is rapidly clipped and shaved over the precordium and the skin washed with alcohol. Surgical anesthesia is then induced. A small, hollow needle of the standard Luer type—gauge, 18; length, one inch—is attached to the bleeding tube which has been described by Dr. R. M. Taylor (10). The needle is sterilized in paraffin oil and the tube is dry sterilized. The point of maximum cardiac impulse is then located. It is usually midway between the suprasternal notch and the ensiform and one fourth inch to the left of the sternum. The needle is entered by a quick, stabbing movement, directly downward. Two precautions to be observed at this point are to support the thorax firmly with the free hand and to go in only so far as to enter the heart, but not to transfix it. If the thorax is not firmly supported the needle displaces the chest wall as it impinges upon it. Thus the puncture is made more difficult and the needle enters at a point at which it was not originally in-

tended that it should enter. It may thus miss the heart altogether. If the needle is pushed through the heart, that organ in its contractions invariably tears itself upon the needle and the animal dies with hemopericardium or hemothorax or both.

If the puncture is properly made one may draw off from five to fifteen c. c. of blood depending upon the size of the pig. Usually it is well to draw only from three to six c. c. from each pig, for the reason that when the serums of several pigs are pooled, the mixture provides a more uniform complement than that prepared from a single specimen of blood. When the desired amount of blood has been drawn into the bleeding tube, the needle is withdrawn by a rapidly executed upward movement at the wrist. The blood is then blown out into a sterile Petri dish and refrigerated. It is well to bleed the pigs late in the afternoon and leave the specimens of blood in the icebox over night. With such treatment, sufficient clear serum always exudes and is immediately available in the morning. The blood may be defibrinated by whipping, or the clots broken up with a glass rod and either of the resultant preparations centrifuged. Usually this procedure is quite satisfactory. Whatever the method employed, it should result in the preparation of a cell free, hemoglobin free serum. This is packed in ice and kept in the refrigerator, being taken out only just before use and returned as soon as possible after use. The reason for handling complement so carefully is that complement is thermolabile. It is totally destroyed at 56° C. in fifteen to thirty minutes and it deteriorates exceedingly rapidly at room temperature. If left over night at room temperature it becomes quite unfit for use. Even when kept in the icebox, at 8° C., it becomes unsuitable for use as a rule after forty-eight to sixty hours.

Different specimens of guineapig serum have different contents of complement. However, as already mentioned, a mixture of the serums of several pigs, three to six, is approximately the same in its complement strength as any other similar mixture. The variations are within rather narrow limits. This is so generally true that many workers employ an arbitrary dose of complement in their tests. Undiluted guineapig serum is not ordinarily employed for complement. Usually it is used in a ten per cent. solution. When one employs the one fifth Wassermann test, i. e., total volume of the test, one c. c., it is quite safe to assume that approximately 0.1 c. c. of the ten per cent. solution is the unit quantity of complement. It is not our custom

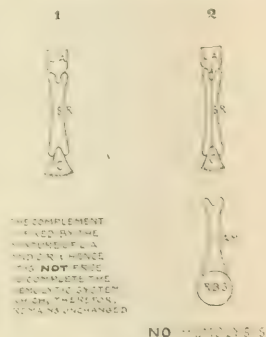


FIG. 2.—Schematic representation of Wassermann reaction in a syphilitic.

to use an assumed unit of complement, however, except for the single purpose of titrating a new amboceptor serum. On the contrary, the complement is titrated each day, with constant units of antigen and amboceptor, to determine the strength of it, and hence the quantity to be used in the tests.

Before we can intelligently consider the subject of the titration of the complement, it will be necessary to enter into a brief discussion of the other elements of the hemolytic system, to wit, the antigen and the amboceptor. The antigen of the hemolytic system is the red blood cell. Commonly the red blood cell of the sheep is employed. Noguchi (11) advocated the use of the human erythrocyte. The justification for this modification is in the fact that many normal human serums contain hemolytic amboceptors for sheep red cells. Ordinarily, however, little if any attention is paid to the so called "native amboceptor." When it appears necessary it may be absorbed by incubating the inactivated serum with an excess of sheep's red blood cells. It may be advisable to absorb the native amboceptor of a serum when the Wassermann reaction is persistently negative and all other evidence favors a diagnosis of syphilis. Sheep's blood is not difficult to obtain. One may send to an abattoir for defibrinated blood or one may keep a sheep in the laboratory. It is a simple matter to remove a small quantity of blood from the jugular vein of a sheep, or one may simply clip off the very tip end of the tail and collect the blood as it drops. It is our custom to obtain the blood at the slaughterhouse. It is collected in a sterile glass bottle having a ground glass stopper and containing several glass beads. The blood is immediately defibrinated by shaking it vigorously, whereupon the fibrin collects about the glass beads. The red cells are thus left suspended in serum. In that state the blood is brought to the laboratory. The fluid portion is decanted into medium sized centrifuge tubes and centrifuged to separate the cells from the serum.

The next step is the washing of the sediment of cells with 0.9 per cent. salt solution. This is done either by pouring the sediment of cells into another tube containing salt solution and then pouring back and forth several times, or by means of a bulb pipette, alternately sucking up from the bottom and blowing out at the top. The cells once washed are then centrifuged again, this time for a very definite length of time and at a very definite number of revolutions a minute. It is our custom to run the centrifuge for fifteen minutes at 1,500 r. p. m. If the supernatant fluid is clear and colorless it is unnecessary to wash the cells again. However, ordinarily several washings are required to remove all the serum and the hemoglobin derived from disintegrated cells. The final sediment is called "packed cells" and is considered to be 100 per cent. r. b. c. It is used as a basis for the preparation of the two suspensions employed in serological procedures, five per cent. and fifty per cent.

The amboceptor, or, as it is variously called, hemolysin, hemolytic antibody, sensitizer, in contradistinction to complement is a highly specific immune body. It must correspond exactly with the antigen employed. If one uses sheep cells he must employ antisheep amboceptor; if human cells, anti-

human amboceptor. The ordinary Wassermann amboceptor, or "ambo," as it is colloquially termed, is contained in the serum of a rabbit which has been immunized to the sheep's red blood cells by a series of parenteral injections. A full grown healthy rabbit is given a series of three parenteral—usually intravenous, not uncommonly intraperitoneal—doses of a fifty per cent. suspension of the red cells of the sheep. The marginal vein of the ear is ordinarily chosen for the injections. The second and the third dose is each preceded by a desensitizing dose. If the desensitizing dose is not employed the animal occasionally dies in acute anaphylaxis after the second dose and very frequently does so after the third dose. The employment of the small preliminary dose obviates this unfortunate occurrence. The doses and the intervals are shown in the following typical protocol,

TABLE I.
TYPICAL PROTOCOL OF AMBOCEPTOR RABBIT.
Clinical reaction

<i>Date</i>	<i>Dose</i>	<i>Clinical reaction</i>
June 29, 1917	5 cc.	None.
July 3, 1917	11 A. M. 0.5 cc. 1 P. M. 5 cc.	Slight restlessness. None.
July 6, 1917	11 A. M. 0.5 cc. 1 P. M. 5 cc.	Restlessness; involuntary urination, and defecation. None.

After the last dose the animal is permitted to rest for ten days. It is then strapped to a board, clipped, shaved, and etherized just as is the guinea-pig when subjected to heart puncture. The apparatus for bleeding the rabbit is a modification of the tube used for bleeding guinea-pigs. It is described by Doctor Taylor (10) as follows: "The needle, instead of being attached directly to the tube, is joined to it by means of a rubber connection. This is done so that when the desired amount of blood is drawn, the rubber may be clamped. In this way, subsequent defibrination may be performed or the serum allowed to separate by clotting in the original receptacle." Fifty to sixty c. c. of blood are drawn and defibrinated by whipping with a sterile glass rod. The blood is then centrifuged rapidly for thirty minutes to an hour and the cell free serum is removed aseptically and refrigerated in a sterile container. The ambo content of such a serum is, of course, an unknown quantity. Unlike the complement content of guinea-pig blood, which is remarkably constant, the ambo contents of different specimens of immune rabbit serum are widely different. Therefore it becomes necessary to titrate each new ambo to determine its strength. On the other hand, the ambo content of any particular specimen of immune rabbit serum remains very much the same over a long period of time. Ambo resists heating at 56° C. for thirty minutes, and if a specimen of serum so heated is then sealed in a sterile ampoule and kept in the icebox, its strength remains undiminished for years.

Let us now consider the very important matter of the titration of the various elements of the hemolytic system to determine the unit quantities. The original Wassermann reaction was done in a test the total volume of which was five c. c. One c. c. of a five per cent. suspension of sheep's cells constituted the unit quantity of antigen of the hemolytic system. Relatively the same unit is employed today. Thus in the one half Wassermann—total

volume, two and one half c. c.—the unit quantity of r. b. c. is 0.5 c. c. of a five per cent. suspension. In the one fifth Wassermann—total volume, one c. c.—0.2 c. c. of a five per cent. suspension is the unit quantity of r. b. c. This is purely arbitrary. Inasmuch as the cells are prepared in exactly the same way time after time, 0.2 c. c. of a five per cent. suspension contains approximately the same number of red blood cells one time as the next. Thus is established a fixed point from which to proceed. The next step is to determine the unit quantity of ambo. As has already been pointed out, in the titration of ambo it is safe to assume the unit of complement. Then by mixing various quantities of ambo with constant quantities of r. b. c. and complement, and then incubating under suitable conditions, one arrives at a determination of the unit of ambo. The titration of ambo is performed in the following manner: A small portion of the immune rabbit serum is inactivated by heating at 56° C. for thirty minutes. Three dilutions of the serum are made to wit, 1:100, 1:500 and 1:1000, in 0.9 per cent. salt solution. Then each dilution is employed in gradually increasing amounts, beginning with 0.01 c. c. and running up to 0.2 c. c. With each different quantity of ambo are mixed unit quantities of r. b. c. and constant quantities of complement—assumed unit, 0.1 c. c. of a ten per cent. solution of complement—and the mixtures are incubated at 37° C. for thirty minutes. The following scheme, Table II, depicts such a titration:

TABLE II.
TITRATION FOR UNIT OF AMBOCEPTOR.

Ambo, . . . . .	.01	.02	.03	.04	.05	.06	.07	.08	.09	.1	.12	.14	.16	.18	.2
Salt sol., . . . . .	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5
Complement, . . . . .	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1
R. b. c., . . . . .	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2
Controls:															
Ambo, . . . . .	.0	.2	.0												
Salt sol., . . . . .	.6	.6	.8												
Complement, . . . . .	.2	.0	.0												
R. b. c., . . . . .	.2	.2	.2												

Incubate thirty minutes and read degrees of hemolysis, as estimated by the eye.

The smallest quantity of ambo which suffices to permit of complete hemolysis of one unit of r. b. c. by one unit of complement in a unit quantity of time is the unit quantity of ambo. Thus, let us suppose that 0.07 c. c. of the 1:1000 dilution suffices. Then, by proportion: 0.07 : 0.1 :: 1000 : x . x is 1428, or approximately 1,500. Therefore, 0.1 c. c. of a 1:1500 dilution of the ambo serum is the unit quantity of ambo.

The unit is determined upon a small portion of the serum. If the strength of the serum is sufficient to allow of its being used—if the unit quantity is not greater than 0.1 c. c. of the 1:1000 dilution—the rest of the serum is inactivated, sealed in sterile ampoules and stored in the icebox. Each ampoule is marked with the date of preparation, the nature of the contents, and the unit quantity thereof. Each new specimen of complement is then titrated against the arbitrary unit of r. b. c. and the established unit of ambo. For purposes of titration a small quantity of guineapig serum is diluted 1:10 in salt solution. It is then tested as in the scheme, Table III.

The smallest quantity of complement which suffices to effect complete hemolysis of one unit of

r. b. c. sensitized with one unit of amboceptor in a unit quantity of time is the unit quantity of complement. Complete hemolysis usually occurs with 0.1 c. c. in thirty minutes and not infrequently with 0.08 c. c. or even 0.06 c. c. If the unit quantity is 0.1 c. c., a ten per cent. solution is employed in the tests. If the unit quantity is 0.08 c. c., an eight per cent. solution is used, for 0.08 c. c. of a ten per cent. solution is equivalent to 0.1 c. c. of an 0.8

TABLE III.

TITRATION FOR UNIT OF COMPLEMENT.

Comp. 10% . . . . .	.1	.04	.07	.05	.7	.08	.09	.1	.12	.14	.16	.18	.2
Salt sol., . . . . .	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5
Ambo, . . . . .	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2
R. b. c., . . . . .	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2
Controls:													
Comp., . . . . .	.2	.2	.2	.2									
Salt sol., . . . . .	.6	.6	.6	.6									
Ambo, . . . . .	.2	.0	.0										
R. b. c., . . . . .	.2	.2	.2										

Incubate thirty minutes and read degrees of hemolysis, as estimated by the eye.

per cent. solution. Thus, likewise, if 0.06 c. c. of the ten per cent. solution is unit quantity, 0.1 c. c. of a six per cent. solution is also unit quantity. Inasmuch as it is far more convenient to measure 0.1 c. c. quantities than fractions of 0.1 when running a series of tests, the unit quantities are expressed in the manner outlined above. It is apparent that when one mixes unit quantities of r. b. c., ambo and complement and puts the mixture in an incubator at 37° C., complete hemolysis occurs in thirty minutes. Red blood cells, ambo, and complement comprise the hemolytic system. The complement, however, is also the third element of the first system. If it is not bound by a mixture of antigen and antibody of the first system during a suitable period of incubation, it remains free to complete the hemolytic system. Thus, in a Wassermann reaction, as in any other complement fixation test, if hemolysis occurs the complement has not been fixed in the first system, the reaction is "negative." If, on the other hand, no hemolysis occurs, complement has been fixed in the first system, the reaction is "positive."

Although we do not agree with Ehrlich's so called theory of immunity (12) which, as Bordet has pointed out (6), is not truly a theory but a collection of unproved statements masquerading as facts, nevertheless the figures employed in picturing the "theory" help one materially in forming a conception of what the reaction appears to be. Fig. 1 represents a Wassermann reaction done upon the blood serum of a nonsyphilitic. Fig. 2 shows a test upon a syphilitic. In Fig. 1 the first system is incomplete; complement is not fixed but remains free to complete the hemolytic system, with resultant hemolysis. In Fig. 2 the first system is complete; complement is fixed and cannot, therefore, complete the hemolytic system. As a result, no hemolysis occurs.

The hemolytic system may thus be considered an indicator of the fixation or nonfixation of complement in the first system. The lipodotropic system, which involves the clinically specific portion of the reaction, will be considered in another paper.

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OPERATIVE METHODS FOR THE CURE OF HEMORRHOIDS.

With a Discussion of Their Complications and Sequelæ.

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Because of conditions over which we have no control, every operative procedure, no matter how trivial, carries an element of uncertainty, and involves a greater or less degree of risk. In order that the surgeon may discharge his duty properly, he must be thoroughly familiar with the nature of those risks, and how they may be modified or avoided. Nowhere is this more important than in operations about the rectum, and nowhere is it perhaps more often disregarded, for while men would hesitate to open the peritoneal cavity unless they had experience and training, they appear to have no such scruples in work about the rectum, though many such operations require no less degree of surgical skill and judgment.

The postoperative complications and sequelæ of hemorrhoids are always very annoying and are frequently the source of acute physical suffering and mental distress, occasionally the cause of serious disability, and sometimes even an actual danger to the life of the individual. Speaking generally, it may be taken for granted that they depend in good part upon the nature of the operation, the care and skill with which it is carried out, and the thoroughness of the aftertreatment. In this paper we shall take up the various recognized methods and comment on them, though in truth, proctologists have discarded most of them. As they are still taught in medical colleges, described in textbooks, and at times practised in general hospitals, however, we shall take them up for such brief discussion and criticism as they seem to merit.

In the list which follows, we enumerate those most commonly known; all may be done under general or local anesthesia except the first, in which the technical difficulties can not be overcome except under full narcosis. For reasons which are evident, we shall not take up complications for which the anesthetic alone may be held responsible, but shall devote our attention mainly to such of them as result from special operative methods. This will enable us to display their shortcomings side by side, and thus more readily obtain a working basis for rational scientific opinion; such complications as are common to all methods follow in their order. The following is a list of the more common operations:

divulsion of the sphincter; injection with various solutions; application of caustics; electrolysis; torsion and crushing; clamp and cautery; excision with packing; excision with suture; ligation; amputation of pile bearing area.

METHODS OF OPERATION.

Divulsion of the sphincter.—There was a time when this was considered a panacea for all pathological conditions about the rectum and was accordingly employed very freely; this is true especially of the French school under the leadership of a brilliant surgeon, Verneuil, to whom credit is given for first suggesting it (1). It is plain that this measure can have but a limited application as a radical cure for hemorrhoids; it is useful when employed in properly selected cases, but useless, and even harmful, when done without proper indication. These may be found in the following conditions: 1. In what the writer would call, the prehemorrhoidal stage, there is general congestion and engorgement but no distinct tumor formation. Divulsion is a beneficial measure in these cases, because it overcomes obstruction to the return flow, equalizes the circulation, and permits the reestablishment of normal vascular function. 2. In a small and tightly contracted anus associated with obstipation, really the primary cause of the hemorrhoids. In such circumstances the patient is benefited to the extent to which we can overcome his constipation. 3. In hypertrophy of the levator ani and sphincter ani, which acts as a mechanical factor in obstructing the circulation. Whenever there is proctospasm from irritation of the parts due to fissure, sentinel pile, cryptitis, or any other painful lesion, which sets up reflex disturbances; in these cases the associated lesion must receive attention.

Divulsion is defined as the forcible rending, tearing, or rupture of an organ or a diseased part; the manner in which this operation is sometimes carried out, is convincing proof that the operator is familiar with the dictionary definition and means to carry it out to the letter. It goes without saying, that no such procedure may be carried out except with peril to the patient; divulsion as the proctologist understands it, does not consist in a tearing of the muscle, but in a stretching of its fibres until they have lost their tonicity and become thoroughly relaxed and flaccid. This must be accomplished by firm, yet gentle and even, traction which will not tear the muscle fibres and bundles nor injure the slender twigs of nerves distributed in them. It is an important procedure, which requires nice surgical judgment, based upon a knowledge of the anatomy of the muscles, and their physiological function.

The external sphincter is a thin, flat band of muscular fibres, no thicker than the blade of a small pocket knife; it is attached posteriorly to the tip and sides of the coccyx and inserted anteriorly into the central tendon of the perineum. It surrounds the anal ellipse, its most superficial fibres decussating in front and behind (2) and by their contraction approximating the edges of the anal opening, somewhat after the manner of the two halves of a pair of scissors. The internal sphincter is not

anatomically a distinct muscle, but merely a thickening of the circular muscle fibres of the gut. It is much thicker and broader than the preceding, but it is incapable itself of closing the anal canal because it has neither bony nor tendinous attachment in the tissues around it, and consequently has but poor leverage. Whenever it is found necessary to stretch the anal ring, dilatation of the sphincter should, in the writer's opinion, be accomplished by traction in the anteroposterior direction, not from side to side toward the ischial tuberosities, because force exerted in the latter direction is liable to result in tearing away the muscle from its fixed attachment, with possible incontinence, and in women, partial sagging and loss of support of the perineum from injury to the fibres inserted into the central tendon. We saw such a complication following an operation for hemorrhoids in a woman who had never borne any children, in whom no other explanation of the condition seemed possible.

Permanent paralysis from dilatation of the sphincter resulting in loss of control is happily a rare complication, but must certainly be considered. It may arise from rough, unskillful manipulations at the hands of an inexperienced operator, which traumatizes the parts excessively, ruptures the muscle fibres, tears them away from their attachments, or causes serious laceration of the nerve supply. As incontinence may occur in the course of tabs, multiple sclerosis, cysts, tumors, and destructive lesions of the cord, and it is said, even in hysterical affections, the interest of both patient and surgeon requires that a careful neurological examination precede dilatation of the sphincter, in order that any loss of function discovered after operation may not be unjustly charged to the surgeon. An illuminating example of unrecognized tabs in the course of rectal disease occurred on the writer's service in the Rectal Clinic of the Out Patient Department of the New York Hospital, on the Division of Doctor E. H. Pool.

CASE I.—The patient, a married woman of thirty-two years, presented herself at the clinic complaining of burning and purulent discharge from the rectum, pain in the lumbosacral region radiating down the left leg, straining and a frequent desire to go to stool, and a dull, heavy sensation in the pelvis. Examination disclosed the presence of a blind internal fistula, running posteriorly behind the sphincter muscle, for which operation under local anesthesia was advised. The writer was struck with the absence of the usual anal reflex, ordinarily an acutely sensitive one; further investigation showed that sensation below the middle of the sacrum was obtunded, if not entirely gone. She was sent to a neurological clinic with a diagnosis of incipient tabs, which was confirmed. She was found to have a four plus Wassermann reaction.

CASE II.—Another case in point was a patient who was about to be operated upon for an ischiorectal abscess and fistula, when it was noted that she had a partial ptosis of the left eyelid; a conference with her family physician brought out the fact that she had been suffering for years with rheumatoid pains, and had a positive blood test. Her wound healed well under intensive antiseptic treatment, but she has only partial control of the bowels, frank tabetic crises, and other unmistakable signs of spinal sclerosis.

Before leaving the subject of incontinence, it would be well to mention in this connection how such an unfortunate sequel may occur in any operation for hemorrhoids in which the sphincter is stretched, especially in the presence of external piles and a redundancy of the circumanal skin. As the

sphincter is dilated, a certain amount of swelling and edema appears in the tissues around it from traumatism, extravasation of blood, and transudation of serum, which obscures the usual landmarks, and may cause the surgeon mistakenly to cut out the groove for his ligature or clamp too far out in the substance of the muscle; he may thus amputate portions of it, or strangle it with his ligature, with consequences which may be readily imagined. Experience and sound surgical judgment are the only safeguards against the occurrence of such a mishap, but if one may be permitted to generalize, it might be set down as a safe rule in hemorrhoidectomies, not to cut away too little mucous membrane nor too much skin.

Excessive swelling and ecchymosis of the perianal soft parts occur frequently, thrombotic hemorrhoids occasionally, after stretching of the sphincter. They result, as may be inferred, from injury to the tissues and from rupture of small vascular twigs, causing considerable misery during the first few days following operation; they are preventable to some degree by avoidance of rough manipulation and unnecessary violence.

Injection with various solutions.—No treatment for the cure of hemorrhoids deserves consideration which does not comply with the formula, "safe, effective, and simple." The basis of practically all of the substances used for this purpose is carbolic acid, and no one who is familiar with the properties of this chemical and the unexpected results one sometimes gets from even very dilute solutions applied locally would regard its use as free from danger. From a peculiar sensitiveness to the drug, low resistance of the tissues, or poor circulation in the parts, it is held responsible for sloughing, phagogenic destruction, and gangrene, which are occasionally seen after its use. It is an unreliable and unsafe method despite its simplicity, which is a constant temptation to both patient and surgeon, and has been largely abandoned by the most careful men in the profession. Attempts are being made abroad to resurrect it (3), because surgeons are constantly on the lookout for less radical means to accomplish their ends, and patients likewise demand bloodless methods. The treatment does not stand up well in the early statistics which have been published, notably those of Edmund Andrews (4), who reports 3,300 cases with 184 complications, from simple recurrence to sloughing, stricture, and even death in thirteen cases. Kelsey, with an experience of 200 operations (5), is quoted by Matthews (6) as having abandoned it; the same author cites W. T. Bull as confirming its disadvantages. The writer saw a patient at the Rectal Clinic of the Post-Graduate Hospital in whom internal hemorrhoids had been thus treated three months before he came under observation: the whole of the anal canal and a portion of the lower end of the rectum had sloughed out completely, including the soft parts between the ischial tuberosities, leaving an ugly, gaping wound, which caused agonizing pain from the constant dribbling of feces over its raw surface. It was necessary to perform an inguinal colostomy to give the miserable victim respite from his suffering. The diminished resistance of

the tissues predisposes the patient to infection, local and general; hence abscess, fistula, and phlebitis are not uncommon, while recurrences are perhaps more frequent with this, than with any other method.

Application of caustics is the treatment which has been from time immemorial the Will o' the Wisp held out by the incompetent or dishonest for the cure of tumors from piles to carcinoma. A variety of substances have been advised for this purpose, among them zinc chloride, arsenic, and carbolic and nitric acids, but none of them are recommended because of any intrinsic virtue of the drug used. Any of these in sufficient concentration will destroy the pile, and probably everything else with which it will come into close contact, because these are all strong corrosives, and their action can not be limited to the site of the lesion it is desired to effect. They attack sound and diseased tissue equally and leave large, unhealthy, ulcerating areas, which sometimes cause alarming hemorrhage when in the neighborhood of large vessels. It would be hard to imagine a more crude and unscientific method, nor one so likely to be followed by chronic ulceration and stricture. The little personal experience the writer has had with it has been altogether unfavorable; the results, as seen on the patients of others, discouraging.

Crushing operation.—Conceived by Chassaignac and developed by Pollock, of London, this is carried out by grasping the pile tumors in the jaws of a powerful instrument, and destroying them either by the pressure of the clamp, or by forming a sort of a pedicle of them, which is then cut off if necessary. It has never attained much popularity. For one thing, a surgical operation is performed with a clumsy and cumbersome contrivance, which could be done more simply, neatly, and safely with knife or scissors, either of which will leave a clean wound with a minimum of traumatism to the parts. Moreover, it is liable to be followed by secondary hemorrhage if the base has not been thoroughly crushed, or if the patient strains or vomits. The writer cheerfully confesses that he has had no personal experience in the use of this treatment. He saw it demonstrated, however, to a class of students, and as the crusher was loosened, and rather hastily withdrawn by the assistant, a ribbon of tissue which was caught in it was pulled out clear down to the anal margin, resulting in a nasty laceration and considerable bleeding.

Electrolysis.—This method has been recommended by Ball and consists in the introduction of a fine needle through the tumor mass, which is connected with the negative pole of a battery, the positive being placed upon the buttock. It has never come into general use because it is suitable only for small, well circumscribed masses on account of the action of the current being defined only over a limited area, and consequently repeated punctures, which are necessarily painful, are required to destroy larger masses. Another objection to its use is that recurrences are frequent.

Excision with or without immediate suture.—Excision is the method employed for external hemorrhoids, but it is unsuitable for the internal variety if we mean to bring the edges of the wound together, because of the difficulty of properly ster-

ilizing the operative field and keeping it clean after sterilization. Localized and even more serious infection may result; it is a very simple matter for a small infection to become the starting point for a blind internal fistula or an abscess. Excision of larger pile tumors without suture subjects the patient to the danger of hemorrhage, exposes him to the possibility of chronic ulceration, and invites stricture.

Clamp and cautery.—This method was suggested by Cussack in 1846, adopted by Lee, of England, and popularized in this country by Kelsey, Tuttle, Gant, and Lynch. In principle it is based upon crushing the pile tumor, amputation of the portion above the blades of the instrument, and carbonization of the stump. The respective merits of this, and of the ligature operation, the only two which have survived years of trial, have given rise to endless controversy among proctologists, which resulted in an extensive use of the clamp and cautery in the decade between 1900 and 1910, and enabled surgeons to study its end results carefully. The consensus at the present day seems to favor its abandonment, because as a method it is unsafe and less free from complication than the ligature; it requires the development of a special technic and the use of expensive instruments, not always to be relied upon. It is regarded as unsafe because it is liable to be followed by primary hemorrhages from slipping of tissue at one or other extremity of the clamp or imperfect cauterization; secondary bleeding is apt to occur because of loosening of the clot from straining, vomiting, coughing or defecation. The presence or absence of pain following operation can certainly not be a matter of indifference to either doctor or patient; the cautery operation leaves the patient with burns of the mucous membrane and sometimes of the skin, which for the first few days are a trial to his endurance. Moreover burns in any situation are liable to produce excessive contraction, painful and tender scars, and in the anal canal narrowing and even stricture. Simplicity in the performance of any task is a point in its favor: wherever one is obliged to employ methods or instruments which are complex, there is greater liability to failure, then when simple methods, requiring fewer motions and less highly developed coordination come into play. Tying a knot is certainly simpler than the clumsy instruments one is obliged to use with the clamp and cautery operation. It is but fair to state, however, that while the latter is condemned at the present day, by an eminent authority in this country (7), the statistics compiled by Anderson, of the St. Mark's Hospital, of London, taken from a study of 300 cases, are favorable to the clamp and cautery.

Ligature method.—This depends upon the strangulation of the tumor by cutting off its blood supply, and sloughing of its pedicle by pressure necrosis. It has survived and displaced all operative methods, because it is logical in its conception, simple in its execution, and reliable in its results. One does not have to undergo long training or possess extraordinary skill to be able to tie a knot tightly, and if he will do that, the principal technical difficulty is overcome. We do not hear so much of postoperative bleeding following hemorrhoidectomy as we did formerly,

doubtless because of improvement in technic, but it seems to us principally on account of the employment of the ligature, which, if securely applied, largely eliminates this problem. Nor is this all; for it makes unnecessary the insertion of the rectal plug, which by obstructing the free passage of gas and damming back the wound secretions, gives the patient much needless pain following operation. The cutting out of the ligature leaves a small, clean granulating area, which under proper safeguards, ought to heal in the minimum of time. However, the best method is only as safe as the man behind it; one must be sure to use strong material for his ligature, preferably harness linen, No. 25 Barber's linen thread, or the strongest braided silk obtainable; tie the knot securely; transfix the pedicle when the tumors have a broad base; use a double thread, and tie each way.

Removal of the pile bearing area.—This was devised by Whitehead, of Manchester (8), in an effort to overcome objections to older methods in use for the cure of hemorrhoids. It is doubtful if in the whole range of surgery there is one operative procedure which is responsible for the suffering and misery which follow in the wake of this method; it is safe to say that fifty per cent. of all strictures, not due to lues, are the result of this operation. Hence it is but rarely practised in this country at the present day, though on the continent, and chiefly in Italy, it is still a recognized cure for the treatment of piles. Good authorities speak of it as being "but seldom indicated" (9) and one of its most ardent supporters (10) admits, that "if infection follows the Whitehead operation, it is almost certain to result in stricture." All men with experience in rectal work know how difficult it is to obtain primary union in surgery of these parts, hence this statement, coming from such a source acquires grave significance. The method depends, broadly speaking, on the separation of the tissues at the mucocutaneous junction by a circular incision, dissection of the mucous membrane of the anal canal with its bloodvessels, amputation of the portion containing the piles, and suture of the lower part of the rectum to the skin. If infection takes place, the stitches become loosened or cut out, the mucous membrane retracts, and leaves an ugly granulating area which fills in with scar tissue, contracts, and closes up the lower end of the rectum. To sum up, then, it is a bloody operative method performed on patients who can ill afford to lose more blood, technically difficult to carry out, even by men who possess more than average skill, fraught with dangerous complications and sequelæ, and all for what? To accomplish something which may be done just as well, in less time, and by means which are perfectly simple and easy to carry out.

GENERAL COMPLICATIONS.

The above complications are such as have some connection, direct or indirect, with the method selected: there are others which are common to all methods. They are mostly the result of infection, localized or general, reflex from disturbances of innervation, or traceable to direct mechanical injury to bloodvessels, muscles, or nerves.

Infection.—Fissure, fistula, chronic ulceration, abscess, phlebitis, and ascending infections of the portal system are all part of an infective process,

and arise from faulty technic, insufficient drainage, improper or neglected aftertreatment, or poor resistance of the patient's tissues from excessive loss of blood, vicious habits, or constitutional states. Given a patient in average condition, the writer's experience is that ordinary cleanliness, combined with proper drainage, will prevent infection from most wounds about the rectum.

Excessive postoperative pain arises from irritation of the peripheral nerve endings or from increased tension on the anal integument from swelling, edema, and traumatism incident to the operation. Reaction to pain is individual, and depends in rectal cases of the character of the lesion, its location, the racial peculiarities of the patient, etc., but not on the size of the wound. A small fissure may be more painful than an extensive dissection following a fistula operation; a carcinoma of the rectum located in the upper rectal chamber may give rise to but few subjective sensations, at least until it begins to cause pressure on neighboring organs or give signs of obstruction. Postoperative pain is generally less frequent after operation performed under local anesthesia, especially when quinine urea has been the agent used, because the parts remain numb for quite some time.

Secondary hemorrhage is a rather rare complication, and has been seen by us but once during the past year; it is usually easily controllable, except in persons with the hemorrhagic diathesis, because in doing hemorrhoidectomy according to the accepted methods no large bloodvessels are severed and the bleeding area is accessible.

Disturbances of bladder function are more common when the operation calls for dilatation of the sphincter because of increased trauma to the nerves which supply both rectum and bladder, more common after general than local anesthesia, and more common in men than in women in whom rectum and bladder are not in immediate contact. They consist mostly in temporary retention, difficult, painful, or frequent micturition, occurring within the first twenty-four or forty-eight hours after operation. Retention is best handled by permitting the patient to assume the upright position, the others according to general principles.

Spasm of the levator ani is an extremely annoying condition, and has been met by us in two instances during the past year. It appears to be due to explosive discharge of nerve force, in response to some irritation from the muscle or its nerves, and consists of painful, spasmodic contractions, coming on more or less regularly every five or ten minutes, with an intensity which is distressing. The patient is seized with a sudden, sharp, convulsive, cramplike pain in the rectum, which lasts a few seconds, subsides, only to recur with definite periodicity over an interval of one or more days following operation. In one of our patients who suffered severely despite repeated injections of morphine, an examination disclosed several thick strands of harness linen which had been used as ligature material and left long; his pain subsided quickly when these were removed. Another patient, similarly afflicted, was relieved when particles of apple skins and seeds were removed from the anal crypts, where they had lodged, tightly plugging them.

Gas pains.—A certain number of patients complain of abdominal pain following hemorrhoidectomy, ranging from mild discomfort to decidedly painful distention of the abdomen. This may be caused by swelling of the parts, which interferes with the free expulsion of gas and secretions, or reflex disturbances of the sympathetic system from irritation of nerve filaments which have been injured. In so far as it is due to the former, suitable preparation of the intestinal tract, avoidance of unnecessary traumatism, especially the introduction of the rectal plug, should prevent these. We have not found it necessary to administer morphine after operation for piles, except one dose of 0.25 grain before the anesthetic is given, in order to quiet the patient, lessen his excitement, and diminish postoperative vomiting.

Incontinence has been discussed under divulsion.

Stricture following hemorrhoidal operations is not as common as when the Whitehead operation was more widely practised, but it is still far from being rare. Excessive contraction of the anal canal is followed by the removal of too much skin or mucous membrane, especially when we leave large ulcerating areas. When there are a number of piles to be taken off it is the rule to permit islands of mucous membrane to remain between adjoining parts, denuded of epithelium; as an additional precaution it should be a routine measure to introduce a well oiled finger or bougie twice weekly into the anal canal to prevent the tendency to excessive contraction.

Prolapse of the mucous membrane.—A certain amount of mobility of the lining of the bowel is physiological, and assists in the expulsion of its contents, as may be easily demonstrated in the lower animals, especially the horse. In man, on account of the effect of gravity due to the upright position, straining at stool, particularly in the presence of piles, or changes in the intraabdominal pressure from various causes, this tendency is liable to become exaggerated, especially when there is loss of support from relaxation of the sphincters. It is desirable to remove this redundant tissue when operating for hemorrhoids in order to prevent this complication.

It appears from what has been written, that there are a variety of methods employed in the radical treatment of hemorrhoids; that only two of them have been shown, in the light of past experience, to possess any real merit; that complications are not infrequent, some more common with one method, some with another; that they run in degree from mild annoyances lasting a day or two to grave disabling affections, severe in character and permanent in effect; that to avoid them, so far as one may, one must select a proper operative method, carry it out with skill and judgment, and follow it up by careful postoperative measures.

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17 EAST THIRTY-EIGHTH STREET.

MASTOIDITIS.*

Prognosis and Treatment.

BY GEORGE E. STEEL, M. D., F. A. C. S.,
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In treating the subject of mastoiditis, I wish to approach it from the standpoint of the patient and the general practitioner. The question uppermost in the mind of the patient with mastoiditis, as well as in that of his medical adviser who brings him to the otologist for consultation, is that of prognosis. Aside from the relief of immediate suffering, he wants to know if an operation is imperative and whether it can be avoided; and, if an operation is necessary, whether his life will be thereby endangered, whether his hearing will be restored, how much, if any, deformity will result, how long it will take the wound to heal, and how long he will be compelled to remain away from business. It is my intention to discuss the subject entirely from this point of view. I shall cover the field very briefly, omitting many of the finer points of diagnosis and treatment, giving at the same time a rough estimate of the value of some of the laboratory aids which often afford positive or negative help in determining the prognosis, and suggesting lines of treatment which may influence the outcome favorably. I think most of us are taking a more conservative stand than formerly in the matter of operation, and this position has been assumed as a consequence in no small degree of closer study of the various factors concerned, mainly through a deeper appreciation of the significance of laboratory findings.

Given a case of acute mastoiditis, we may anticipate one of the following terminations: 1. The case may go on to spontaneous recovery with little or no treatment and function will be restored to normal. This is most likely to occur in children in whom natural drainage is better than in adults. 2. It may recover as far as mastoid symptoms are concerned, but the ear will continue to discharge steadily or intermittently, the perforation in the drum membrane remain open, and function be progressively impaired. 3. The patient may ultimately recover spontaneously after an unduly prolonged period of aural discharge, the perforation in the membrana tympani healing; but deposits, bands, or adhesions may remain which impair function, give rise to a distressing tinnitus and finally result in marked deafness. 4. Complications may develop, with or without operation, which may result fatally or jeopardize life. 5. The patient may undergo mastoidectomy and recover with or without impairment of hearing. It will be readily seen that the otologist must have all these possibilities in mind and a decision may demand close observation and a skillful interpretation of signs and symptoms, as well as the utilization of every laboratory aid in order to insure the best interests of the patient.

The blood count, upon which we used to lay so much stress, is not now considered of great value by itself, but may be an excellent indication of the resistance of the patient or of the onset of complications. It gives little information as to the

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progress of the mastoid inflammation itself. In uncomplicated mastoiditis there is apt to be a moderate leucocytosis, 12,000 to 18,000 white cells, with a differential count showing sixty to eighty per cent. polymorphs. A high polymorph count contraindicates a severe infection, but there are numerous exceptions to this rule. The blood count and culture are more important in the differential diagnosis between a suspected case of sinus thrombosis and other diseases, such as typhoid, malaria, or pneumonia. It is most advisable to have a Wassermann test in adults where there is any suspicion of lues. I know of a case of pronounced mastoiditis, treated by a confrère, which was cured by salvarsan. Malaria also should not be forgotten. Dr. James Dwyer, the pathologist of the Manhattan Eye, Ear and Throat Hospital, tells me that, from his experience in the examination of blood in cases of mastoiditis, a gradual increase in the mononuclear leucocytes from the normal of 0.5 to one per cent. to four or six per cent. is always sufficient evidence to warrant a mastoidectomy.

The examination of the pus is most important, for it is frequently an aid in prognosis. In an article by Dr. G. S. Dixon, of the New York Eye and Ear Infirmary, it is stated that "the relative virulence of these various microorganisms leads us to regard *Streptococcus mucosus capsulatus* as standing first, *Streptococcus pyogenes* next, *pneumococcus* third, and *staphylococcus* fourth, in acute suppurative processes about the middle ear. A case of acute purulent middle ear disease in which the infecting germ is *Streptococcus mucosus capsulatus* will tend to recovery equally with other forms of serious infection, provided it is seen early and proper drainage established. It is not these cases particularly to which reference is made, though such should immediately put the surgeon on his guard. It is those cases which are neglected, or cases in which the acute symptoms have subsided but the otorrhea persists and the *Streptococcus mucosus* is present, to which attention is directed." It is in these cases of *capsulatus* infection that one is likely to have greater destruction of the bony tissues, and more apt to have serious trouble should the sinus be accidentally opened. The pus as it is found in the external canal usually shows a mixed infection, but the predominant organism in the aural discharge is likely to be the one found in the mastoid pus and therefore may be assumed to be the specific organism. The earlier the smear is taken the more likely is it to show the predominant organism. In taking a smear, the canal should be cleansed and disinfected and the specimen taken from the first drop of discharge as it issues from the perforation in the *membrana tympani*.

The *staphylococcus* is the mildest of the several infections and most likely to recover under free drainage. It is, however, likely to set up *furunculosis* in the external canal, and when this occurs, especially if the case has not been followed from the beginning, it may make diagnosis difficult. Vaccines are decidedly helpful in these cases. *Streptococcus pyogenes* infection is apt to be violent, to be attended by a great deal of pain, and to progress rapidly. It is very prone to cause sinus involve-

ment. A good proportion of patients, however, recover without operation. One good feature of this organism is that the patient, because of his suffering, is not deceived into waiting too long and operation is undertaken more promptly. *Streptococcus capsulatus*, probably gives us more cases of meningitis than all the others combined. It is chiefly notable for its insidiousness, and its liability to set up a recurrent attack, even after thorough operation has been done, weeks or months after the original attack when recovery is apparently almost complete. It may manifest itself by an acute onset with considerable pain which subsides gradually, thus lulling both patient and doctor to the belief that the condition is improving; then another acute attack of pain, subsiding after a discharge of pus, and so on. The discharge never entirely clears up, and a pointing of the mucous membrane often projects through the perforation and thus obstructs drainage. Indeed, it is not unlikely that this tendency to cause extraordinary swelling of the mucous membrane lining the middle ear and *aditus* largely accounts for the irregular course of this infection, rather than any inherent malignancy of the organism itself. Drainage is obstructed almost from the first, and it will be noted that in many cases reported as recovering without operation, repeated paracentesis was done. A considerable number of cases of *streptococcus* infection clear up if the middle ear is drained early and kept dry, but it is doubtful if, once the mastoid cells are definitely attacked, recovery ever takes place without operation. This should be done early, thorough exenteration performed, the *tegmen antri* and *tegmen tympani* inspected, the cells around *aditus* curetted out and the wound left wide open and allowed to heal from the bottom. In this way we can materially influence the prognosis and guard against meningitis. The bacillus of gripe has been isolated by some bacteriologists from aural discharges, but has not been isolated by the bacteriologists of the institution with which I am connected. The *pneumococcus* is a very serious infection, being also of the encapsulated type, and what has been said of *Streptococcus capsulatus* is in a measure true of the *pneumococcus*, except that it is a little less virulent. It may be added, however, that where one finds the *pneumococcus* in the aural discharge, one should not be surprised to have a pneumonia develop before the healing of the ear takes place.

While x ray findings, as well as laboratory examinations are usually reliable, I would caution against depending on them absolutely. Even if the findings in the x ray plate are indefinite except as showing the location of the lateral sinus, this is a help, and in itself well worth the plate. I think it was Doctor Wood who emphasized the danger of placing too much reliance on laboratory reports. I consider it an excellent plan for the bacteriologist and surgeon to consult together, and a particularly good plan for the radiologist and surgeon to consult together over a doubtful case, and by comparing the appearance in the plates with the clinical findings, decide on what measures shall be taken.

There are many cases of *furunculosis*, in which it is impossible to examine the *membrana tympani*,

with symptoms which lead one to suspect mastoiditis; in most of these the x ray will clear up the diagnosis, but there are a few cases where, with the postauricular inflammation, there is considerable edema, and this edema will simulate mastoid involvement in the x ray plates. It is almost impossible in some of these cases to differentiate between furunculosis and mastoiditis. Here we are largely dependent on the experience and judgment of the radiologist who is familiar with these cases to assist in making the diagnosis. If the patient is doing well subjectively and objectively and the x ray shows small antral cells and large cells in the body of the mastoid process and all these cells are opaque, it would be well to advise operation on account of drainage, the smaller cells blocking up drainage from the larger cells. It is in this class of cases that perisinus abscess frequently develops. A persistent aural discharge lasting three or four weeks after operation calls for the x ray to locate any cells which were not removed. Those not removed are usually over the knee of the sinus and in the zygomatic region. The x ray is also useful in cases where there is a persistent discharge from the middle ear following a paracentesis to show whether the trouble is located in the middle ear or in the mastoid cells. It will also indicate progress toward recovery or the reverse in cases of mastoiditis. In old recurrent cases of acute otitis the writer would strongly urge the aid of the x ray to help determine the amount of involvement, if any, of the mastoid process.

The prognosis in a mastoidectomy done where there are no cranial complications and in a patient otherwise healthy is exceedingly good. In a mastoidectomy done at the right time before destructive changes occur in the middle ear, the hearing will return to what it was before the operation. If too long delayed, the ossicles may be attacked. In violent cases the incus sometimes separates and leaves the ossicular chain incomplete. The drum membrane may become thickened, or adhesive bands form, materially decreasing function and frequently producing a distressing tinnitus.

Assuming that we have a case of frank mastoiditis, the treatment is to insure free drainage through the membrana tympani. Frequent douching of the canal and an ice bag applied locally are indicated. Forty-eight hours is long enough to use the ice bag, which should be intermittently applied. I have had little personal experience in the use of vaccines in cases of acute mastoiditis, but reports from different observers give good results in some cases, in aborting or modifying the attack. I think it would be wise as a matter of routine treatment to administer a vaccine in cases which are not urgent, and where drainage has been instituted or is taking place, spontaneously. Doctor McKernon, in a paper on vaccines in cases of mastoiditis following the infectious diseases, reports excellent results from autogenous vaccines in hastening the healing of the wound.

The length of time it takes for a mastoid wound to heal necessarily depends on the size of the wound, including the amount of bone removed. In my experience in the clinic of Doctor Rae the average time for healing is about six weeks. To pre-

vent bad scarring, particular care should be taken in the dressings to see that one edge of the wound does not turn in. This can easily be avoided by careful packing. I have had no experience in the healing of wounds by the so called blood clot method, and I am under the impression that the consensus among otologists is not favorable to it. Great care should be taken to get the middle ear dry as soon as possible. Wick drainage and frequent dressings may be necessary to accomplish this, but very often the canal will be found dry in forty-eight hours after operation. Ideal cosmetic results while always our aim, should not be attempted at the risk of the patient's safety or at the risk of a second operation. In cases of infection from *Streptococcus capsulatus* the wound should not be sewn too tightly. If the discharge from the middle ear is persistent it is a good plan to open the wound and inspect the granulations. In an uncomplicated mastoiditis the patient should remain in the house for ten days after operation and from business for at least two weeks.

In conclusion I wish to urge that the best interests of the patient are served by making an early and reasonably definite prognosis; that the laboratory is of very material assistance if we correctly interpret the findings; and that by obtaining the comprehensive grasp of each case thus afforded we can on the one hand avoid many operations and on the other escape the pitfalls which surround a too prolonged expectant plan of treatment.

256 WEST SEVENTY-NINTH STREET.

THE ROLE OF MINOR SURGICAL PROCEDURES IN THE DEVELOPMENT OF THROMBOANGITIS OBLITERANS.

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At present the etiology of thromboangiitis obliterans is still in the stage of investigation. Numerous theories have been advanced to explain this puzzling disease, but none of them has so far come near its solution. It is not my object now to discuss the different theories, but I wish to call the attention of the practitioners of medicine and surgery to the dangers to which they often expose patients by the injudicious use of the knife in treating minor complaints of the foot, as an ingrown toenail, distorted nails, hammer toes, bunions, corns, callosities, varicosities, swellings, and abscesses of the foot or toes. The circulation in the toes is naturally poorer than that of any other region of the body. This is because of their pendant and distant position and of the immobility of the toes as they are encased in the often too tightly fitting shoes. This in itself is responsible for the greater difficulty of healing wounds, both accidental and surgical, of the toes even in normal individuals. The poorer the circulation, the more slowly reparative processes go on and the greater the chances for all types of infection to set in.

Whatever the underlying cause of thromboangiitis obliterans may be, it is evident that the immediate cause of the distressing symptoms is insufficient nutrition produced by the poor circulation in

the extremities, or by the complete cessation of the blood flow to the most distant parts of the extremity. The disease itself is very insidious in its development and its victims suffer from the effects of a weak circulation for a long time before the frank development of the disease. Thus most of the patients give a history of having suffered for years with coldness of the feet, excessive paleness, various pains and cramps—intermittent claudication—occasional swelling of the feet, poor healing properties of the tissues, deficient growth of nails, etc., all being evidences of a weak circulation. Many patients complain of only these vague symptoms even after there is a complete obstruction in the palpable vessels of the feet as evidenced by the absence of pulsations in the dorsal or plantar arteries of the foot. The reason gangrene has not set in yet is that, in spite of the obliteration of the main channels of circulation, there is sufficient collateral circulation to keep up the nutrition of the limb. When, however, trauma to the tissues and the smaller, perhaps newly formed, bloodvessels is produced by the hands or instruments of the surgeon, the circulation is so much disturbed that the resulting wound refuses to heal, an ulcer is produced which is exquisitely painful, or an infection sets in slowly with the exposure of nerve terminals, excruciating pain, and all the symptoms of the dreadful disease clinically known as thromboangiitis obliterans.

In going over the histories of these patients one is impressed by the frequency with which the patients attribute the development of this disease to a minor surgical operation and also by an almost constant failure of diagnosis of this disease by the majority of practitioners. The following histories are such as we obtain in about twenty-five per cent. of the cases and are illustrative of the harm done to patients by surgical interference in complaints of the lower extremities without careful examination of the patient, noting the circulatory condition of the lower limbs:

CASE I.—J. S., thirty-seven years of age; Russian Hebrew; tailor. Family history was negative. The patient had had smallpox and typhoid in childhood. He was a heavy cigarette smoker. About eighteen months ago he began to be troubled with coldness and slight pain in the right leg and foot, but was not greatly inconvenienced till about four months ago, when the little toe became red and a little swollen. A doctor, thinking that there was infection, cut into the toe. A wound resulted which refused to heal and became exquisitely painful, the patient then being in agony day and night. The ulcer showed no tendency to heal; the adjacent toe was also red and somewhat swollen; pulsations in the dorsal and plantar arteries were not palpable.

CASE II.—S. S.; age twenty-four years; Russian Hebrew; salesman. Past and family history was negative. Patient had weak feet ever since he could remember. For the past two years the toes felt colder than they should feel. A few months ago a fissure appeared near the nail of the second toe of the left foot. His doctor called it an ingrown toenail, cut the nail, with the result that infection set in and an ulcer remained which was extremely painful and showed no tendency to heal. The rest of the foot had a dusky red hue; the toes were angry looking. Pulsations in the foot were not perceptible.

CASE III.—J. W.; age forty-four years; Russian Hebrew; tailor. Family history was negative. He had typhoid when eighteen years old. He was a moderate cigarette smoker. Two years ago he began to experience pain in the sole of the left foot when walking, soon followed by cramplike sensations in the calf of the leg, compelling him to stop and rest at very frequent intervals. The toes gradually became red, particularly when in the pendant position.

After a while they improved very much until eight weeks ago, when he began to experience a burning sensation in the big toe of the right foot. The patient cut the nail very short, but the pain became worse, so he went to a dispensary, where the nail was removed. A large ulcer resulted, which refused to heal; the base was covered with a little grayish secretion; the toe was swollen and red, as was the rest of the fore part of the foot. The dorsal pulse was not perceptible. The plantar arteries pulsated. The toes were colder to the touch than those of the other foot.

Many more similar histories could be cited but these three are typical ones and they illustrate sufficiently the importance of going thoroughly into the history of the patient when he presents himself with what may seem to be a simple and trivial affection of the foot. A history of previous foot troubles should always put the physician on guard and suggest a thorough questioning and examination of the foot, noting especially their circulatory condition. In the history the following points are suggestive: pain in the feet and legs not relieved by any orthopedic measures; cramplike sensations in the calf of the leg when walking, forcing the patient to stop frequently; a tingling sensation in one or more of the toes; a burning sensation in the toes, one foot being colder to the touch than the other; a history of previous frostbite—these patients are very apt to suffer from it; and a history of migrating phlebitis. The last occurs in the form of small, red, elevated nodules, firm to touch and tender, situated over any portion of the foot or leg and occasionally on the upper extremities. They may come and go, disappear in one place and appear in another, or they may reappear on the same place, and they often precede the other symptoms by months or even years. The finding of one or more of these symptoms should lead one to suspect the presence of thromboangiitis obliterans, especially if the patient is of the Jewish race, born in Russia, and gives a history of excessive cigarette smoking. While the relationship of tobacco to the development of this disease has not been established, the fact remains that the majority of these patients are heavy cigarette smokers and, while it is highly improbable that tobacco is the direct cause of the arterial obliteration, it is very possible that the changes produced in the bloodvessels by the constant use of tobacco are predisposing to the development of the disease.

In the physical examination the following signs are indicative of the disease: a red or dusky red color of the toes or an excessively pale appearance of the foot; a rapid blanching of the foot when slightly elevated; an absence of pulsations in the dorsalis pedis or plantar arteries of the foot. Both the dorsal and plantar arteries should be palpated for pulsations and those of both feet compared. When the pulsations in one foot are not perceptible or are weaker than in the other, arterial obliteration should be suspected and when even all the other symptoms are absent, one should be highly conservative in the treatment of any complaint for which the patient may present himself. Even the finding of pulsations in the larger vessels of the foot does not exclude the presence of the disease, because the obliteration begins, as a rule, in the smaller vessels where the pulsations cannot be palpated, and many patients have well marked symptoms of the disease, such as pain, intermittent

claudication, coldness, red toes, and even extremely painful ulcerations on one or more toes, with palpable pulsations in the dorsal or plantar arteries. Once the disease is suspected any surgical interference is contraindicated because of the certain harm done to the circulation by the trauma to the tissues and bloodvessels, but instead, measures should be taken to improve the circulatory condition of the limb by the various means at our command as described elsewhere (1).

CONCLUSIONS.

1. The disease thromboangiitis obliterans is, as a rule, insidious in its development and many people suffer from it for years without development of gangrene or the extremely painful ulcerations characteristic of this disease.

2. The symptoms and signs of the disease are very often mistaken for some other minor surgical affection and surgical treatment is resorted to in order to relieve the patient.

3. The trauma to the tissues and the bloodvessels still more interferes with the nutrition of the parts, and ulcers are produced which are extremely painful and do not heal readily and often gangrene supervenes.

4. In any complaint of the foot one should always bear in mind the possibility of this disease and the physician should go thoroughly into the history of the patient and ascertain carefully the circulatory condition of the foot.

REFERENCE.

1. S. J. SINKOWITZ and I. GOTTlieb: Thromboangiitis obliterans, *Journal A. M. A.*, March 31, 1917.

1536 MINFORD PLACE.

CHLOROFORM POISONING.

An Unusual Case.

BY CHARLES E. HYDE, M. D.,
Bridgeport, Conn.

In my practice I have met several people who have the pernicious habit of using chloroform to make them sleep. The following is a case report of a patient who took two ounces of chloroform to make him sleep well and who was discovered just in time to save his life:

CASE.—H. S., male, thirty years of age, a private tutor, was found lying on his right arm, which was tucked under his side, in a deep coma. His breath gave off a marked odor of chloroform. Examination showed all the danger signs of deep anesthesia, with pupils widely dilated, and no reaction to light or accommodation. Respirations were of a deep, gasping character showing respiratory failure. Pulse was very weak, hardly perceptible. His condition demanded immediate stimulation. Strychnine, 1/30 grain, was given hypodermically at once. Gastric lavage, by passing tube through left nostril, obtained large quantity of dark green bile with a marked odor of chloroform. As his heart grew weak on three occasions, twenty minims strychnine and adrenalin by hypodermic were given when needed and his body was surrounded by heat. After one half hour electricity was applied to waken him. The most curious feature was the visible evidence of blebs filled with serum on the trunk and lower extremities. These varied in size, being larger on the feet; both plantar surfaces were in one large bleb. These blebs developed and were seen before water bags were applied, and when patient was first examined. The patient recovered his senses after seven hours. The musculospinal paralysis of the right arm from pressure gradually recovered after persistent treatment.

320 WEST AVENUE.

DISPOSAL OF SEWAGE.

BY HARRY GREENSTEIN, M. D.,
New York.

The physician of the future is to be not alone a student of matters taught to him in college and acquired through a limited hospital experience. He must of necessity be a student of hygiene and sanitation. Even more important than the health of an individual is the health of a community. The physician is the guardian of the public health. He owes a duty to the community in which he resides. His obligation is to find the cause and effect of disease. He must trace disease to its origin, and use all the known presumptive and confirmative tests for detection. In this way he will find a clue that ultimately is traced to the point of origin of the disease.

The human being is a biological machine and requires food for energy and growth. The substances ingested undergo metabolism and are split from complex to simple bodies. Some of these are retained and build up new tissue. Others are discharged as waste products, and are eliminated in the feces, urine, and perspiration. The urine represents the physiological wear and tear of the human body, the end products of cell metabolism. Perspiration is the secretory product of the skin. It consists of water, solids, and fats. The feces are the waste products eliminated at the anus. Its bulk depends upon the amount of food taken in by the stomach, and the absorption by the intestines. Its consistency depends upon the fluid content. The feces are composed of the products of digestion and indigestion, also foreign substances taken in by the stomach. It also includes gases, odors, worms, bacteria, protozoa, and eggs of insects taken in with the food. Of the numerous saprophytic organisms, the *Bacillus coli* outnumbers all others. It is classed as a normal resident of the intestines of man and animals. In disease the specific organism may be isolated. Man and animals harbor worms in their intestines, the worms lay eggs, the eggs develop into young worms, and are discharged with the feces upon the soil. Here warmth and moisture favor their growth. The human is superior to animals, and can be taught to deposit their excreta in places selected for that purpose. We know that man acts as a carrier of pathogenic organisms.

A person suffering a disease caused by a specific organism like typhoid discharges millions of germs in the urine and feces. They are highly poisonous, and if left uncovered and untreated will attract flies and domestic animals. The flies feed and breed upon these soft masses, some of which clings to their bodies, and they act as mechanical carriers of infection. Animals walk upon the mass and spread it about with their feet. Excreta must not be scattered broadcast. It must be discharged in private in places so constructed as to render the material inert and ineffective. The greatest difficulty is in lack of cooperation of the public with the health officer. The health officer must know the best method required in his section for its disposal.

Sewage consists of animal and vegetable matter undergoing decomposition. It holds feces, urine, bacteria, and minerals in suspension and solution. Its character depends upon its source, whether from

towns or cities. In appearance it resembles dirty water with floating material upon its surface, such as bits of wood, paper, matches, fruit skins, and vegetables. Sewage when placed in a tall glass or test tube for examination and allowed to remain quiet for twenty-four hours, will separate into a greasy and slimy mass. It later settles out or is suspended in a turbid liquid. This liquid gives off an offensive odor caused by putrefaction and fermentation. Finally the liquid becomes clearer, then the odor disappears, the sediment having been reduced and mineralized. Chemical changes of feces in sewage are the hydrolysis of albuminoids, decomposed by bacterial action, peptonization, and conversion into a soluble form. These are further split into aminoacids and their derivatives, leucin, tyrosin, indol, skatol, phenol, and aromatic acids. The aromatic acids are acetic, propionic, and butyric. During the chemical changes gases are liberated, nitrogen, hydrogen, hydrogen sulphide, marsh gas, and carbon dioxide. Besides all these we find ptomaines and coloring matter.

Bacterial changes in sewage are caused by the excretion of saprophytic and pathogenic organisms. The former are more numerous, grow vigorously, and destroy each other by consuming material necessary for their growth. They die from lack of food and exhaustion. Some undergo peptonization and liquefy albuminoids.

Some secrete an acid, others an alkali; some cause putrefaction, others nitrification and liberate gases. Others are phosphorescent and emit light; some are chromogenic and give off pigments. The vast majority are destroyed by light, heat, and chemicals present in the sewage. The pathogenic bacteria are: the putrefactive bacillus of Bienstock; the *Bacillus aerogenes capsulatus* of Welch, an acid and gas producer; the streptococcus and staphylococcus, the latter producing pus and pigment. Of the saprophytic bacteria, the *Bacillus coli* outnumbers all others. The bacteria in the sewage in the presence of oxygen attack the carbonaceous matter. A part of the oxygen is absorbed, and forms carbon dioxide; other gases as hydrogen and nitrogen are set free. They unite to form ammonia, which in turn unites with the carbon dioxide and forms ammonium carbonate. This salt is soluble and goes into solution. The next step is the oxygenation of the free ammonia in nitrous acid and nitric acid, aided by nitrifying bacteria in the presence of oxygen. The nitric acid unites with a base as sodium and potassium. They form sodium nitrate and potassium nitrate, and appear in the effluent in small amounts. Sewage when loaded with decomposed animal and vegetable matter pollutes the running stream. It contaminates the water of the community below. They must of necessity filter all the water used for domestic purposes.

Various chemical and bacteriological tests have been devised to detect the presence of pollution and infection. All of these methods must be checked up, and be compared with the standard set by the American Public Health Association. Our chemical tests are to detect the presence of past and present pollution. The nitrites and nitrates are used as an index of chemical pollution. The former represents

existing pollution; the latter, that pollution is recent or past. In making reports we constantly refer to presumptive and confirmative tests. Bacteriological reports are made accordingly to the presence and number of *Bacillus coli* in each c. c. of tested fluid. Dilutions are made 1:10, 1:100, 1:1,000, 1:10,000, and 1:1,000,000, also in five c. c. and ten c. c. of fluid. Two or more tests at different places for several days must be made before submitting report. Too much reliance is placed upon the *Bacillus coli*; another organism always present must be considered, the *Bacillus aerogenes capsulatus* of Welch, a pathogene that responds to many tests.

Bacillus coli is found normally in the intestines of man and animals. It is an aerobe, has motility, but does not form spores. It is Gram negative. It is a small bacillus with rounded ends, sometimes coccoid shape, and grows in pairs or end to end. It has no capsule. It coagulates milk in one to four days from lactic and acetic acid. It produces gas. It forms indol from peptonization of albuminoids. It does not liquefy gelatin. It clouds broth and gives a sediment. It forms acid and gas in dextrose broth. It grows along the line of stab in dextrose agar broth. It forms a luxuriant growth upon potatoes. When streaked upon Conradi, lactose, litmus, or Endo's plates it produces red colonies from lactose fermentation. It agglutinates specific and typhoid serum. The organism is saprophytic in nature, and when injected subcutaneously into a guineapig it will produce an abscess at the point of inoculation.

Bacillus aerogenes capsulatus of Welch is found in the dust of the air, dirt of the streets, sparsely in virgin soil, also in the human intestines. It is constant in sewage. It is an anaerobe, nonmotile, forms spores, and is Gram positive. It is a large bacillus, with slightly rounded ends, grows in pairs, sometimes coccoid shape, and is enclosed in a capsule; it may have involution forms. It coagulates milk, causing derangement of the creamy layer, with a stormy fermentation and gives off an odor of butyric acid. It slowly liquefies gelatin. It has an unpleasant odor when growing upon broth. It forms acid and gas in dextrose bouillon, and ferments all sugars with butyric acid odor. It grows deep in dextrose agar stab with gas formation. It has a slight growth upon potato. It agglutinates specific serum in dilution of 1:200. It acts upon proteins, forms indol, hydrogen, carbon dioxide, and marsh gas. The organism is virulent in nature, and when injected subcutaneously into a guineapig, it forms gas in the tissues, and the animal dies in a few days.

Treatment of sewage.—Let us trace the different methods in vogue for the disposal of sewage from the primitive state to the present accepted method. Man in the earlier days discharged his urine and feces at the most available place with little regard to location or proximity of water supply. If specific organisms were present in the intestines they were spread broadcast. We now understand how pestilence arose and destroyed large numbers of the people from apparently spontaneous causes. The odor of the feces attracted animals and insects. The

odor and offensive sight led man to hide and cover the mass. He covered it with earth. Later a receptacle was used in the primitive house.

These containers held earth to receive the intestinal discharges. They were covered over or buried at convenience. From earth to wood, to porcelain, and galvanized zinc was a great improvement in utensils. Time rolled on, and man no longer wanted the stench in the house, and he built privies; then cesspools, that were emptied at intervals. This was disagreeable and a nuisance. It cost considerable to keep them in order. All of these methods depended upon the nitrogen cycle in the soil for its ultimate destruction. The nitrogen cycle takes place in the upper six feet of the undisturbed earth's surface. Here organized carbohydrates and nitrogenized matter from animal and vegetable origin break down from complex to simple forms. They undergo metabolism, with the formation of intermediary bodies, nitrites and nitrates, and aminoacids. These various new formed bodies are taken up by plant life. Gases are formed, some escape in the air, others unite with bases to form salts.

Outside privies must be constructed from seasoned wood or stone with solid floors. They must be vermin proof, and free from exposure to flies and domestic animals. Doors must be screened with strong wire netting. They must be spacious and ventilated. Discharges should be received in cesspools that can be treated with chemicals. Care must be taken that there is no connection with water supply for domestic uses. It should be examined and inspected at intervals, also when danger is suspected, or when infectious diseases are in the neighborhood.

An inside privy is a sanitary cabinet made of seasoned wood, square or oblong in shape. The tank is lined with galvanized zinc. It may be made with detachable seats, so that they can be fumigated or washed with chemicals. This minimizes the danger of infection from a recent occupant. Below at the base of the cabinet are openings for ventilation. From the back of the cabinet there is a pipe leading to the ceiling of the room and passing through an opening to the outer air. A sieve is placed within the pipe to prevent the blowing in of the dust and dirt, which in time clogs the tube. These tanks are filled with chemicals to a certain height for disintegration of the contents. At certain intervals the contents must be removed. This can be done by removing the entire tank or by pumping into another tank by an attached siphon. An improvement to this cabinet is a pipe at the base that leads to another cabinet buried in the ground some distance from the house; it is filled with sand and acts as a leaching cesspool.

In sewage disposal we must consider many factors: city or town, geographical location, population, residential or manufacturing centre; location of the plant, a public nuisance, the odor from receiving and carting material; the amount of land required; the presence of undesirable neighbors engaged in this work; cost and efficiency of apparatus, maintenance, and care required to keep it in order; the number of units, the arrangement of parts, that it can easily be examined; a system that works in

harmony when all parts are in action; employment of capable engineer and assistants. There must also be a frequent and complete chemical and bacteriological examination, so as to keep in touch with the actual work. This detects early signs of pollution and infection. An income may be derived from the sale of end products. In the disposition of sewage, whether by primitive methods, dilution, sedimentation, precipitation with chemicals, digestion, coagulation in tanks, filtration, intermittent or continuous, farming, irrigation, or incineration, constant care and attention are required to render it inert and ineffective.

Separate and combined systems.—In the separate system the pipes and conduits lead to a common pipe, from there to the place of disposal. This is inadequate and allows accumulation of waste material in places. It becomes foul and acts as a nuisance. A heavy storm taking up large masses in the stream to the sewer soon clogs the system and floods the openings.

In large cities the disposal of feces and sewage are combined. A series of pipes and conduits, built underground away from and below the gas, water, and electric systems, collect and carry all the waste material from the household, stores, stables, industrial plants, and public highways. These conduits are built upon a firm and solid foundation to prevent sinking in of the system. They are made of stone, clay, terra cotta, brick, or concrete, circular in form with smooth interior that no foreign products will cling to the sides and clog the tubes. In New York the fecal discharges are received in toilets or water closets that are erected within the building. They must be properly installed, ventilated, lighted, and maintained in accordance with the rules and regulations of the sanitary and building departments. A toilet must secure privacy. The plumbing is simple. It consists of a pipe of durable material, well jointed, leading to a flush tank above, with automatic arrangement, and kept filled with water from the house supply. Below it is connected with a porcelain basin with attached seat and cover. The basin contains a trap and is connected with a sewer and vent pipe. This basin is flushed by pulling a chain or pressing a button, that releases the water from the tank above and washes the basin. In factories a series of toilets should be in use, giving time for cleansing and disinfection. No toilet should be near where exposed food is. Chemicals and heat can be applied to basins to destroy pathogenic organisms.

In the combined system there are pipes and conduits leading from the different places already mentioned; they are connected with pipes that lead to a branch trunk. There are also intercepting sewer pipes, that are new or from an older system. They in turn unite with the district sewer and then go to the main trunk. The main trunk has many openings at the place of discharge of sewage.

Catch basins are erected to gather domestic and store waste. They are built at or near the corners of the street, and have outlets that are grated to prevent large masses from entering and clogging the openings. Sewers when clogged cause a return flow and flood the streets. The basins may be in-

tercepted by other pipes, or the sewage may flow directly to the main sewer. Success of the system depends upon the structure, population of locality, tightness of pipes, and consumption of water. All pipes are trapped to prevent foul air from entering the houses. Piping should be so arranged that the intersections can be reached from the outside. Outside openings are called manholes. Manholes are openings upon the surface, built so that they can be entered for inspection and repair. They should be at least eighty feet apart, and not more than two hundred feet apart. They may have one or two covers, an inner and outer one, fastened by screw arrangement. In the winter time the manholes can be opened, the streets cleared of snow while it is falling, and dumped into the nearest opening. This prevents the accumulation of snow piles, which later melt, form slush, and interfere with traffic. In the summer time, after the streets have been swept and dirt carted away, the streets can be flushed with water from the nearest pump; the excess water flows into an open manhole.

Sewage by dilution is an old method; it is only of use to towns and cities situated at or near the seacoast that have tidal waters and a swift current. Here we depend upon its rapid disappearance without becoming a nuisance or any permanent injury to the water. Pipes must be wide and sufficient in number. In shallow streams the water becomes cloudy, flows away slowly, and a stench arises from decomposition. This stench is increased in humid weather, and from flowing in of the tide. Dilution pure and simple cannot be depended upon for purification of streams. We cannot depend upon sedimentation of solids. Aeration and oxidation of organic and vegetable materials are required to produce harmless end products. The destruction of pathogenic organisms is necessary, either by antagonism or biological changes from organisms that depend upon this material for their existence. The biological cycle must be complete, aided by anaerobic bacteria. Sunlight and chemicals are minute factors in destruction. Sedimentation or gravity localizes the trouble at the bottom and concentrates the mass. In shallow streams, instead of purification a nuisance results.

Disposal by tanks is as follows: The sewage is strained by basins holding stationary or revolving screens. They are composed of oak frames bolted together and covered with metal or wire. The screens hold back large masses that will clog the openings of the tanks and make it unfit for use. The strained sewage is passed to a grit chamber and the solids fall as a sediment. The liquid is now partially separated and passes to a septic tank. Here the stream, diverted by baffle walls that deflect the flow, distributes it evenly across the width of the tank. It now passes through a slot in the septic tank and air and light are excluded. Here it undergoes digestion and mineralization with the aid of anaerobic bacteria. It may be allowed to remain for hours or days. In the meanwhile the sewage separates into a liquid and semisolid mass that floats or precipitates; this is called sludge. The liquid passes through a series of pipes, is then aerated and may be treated with chemicals for coagulation.

Sludge is greasy in character and of slimy consistency. It contains about ninety per cent. of water, floats by gravity and cannot be shoveled. It is putrescible, aerobic, and a nuisance. The amount depends upon sewage and preliminary treatment. It can be removed from the tanks by siphonage. It is carted away to ships and dumped into deep water at sea, a distance from the shore. It quickly settles to the bottom. It may be dumped upon waste lands to dry in the sun. The water evaporates and a crust is formed. It takes considerable time to dry and costs a great deal of money for transportation. It may be disposed of by lagooning, filling in land depressions where water gathers and decomposes. It may be used to fill in trenches, dried, and plowed, and used as a fertilizer. It may be placed in incineration plants where it is reduced and the end products used in commerce. Bacterial content depends upon the source of the sewage, its treatment, and efficiency of process.

The effluent of the tank may be disposed of by broad irrigation over many acres. They are called sewer farms. The substance is rich in organic matter and is absorbed by the earth and can be used for fertilization of market products. Part of the substance undergoes mineralization. The excess may be collected by drains and carried to a running stream. The use of this method is insanitary, because of the numerous bacteria in the sewage, the danger being increased by pathogenic organisms. The effluent may be disposed of by sand filtration, continuous or intermittent. The latter is superior to the former. It includes air necessary to overcome putrefaction. Fresh sewage contains free oxygen, free nitrogen, and nitrogen in the form of nitrites and nitrates in suspension. This method requires many units. The sand must be sifted. The efficiency depends upon the fineness of the sand, and the underlying drains of loosely connected clay pipes.

Another method of disposal is the trickling filter. It consists of a bed of broken stone or gravel upon which the fluid drops, and is drained to the flowing stream. The effluent from a digestive tank passes through a spraying apparatus that may be stationary or revolve. It acts as an aerator. It can be an ornament at the same time. The apparatus can be constructed on the outskirts of a town, or in a place set aside for that purpose.

Disposal by incineration.—Incineration plants are furnaces that can be heated to an extremely high temperature. The furnace is heated from below and at the sides to keep the bed red hot. It has partitions with openings at side and top to receive refuse material. All substances are quickly burned and digested. To the top of the furnace is attached a high smokestack for removal of smoke and gases generated during the process of reduction and incineration. Openings at convenient places permit examination and inspection of the apparatus while in action. One or many of these plants, artistic in design, can be built at the river edge or in different parts of the city. Within the smokestack, near the top, some arrangement can be placed to deodorize gas and smoke; this overcomes the unpleasant smell. The low-

or part of the building can be used for lecture halls, exhibit centres, also for a comfort station.

Incineration may be carried on in apartment houses and hotels. The garbage is collected in shutters that lead to a compartment in the furnace. Here it is heated and liquefied, and treated with chemicals that act as a deodorant. The effluent should be passed through charcoal and sand before it goes to the main sewer pipe. Garbage can be collected home in tanks, holding chemicals that destroy and liquefy the contents. Tanks can be emptied by siphon or attached pump. Garbage ovens can be built in all large household stoves.

Treatment of sewage prevents the contamination of waters into which it is discharged. These waters hold and support food for human consumption. If polluted and infected the water becomes dangerous for use. We know from experience that shell food acts as scavengers of sewage, that polluted and infected waters are filtered through their bodies. Fishes living around city sewers imbibe pathogenic organisms, discharged by germ carriers, and when eaten are likely to spread disease. All sea food before it is eaten should be put on ice to retard the action of bacteria. It should then be exposed to heat to destroy all organisms.

307 EAST FIFTY-SEVENTH STREET.

Abstracts and Reviews.

THE NEW PATHOLOGY OF SYPHILIS.*

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In a very recent study made by Symmers, the lecturer said, of the 4,880 autopsies done at Bellevue during the last ten years, 6.5 per cent., or a total of 314 cases, were shown to have anatomical lesions of syphilis. A similar study made at Ann Arbor, covering the last ten year period and including 750 autopsies, showed 300 cases of syphilis, or forty per cent. The enormous discrepancy shown by the two studies relative to the incidence of syphilis could probably be explained by the use of different criteria for the post mortem diagnosis of the disease. In Symmers's investigation the criteria had been those of gross anatomical lesions such as aortitis, aneurysm, testicular fibrosis, skin and bone lesions, gummas, etc. These were the common criteria employed for the past half century and the ones upon which practically all textbooks based their statements, even at the present time. As long ago as 1858 Virchow clearly separated syphilitic lesions into the irritative and the gummatous, but his work was overlooked and the gumma has remained the central characteristic lesion of syphilis.

With the discovery of the organism of syphilis it was to be expected that a change would be wrought in our concepts of the pathology of syphilis and that expectation had been more or less fulfilled. It was not very long before the older parasyphilis was swept away and its lesions were proved to be due

to the presence of living spirochetes. The anatomical criteria, however, still remained centered about the gumma until the present time. Shortly after the discovery of the organism the author had begun the examination of various human tissues to determine its presence in them. With the appearance of the Levaditi method of staining it had been possible to find the spirochetes in the hearts in all cases of congenital syphilis dying before or shortly after birth. It was the custom of the lecturer and his associates always to make thorough microscopical examinations of sections from all of the organs and tissues of the body in every autopsy case. In the course of this routine work it had been observed that in every case of *tabes* or of *paresis* the heart had shown areas of fibrosis and inflammatory infiltration and the testicles had shown similar lesions. With the use of Levaditi's staining method it had been possible to demonstrate the presence of typical spirochetes in a large proportion of such lesions, thus confirming the previous impression that these were truly syphilitic lesions, which impression had rested mainly on the invariable association of the lesions with *tabes* and *paresis*. It had been possible, up to the present time, to demonstrate spirochetes in some seventy-five cases out of the 300 upon which autopsies had been made and in which syphilis had been diagnosed post mortem.

Since spirochetes were extremely numerous in the tissues of newborn congenital syphilis, the syphilitic nature of the lesions of the several organs was susceptible of easy proof. These lesions had been studied most extensively and had been found to be essentially similar in all organs. They consisted of areas, which under the low power of the microscope appeared edematous, and when examined under greater magnifications showed varying degrees of infiltration with fibroblasts and plasma cells. Differential staining also showed the presence of considerable amounts of mucin. Each of these lesions was proved to be the site of a colonization of spirochetes, which in the congenital syphilis cases were present in enormous numbers. Lesions precisely similar to these were constantly found in the organs in cases of known acquired syphilis, but here it was not possible to demonstrate the presence of spirochetes in such a large proportion of specimens. Such demonstration had, however, been possible in a number sufficient to prove the specific nature of the lesions and to show that here, too, they represented colonizations of the organisms.

Such were the criteria which had been employed in the study of the post mortem material from the 750 cases and such lesions were found in every one of the 300 cases diagnosed as syphilitic. In both congenital and acquired syphilis these lesions were found in the heart muscle, the endocardium and pericardium, about the coronary vessels, in the aorta, in the testes, the adrenals, the pancreas, the liver, and in almost every other tissue examined. These lesions varied considerably in size, from the most minute collection of a few cells to those which were just visible to the naked eye. They also varied in the stage of their development from the early and active lesions just described to those in which complete fibrosis and healing had taken place.

*Summary of a lecture delivered before the Harvey Society at the Academy of Medicine, New York, December 8, 1917.

Spirochetes were found in the various stages of the healing process up to that just short of complete fibrosis, but the latter was never found to contain them. In every case lesions were found in all stages of development, and none was found in which there were no active lesions. These lesions were the common ones of syphilis, both congenital and acquired, and the gumma, which had previously been regarded as the common lesion, was shown to be the rare type. The marked tendency of the lesions to undergo fibrosis and healing with the deposition of firm scar tissue was a striking feature and suggested that the spirochetes were generally relatively avirulent.

While the lesions described were typical of syphilis at all stages and in all forms, their distribution differed somewhat according to the type of case. Thus in congenital syphilis of the heart the lesions were found widely distributed throughout all of the tissues of the entire organ and its covering and lining. In acquired cases, on the other hand, the left ventricular wall near the apex and along the septum were the parts specially involved, although lesions might be found in other locations. Contrary to the general view it was not infrequent to find evidence of extensive syphilitic invasion of the heart muscle while the coronaries remained free from lesions. In the aorta in congenital syphilis the intima was often primarily involved, but in acquired cases the lesions were primary about the vasa vasorum in the adventitia, extended into the media, and by obliteration of the vasa vasorum caused a secondary degeneration of the intima. The lesions in the testes in acquired cases were found almost exclusively about the seminiferous tubules, just within the basement membrane, and the finding of numerous spirochetes in that location certainly warranted the belief that the disease might be transmitted by the seminal fluid directly. The adrenal glands showed the lesions most commonly in the medulla and the inner zone of the cortex, and the lesions were present in practically all cases of syphilis. The pancreas was often involved and in twelve cases of diabetes syphilitic lesions were found in all. These were typical of those found elsewhere, spirochetes were often present, and fibrosis was marked. The lesions here were most marked in the tail and body and not infrequently involved the islands of Langerhans very extensively. It was a striking fact that the location and extent of the lesions was not different in those cases which showed no diabetes from that in the diabetics.

The great majority of these 300 syphilitic cases found at necropsy occurred in patients in whom syphilis had not been suspected during life. A large proportion of them had also given negative Wassermann reactions, yet they harbored active spirochetes in their organs. In many there had been no history suggestive of syphilis and there were no marks of old lesions suggestive of the disease. Clinically, the cases were those of heart disturbances, nephritis, diabetes, and various chronic disorders of more or less obscure etiology. The patients, too, represented the better elements of the middle class, being village storekeepers, farmers, and the like. These studies pointed to the conclusion that after a period of more or less activity syphilis tended to

become very mild and to pass into a latent state so that the victim became a carrier of the spirochetes without evidence of active disease. It seemed certain that during the latent period the lesions were continually developing and healing so that after many years symptoms referable to the loss of function of one or another important organ would become manifest. It seemed evident from the investigation that there was a very large number of these latent cases of syphilis in the community and that this disease accounted for a very large proportion of our cases of chronic organic disturbances of ill defined etiology. Women were even more tolerant of syphilis than men, but both seemed to resist the infection remarkably well, or it might be stated that the spirochete was an organism of relatively low virulence for the human race.

The studies raised a number of very interesting problems, among which was the question of the possibility of a cure of the disease ever being accomplished. It was a striking fact in this connection that no case had yet been found in which there were not active lesions with active parasites and it was the lecturer's belief that the disease was never cured, but merely passed more or less readily into the latent state in which it progressed slowly to the production of destructive lesions which would make their presence manifest ultimately in the form of one or another of the common degenerative diseases. Throughout, the lecture was profusely illustrated with lantern slides showing the typical lesions as they were found in the various organs of the body and demonstrating the presence of spirochetes in the lesions of both congenital and acquired syphilis.

Eye Ground Examination in Recent Cases of Fracture of the Skull.—J. A. Kearney (*Journal A. M. A.*, October 27, 1917) states that increased intracranial pressure from hemorrhage or edema is generally one of the most dangerous factors in cases of recent skull fracture. The x ray determination of the location and extent of the fracture is of far less importance than the determination of increased intracranial pressure. From observations made on 212 cases of fractured skull it can be stated that the eye ground reveal a general edema which blurs all the details of the fundus during the first twenty-four hours after the admission of the patient to the hospital. This edema may be slight or very marked. The venous twigs are usually dilated, if they are visible. If there is no increased intracranial pressure and the patient is kept in bed this edema subsides slowly, but before this it may show some increase, especially in the nasal halves of the fields. Such changes as the latter are usually indicative, however, of some rise in the intracranial pressure and their discovery is of importance for they are the first indications of such a rise that are obtainable. Reading of the pressure of the spinal fluid at this time generally shows it to be increased. In other cases the increased pressure may be indicated by a distinct papilledema, and the spinal fluid pressure is then always found to be elevated. In increased intracranial pressure, decompression or lumbar puncture will cause a diminution in the edema, in the eye grounds in twenty-four hours

Medicine and Surgery in the Army and Navy

TRENCH DISEASES.

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With the outbreak of the war the medical profession of Europe found itself better equipped than ever in the history of the world to take care of the health of the fighting men. Vaccines, antitoxins, and serums of all kinds were available; asepsis had been carried to a fine art; salvarsan and other modern remedies were in use, and surgery was at high tide. As soon, however, as the German invasion of France had been checked and both fighting lines had dug themselves in, military surgeons found themselves confronted with two types of cases, both due to the unparalleled conditions of modern warfare. One was shell shock, due apparently to the emotional strain of warfare on such tremendous scale upon the nervous system, and the other was the occurrence of a surprisingly large number of ailments caused by the peculiar conditions of trench warfare. It is with the latter of these only that we have to do in this article.

The great prevalence of trench diseases will be understood if it is appreciated that while in trench fighting infantry have found the ideal method of defense from a military standpoint, they have also found about as unhealthy an environment as could have been contrived by human ingenuity. Standing for hours between two narrow walls of earth, his feet in icy water, liquid mud, or decaying organic matter, lacking vigorous exercise, under an intense emotional strain, it is small wonder that the organism of the soldier gives way at some point. There are three main conditions attributed to trench life: a relapsing fever, a transient nephritis, and frostbite of the feet. Besides these there are other pathological conditions described by some observers as separate disease entities and by others as symptoms, complications, or sequelæ of one of the three mentioned above. These are trench enteritis, trench shin, trench diarrhea, trench rheumatism, trench back, and trench jaundice. We will deal first with the three chief diseases somewhat fully and then more briefly with the others.

TRENCH FEVER (P. U. O.¹).

Description.—This is a relapsing fever of sudden onset and unknown origin, occurring in men who have served in the trenches and ending in recovery. The best work on this disease has been done by McNee, Renshaw, and Brunt. According to them it occurs always either in men from the trench zone or members of the Royal Army Medical Corps, and never in members of ammunition columns, ordnance corps, headquarters troops, etc. Age and service apparently have no bearing on the distribution. An English writer, O'Connell, thinks that the cause may be atmospheric, and advises that the atmospheric pressure about the trenches be studied when pyrexias occur; he attributes the fever to the

heat, humidity, and stagnancy of the air. Dyke, who had 200 cases, calls it a "nervous" form of influenza. Hunt and Rankin give exposure as the predisposing cause. Ramsay says: "In the training camps of England we have a disease which for all practical purposes is indistinguishable from the 'trench fever' of the overseas troops. It occurs in men who have never been in the trenches, and who are not infected with lice." He suggests the name "short fever."

Etiology.—Many attempts have been made to discover some organism responsible for this fever. McNee, Renshaw, and Brunt examined 100 blood cultures, finding them all negative. Urine, feces, and blood films were all examined, with negative results. Their conclusions were: The disease is transmissible by whole blood, but not by serum. The virus is not a "filter passer." It must be obtained in the blood corpuscles themselves. The mode of infection is unknown. Flies and other parasites have been suspected. Basil Hughes says cases are most prevalent when trench conditions are worst and the disease was always increased when the flies increased. Hurst thinks the louse is guilty. Dyke absolves both lice and rats. Wright says the cause is unknown, but may be lice. Hort says that he is not sure the virus is not a filter passer, as the technic employed by investigators suggests that albuminous material might have clogged up the filter. The dilution employed, he says, is not an adequate method of preventing this: the albumin should be centrifuged out and replaced by saline. Hunt and Rankin, who reported thirty cases in 1915, were unable to find any organism.

On account of the resemblance of trench fever to a syphilitic infection, it has been suggested that the cause might be a spirochete. Some workers, indeed, have found a spirochete in the blood and Reimer has grown them by anaerobic culture. Recently Nankivell and Sundell have found spirochetes in the urine of twelve out of fifteen cases of trench fever examined. These spirochetes were actively motile, measured from eight to fifteen microns, and showed an average of five curves. They did not succeed in finding this organism in blood culture films. This has been confirmed by Patterson. In October, 1917, Pappenheimer, *et al.* reported an organism in the blood smears, cultures from the blood, sections of peritoneum and fascia and cultures from these tissues. Several weeks later, however, they reported that they were mistaken and that the bodies they described were not microorganisms, or causative of trench fever. Moreland McCrea had a Wassermann reaction done on his series of sixty-three cases and found the majority of cases positive, but not strongly so. In only four cases could he get a history of syphilis, but this is not surprising, as soldiers have an interest in denying that disease.

A somewhat startling discovery is the one announced lately by Doctor Dimond who found a small hemogregarine, somewhat resembling the *Hemogregarina gracilis* found in the lizard, in the venous

¹P. U. O., pyrexia of unknown origin, is the title often given to this disease by writers who hesitate to name it definitely yet.

blood of patients suffering from this disease. He found two types: macromerozoites, seven to thirteen microns long, usually free in the plasma; and micromerozoites, three to four microns usually encysted in the red cells, but sometimes free. As Doctor Low points out, however, such a discovery must be confirmed beyond question for these parasites have never been found in man before and, even if their presence can be established, it must be proved that they are the actual cause of the fever.

Symptomatology.—McNee, Renshaw, and Brunt describe two classes of cases, which they call Class A and Class B. Both classes have an incubation period of from six to twenty-two days. The onset is the same, so that they cannot be told apart for the first few days. The chief difference is that Class A has a brief, high fever which drops on the third day, rises at once, and falls again on from the sixth to the eighth day. Four days later there may be another relapse lasting a day or two. In Class B there are many relapses, more or less periodical in occurrence; Class A is more common than B. In cases of the Class A type there are frequently pains in the tibiae, there is no diarrhea, but sometimes constipation. McNee, Renshaw, and Brunt say the so called "trench shin" is simply a symptom of trench fever, but most writers speak of it as a separate entity and as such we will discuss it later. The initial fever runs from 103° to 104° F., the pulse is about 100, the tongue is coated, and there is great anorexia. In cases of the Class B type the patient feels quite well after the first rise and fall of temperature and may go back to his duties, but a few days later he becomes suddenly ill again, with the same symptom picture as at first. The fever lasts a day or two, then falls to normal; then follow other relapses, varying in number and frequency.

Nearly all of the other writers on this disease have followed very closely the symptomatology as given above. Hurst says the spleen is often palpable. Grieveason describes a characteristic appearance of the tongue, occurring typically on the first day. This, he says, can be found in eighty per cent. of the cases and is sometimes recognizable as long as three months afterward. It is characterized by a red margin, one eighth to one fourth inch, with a thick, bright yellow fur covering the rest; this fur during apyrexia may be dull and slightly brownish in appearance, especially in those of a bilious temperament. Basil Hughes says there are three kinds of cases: He combines the A and B types described above in his Class II. Class I he describes as having a prodromal period lasting about thirty-six hours during which the patient complains of malaise and slight sore throat. Then there is a fever of 103° F., rarely higher, headache, and anorexia, a feeling of having been "beaten all over," and always constipation; there is no recurrence. In Class II, besides the symptoms already enumerated, he mentions pain in the back of the eyes, with vertigo or fainting, pains in the thighs and lumbar region, a rapid irregular pulse, profuse sweating, with a clear moist tongue, and a relapse after eight or ten days. Class III, he describes as having a fever of 102° to 103° with acute diarrhea; the stools contain blood and mucus. There is no relapse and the disease is due to the trench rat.

Chandler, reporting eight cases, gives diarrhea, bronchitis, and herpes labialis as common symptoms. Hunt and Rankin say the onset is sudden in seventy per cent., gradual in thirty; headache, vertigo and malaise occur in the latter. They found pain in the lumbar region in ninety per cent.; in the legs in eighty-six per cent., while pain and stiffness in the neck were very rare. Abdominal pains, radiating from the back, were present in thirteen per cent., there was a vertigo in most cases, but fainting in only seven per cent. Vomiting was present in thirteen per cent., and was always associated with obstinate constipation. The latter symptom was present in twenty-four per cent. These writers speak of the lack of constitutional disturbances; only ten per cent. of their patients even looked ill. The pulse rate in their cases was disproportionately high. Wright says the pain is always muscular, and Davies and Weldon lay stress on the fact the pains miss the joints. These latter writers also say that there are no catarrhal symptoms, no dry or coated tongues, and no constitutional disturbances.

The blood picture is one of moderate leucocytosis and must not be confused with an atypical typhoid. Hurst says the blood is always sterile and the Widal always negative; no spirochetes or malarial plasmodia are found. Hunt and Rankin were impressed with the variation of the leucocyte count in their thirty cases, the range being from 4,700 to 22,000 with an average of 10,500. McNee, Renshaw, and Brunt say that polychromatophil red blood cells above the normal size were found frequently and there was a well marked punctate basophilia, the color index being 0.8.

Diagnosis.—The diagnosis is fairly easy from the above symptoms, and is often readily made from the temperature chart alone. Any pyrexia with tender shins is very suggestive (Hurst). Davies and Weldon warn against attempting to diagnose by any one symptom. In the differential diagnosis influenza is the disease with which trench fever is most likely to be confounded. The three cardinal points of difference, according to McNee, Renshaw, and Brunt, Hunt and Rankin, and Hurst, are the absence of catarrhal symptoms in trench fever, the lack of prostration, and the occurrence of periodic relapses; malaria may be suggested, but there are no plasmodia. McNee, Renshaw, and Brunt report also the absence of splenic enlargement, but Hurst says the spleen is often enlarged. Relapsing fever is hard to differentiate at times, but the spirochete will not be found. Typhoid fever may be thrown out by the negative blood, urine and feces, the negative Widal and the frequent occurrence of periodical relapses. Malta fever may be excluded by the negative agglutination test, and dengue by the absence of an eruption.

Pathology.—The pathology of trench fever is practically a closed book. As there have been no fatal cases there have been of course no opportunities to study the disease process in the tissues. Search for a causative agent has been so far in vain.

Prognosis.—The prognosis is good. Cases always recover, apparently with no sequelae, but one attack does not protect from others. The patients suffer

but little and there are practically no complications. One case of phlebitis and two cases of jaundice have been reported. The total course of the disease is from four to six weeks.

Treatment.—The treatment is first of all preventive. While it has not been definitely proved that the disease is conveyed by rats, lice, flies, or other vermin, some writers hold that eradication of these pests is always followed by disappearance of trench fever. Davies and Weldon claim that they have made experiments which prove beyond doubt that the disease is conveyed by blood corpuscles carried by lice. Cold, wet, and fatigue are generally considered predisposing factors and must be duly guarded against. At the onset place the patient in bed on a liquid diet. Chandler recommends milk diet. A purgative may be given to begin the treatment, Epsom or Rochelle salts in most cases, but castor oil if there is diarrhea. Chandler recommends an initial dose of Dover's powder. Sodium salicylate may be given in from ten to thirty grain doses three times a day. Aspirin will relieve the headache, but has no effect on the fever. Quinine sulphate is recommended in five to ten grain doses three times a day. Potassium iodide and arsenic have been tried, apparently with no result. Hurst recommends the subcutaneous injection of quinine bichloride for relapses.

The pains in the tibiae may be treated with the galvanic battery or the application of cold compresses of magnesium sulphate. Incision of the periosteum is not recommended. Coal tar products apparently have little effect on this pain and occasionally morphine will have to be used. Iles recommends ionization combined with faradism for the tibial pain. Moreland McCrea, on the theory that the disease is caused by a spirochete, has tried intravenous injection of galyl, followed in three days by intramuscular injections of gray oil. This treatment once a week for ten weeks has given good results, he claims. Basil Hughes recommends sodium salicylate for his mild cases, followed by a tonic. For his Class II cases (*vide supra*) he recommends first a brisk purge, then fifteen grains each of sodium salicylate and quinine with an ounce of brandy; the next evening ten grains of Dover's powder and ten grains of quinine; the next day five grains of quinine with ten grains of sodium salicylate; then a tonic pill three times a day for four or five days. For his severe (Class III) cases he recommends one ounce of castor oil, then one drachm of chlorodyne in one ounce of brandy, with fifteen grains of bismuth salicylate three times a day. If the diarrhea persists he adds twenty minims of paregoric to the bismuth.

(To be continued.)

Nervous Cretinism.—F. G. Crookshank (*Lancet*, October 20, 1917) contends that the mild cases resembling spastic diplegia and occurring in young children are often cases of what was described by McCarrison as nervous cretinism. In such cases there are often no definite evidences of dysthyroidism, but there is usually some family history of thyroid disease and the condition in the children responds promptly to the administration of thyroid gland.

MEDICAL NOTES FROM THE FRONT.

Wounds of the Penis.—Wounds of the Sciatic Nerve.—Treatment of Compound Infected Fractures by Temporary Metallic Protheses.—Hemophilia in the Ex-Czarevitch.

GENEVA, December 1, 1917.

Wounds of the penis in warfare are not common and those that have occurred do not prove fatal *per se*, but some of the complications are disastrous for the patient's morale. These complications may be immediate or late in occurrence. Leaving aside complete division of the penis, the wound may give rise to severe hemorrhage or simply to an oozing from the erectile tissue. The arterial hemorrhage is easily controlled by ligature while hemostasis of the cavernous tissue is obtained by a catgut suture including the fibrous envelope.

It would appear that the late complications offer themselves in the form of vicious cicatrization involving either the corpus spongiosum and the corpora cavernosa, or their envelopes, or all these structures together. There may be deformity of the glans penis or a nerve branch may be involved, the latter resulting in more or less important trophic disturbances. From some published cases it at once becomes evident that it is of utmost importance to correct these vicious cicatrices by operation. Many patients have difficulty in mobilizing the prepuce, it being completely adherent behind the glans, thus making coitus impossible. An interesting case of autoplasty of the penis was that of a soldier who entered one of the hospitals at Lyons with an almost completely healed wound of the penis, but cicatrization had taken place in such a way that the penis was adherent by its dorsal aspect to the skin of the abdomen, which itself was wounded by the projectile. An operation completely freed the penis and the result was very satisfactory as the genital functions could be carried out without trouble.

Secondary operations may be required for correcting certain complications, as, for example, priapism from a wound of the left corpus cavernosum. Although the operation, which consisted in incision of and depletion of the congested corpus cavernosum, resulted in improvement, there nevertheless remained a certain amount of priapism. All wounds of the corpora cavernosa do not of necessity produce priapism, which only occurs when the hemorrhage is rather free. Consequently, if the patient alluded to had been given the benefit of an early operation, tending to limit the hemorrhage by suture of the left corpus cavernosum it is more than probable that priapism would not have occurred; at least, this was the opinion of the attending surgeon. Operations on the corpora cavernosa need not be limited to simple incision, but practical excision may very well be done if indications require.

In cases of wounds of the penis, urinary fistulae, due to involvement of the urethra, require the same treatment as those resulting from urethral abscess, stricture, etc., and are well known. The question of restoring nerves injured in wounds of the penis is important and new, although, unfortunately, space will not permit me to go into this interesting subject. I would, however, insist upon the necessity of treating wounds of the penis at once whenever

possible. Although these wounds are anatomically slight they may, if left untreated, offer certain serious problems from the social viewpoint.

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Wounds of the sciatic nerve from projectiles are very common and, according to Poty's statistics, are quite as frequent as those of the radial nerve. It would appear that about thirty-three per cent. of cases of neuritis of the upper and lower limbs are the result of wounds of these nerves. The causal factor of wounds of the sciatic is usually a rifle bullet or mitrailleuse shot, more rarely shrapnel or bursting shell. The nerve may be touched in different parts, as at the level of its roots, in the gluteal or femoral regions, and in its bifurcating branches. In order of frequency the sciatic is injured in the thigh, buttock, and calf. Regardless of the location of the lesion, four types of injury to the sciatic nerve are to be considered, namely, division, perforation, lateral wounds, and simple constriction by fibrous cicatricial tissue.

From the clinical standpoint, neuritis of the sciatic is above all, a mixed neuritis. During the first few weeks following the injury neuritic pain is intense and when it subsides paralytic and trophic disturbances persist as sequelæ of the wounds. When radiography or a wound without an exit aperture leads one to suppose that the projectile or a portion of it has remained in or in the neighborhood of the nerve, surgical exploration is indicated. When electrical examination demonstrates no excitability it may be deduced that complete division has occurred and the maxim, "every divided nerve should be sutured," may be applied.

In cases where the lesion is in a region such as the gluteal or lumbar areas, which requires considerable mutilation to reach it, medical treatment is indicated. The same applies to a lateral wound of the nerve or simple constriction from fibrous tissue. In partial wounds of the sciatic spontaneous recovery occurs by more or less complete regeneration of its fibres. Medical treatment should be directed against pain by the use of galvanotherapy and the retraction of tendons, stiff joints, and muscular atrophy by massage. It should also be directed toward the attainment of spontaneous nerve regeneration which, in the more favorable cases, may reach a *restitutio ad integrum* of the functions of the limb. If medical treatment proves to be inadequate and if at the end of several months nerve regeneration has given no results, surgical exploration of the nerve is indicated, followed by any reparative method that may seem indicated. Such, briefly, is an outline of the treatment of wounds of the sciatic nerve after an experience of three years.

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I have been greatly interested in the treatment of compound infected fractures by temporary metallic prostheses as carried out by the Lyons school, particularly by Villard. Since his results are particularly satisfactory it may be of interest to discuss this interesting and very practical subject. From the results with which I am familiar I can unhesitatingly say that fixation of fractured bones and splinters with Lambotte's metal plates in the treatment of infected fractures from projectiles of war,

is of the utmost service in reduction and immobilization. It is harmless and decreases the infectious phenomena by reducing the irritation of the focus of fracture to a minimum at the change of dressings.

The indications for the use of bone plates are fractures of the femur and tibia with great displacement, as is usually the case; fractures which cannot be retained in place after reduction, particularly of the arm and forearm; fractures with great loss of substance or with many splinters, so frequent in warfare, and last, pseudarthroses with an infected focus still present. Fractures from projectiles are characterized by infection, cutaneous destruction and numerous fragments of bone. When these are treated by plaster casts or splints immobilization is difficult to obtain and frequent changes of dressings, on account of the usual suppuration, are very hard to carry out. Metallic grooved splints are notoriously insufficient as the limb cannot be immobilized in them. Continued extension is only applicable to certain fractures and it has the same disadvantages as splints.

Villard and Bocca believe that plaster casts applied directly over the limb, with windows cut over the wounds, are the best, because they are not removed at the change of dressings; they use them in the majority of fractures. These casts, however, are sometimes insufficient and then the use of metal bone plates is resorted to in order to obtain a more exact approximation of the fragments. In cases, of marked displacement with many bone splinters and loss of bone it is essential to obtain a direct action by the use of bone plates which permits the preservation of the greater number of these bone splinters, whether they are adherent or not, all of which play a part in the formation and ossification of the callus.

When bone plating is done, dressings need not be changed as frequently, the first being made between the fifteenth and twentieth day after the plate has been put on. In other cases it may be necessary to change the dressings at the end of the first week or even before, while in still others this has not been done until the thirtieth to the fortieth day following the plating. Since change of dressings is not required frequently the patient suffers less and each dressing is less painful because the bone surfaces are not displaced during the process. The usual temperature chart in compound fractures as ordinarily treated is of the "steeple" variety, each "steeple" corresponding to a change of dressing. This is due to the trauma inflicted upon the infected fracture focus, by the necessary movements required during the change of dressings. All this is avoided by bone plating. Unquestionably there have been some cases which, without bone plating, would have had to be amputated on account of persistent infection and the resulting bad general condition.

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It may perhaps be of interest to your readers to have a short bit of medical gossip relating to the family of the ex-Czar of Russia. The ex-Czarevitch, a small, puny boy, who is the subject of hemophilia, has twice nearly died from hemorrhage. It is a mystery whether or not the ex-Czar was aware that hemophilia existed in the

ascendants of Alice of Hesse, but the ex-Empress was perfectly well aware of the fact, as was also Prince Bismarck. In Russia it is believed that the Iron Chancellor for political reasons arranged the marriage of Alice of Hesse, whose system bore the seeds of this dire diathesis, with the heir to the throne of Russia.

As is known, this constitutional anomaly is transmitted only by the mother, while she herself does not suffer from any of its manifestations. Thus the son of Prince Henry of Prussia, brother of William II, whose wife, Princess Irene of Prussia, née Princess of Hesse, is sister of the ex-Empress of Russia, are hemophiliacs. This statement was recently made in private by Professor Dr. M., former associate of the celebrated Professor Luthje of Kiel, who attended the youngest son of Prince Henry for severe accidents of hemophilia occurring during a sojourn in that city. In the ex-Czarevitch there is distention of the knee joints with dislocation of the articular ligaments, resulting in difficulty in walking, which are manifest signs of intra-articular hemophilic hemorrhage. The above came to me first hand from a reliable source.

CHARLES GREENE CUMSTON.

MEDICAL NEWS FROM WASHINGTON.

Work of Two Representatives of the Navy Medical Department Abroad.—Doctor Barber and Doctor Stitt nominated for Rank of Rear Admiral.—Naval Training Laboratories Proving Valuable.—Comment on Resuscitation Apparatus.—Increase in Regular Army Calls for Increase in Medical Corps Personnel.—Army to Provide its Own Hospital Ships.—Orders Concerning Charges in the Case of a Soldier Refusing Medical or Surgical Treatment.—Pending Legislation on a Sanitary Reserve Corps.

WASHINGTON, January 8, 1918.

In connection with the systematic sanitary studies undertaken by the Navy Department Bureau of Medicine and Surgery, very valuable work has been done, often under circumstances of great difficulty, by its medical representatives sent abroad to collect information in regard to the conduct of the war. Among these observers is Surgeon Karl Ohnesorg, of the navy, who resided two years in Germany immediately before we entered the war and who brought back with him much valuable material in addition to that sent home by him while abroad. Medical Inspector F. L. Pleadwell, of the navy, was the naval representative of the joint army and navy contingent of four medical officers who visited Great Britain and France to study the advances made in medical organization and administration. Following his return to this country, he has been engaged in tabulating and coordinating the mass of information accumulated, with a view to having published such parts of it as are not of a confidential nature, pertaining to administration, transportation, sanitation, construction, methods of treatment, the venereal problem, alcoholism, cremation, disinfection, various devices for camp use, education of the disabled, artificial limbs, etc.

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Medical Inspectors George H. Barber and Edward R. Stitt, of the navy, have been nominated for advancement to the rank of rear admiral. Doctor

Barber is a specialist in tuberculosis, and for several years he has been at the head of the naval hospital at Las Animas, Colo. He has served many years at sea, and he has had service at training stations and hospitals both in the United States and in the Philippines. At one time he was in command of the hospital ship *Relief* on the Asiatic Station. His special work in connection with tuberculosis led to his selection for duty at the head of the hospital at Las Animas. During the five years he has been in charge of the hospital, it has been enlarged from a capacity of 200 beds to accommodations for 760 patients. Doctor Barber is a native of Massachusetts, a graduate of the College of Physicians and Surgeons, Columbia University, New York, and he entered the navy as an assistant surgeon in 1899.

Doctor Stitt, who is president of the Naval Medical School at Washington, is a specialist on bacteriology, pathology, and tropical medicine. He was medical officer of the Nicaraguan Canal Commission in 1895. Later, while on duty at the Navy Department in the Bureau of Medicine and Surgery, he took special courses in bacteriology at George Washington University at Washington. While cruising on the *Hartford* in the West Indies in 1899-1900, he continued his studies of tropical diseases. When the Naval Medical School was established at Washington in 1902, Doctor Stitt was chosen to establish and take charge of the laboratory, and since then he has been connected with the school, of which he now is president, except for a period of postgraduate study and two periods of duty in the Philippines, first as executive surgeon and later as commanding officer of the hospital at Canacao. In 1905 Doctor Stitt attended the London School of Tropical Medicine, from which he received a diploma "with distinction," being graduated second in a class of forty. While commanding the naval hospital at Canacao, he served as associate professor of medical zoology in the University of the Philippines. In 1908, he was appointed to the chair of tropical medicine of George Washington University and to a similar position in Georgetown University at Washington and in the Jefferson Medical College at Philadelphia. In 1911, he was naval representative of the advisory board of the hygienic laboratory of the Public Health Service. In 1912-1913 he served as president of the American Society of Tropical Medicine. He is a graduate of the University of South Carolina, and he received his degree of M. D. from the University of Pennsylvania. He entered the navy as an assistant surgeon in 1889.

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The latest reports received at the Navy Department by the Bureau of Medicine and Surgery indicate that the rates of sickness on board ship and at the training stations have been materially lowered as compared with the immediately preceding rates, and the hope is entertained that there will be escape from the epidemics that naturally would ensue incident to cold weather and from the crowded condition of barracks at the training stations. Special precautions continue to be taken to overcome such possibilities, and every facility known to the science of sanitation is being utilized for the protection of the service health.

The so called traveling laboratories, three in number, equipped to meet emergencies arising at places without such installation, have proved of great value. One of them recently was summoned to the marine corps camp at Quantico, Va., where the unit is destined to discard its mobile characteristics and become a permanent institution. The same is true of another unit, which has been sent to the naval station, New London, Conn., where the increase in personnel probably will serve to keep it there.

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Attention is called by the Bureau of Medicine and Surgery to the erroneous belief entertained by some medical officers of the navy, judging from letters received from those sources, that the various types of resuscitation apparatus have more power to save life than a good method of manual artificial respiration, with special reference to asphyxia by submersion and by poisonous gases. The conclusion communicated to the naval surgeons is that the Schaefer method of manual artificial respiration with the use of oxygen in suitable cases will save life where life can be saved; and that, where it fails, although properly performed, it may be assumed that no form of apparatus would have succeeded. Experimental work now is being conducted along lines indicated by the Bureau of Medicine and Surgery toward developing a simple oxygen inhaler, which will act either under ordinary atmospheric or excess pressure, with a view to furnishing a really useful and available means of administering oxygen in certain cases.

* * * * *

As a result of the increase of the authorized strength of the regular army to 380,000, there will be an increase in the number in each grade of the Medical Corps by thirteen colonels, twenty-one lieutenant colonels, and ninety-two majors, bringing the total authorized in each grade to seventy-nine colonels, 135 lieutenant colonels, 590 majors, and 1,696 captains and first lieutenants. There remain 1,702 vacancies in the commissioned personnel of the corps.

* * * * *

The army will have to provide its own hospital ships, as the navy is in no position to take care of the sick and wounded of the military establishment in transportation from France by sea. Correspondence recently was exchanged on the subject between the Surgeon General of the army and the Surgeon General of the navy, during which the former expressed the desire to have the Navy Department provide adequate means of bringing back to this country those of the army that were disabled. Of course, this could be done easily enough on the regular transports, if it were not necessary to install special facilities and provide doctors and nurses for the seriously sick and badly wounded, in which event there would be required more space for beds and for attention and treatment of patients than where men are convalescent.

The hospital ship being specially constructed at Philadelphia for the navy and the ships being converted into hospital ships—the *Comfort*, formerly the Ward liner *Havana*, and the *Mercy*, formerly the *Saratoga* of the same line—will barely be suffi-

cient to take care of the naval sick and wounded, with an occasional army case of special emergency. The naval medical officers, of course, are anxious to cooperate in every possible way with the army surgeons, and they will render whatever assistance they can in treating the sick and disabled of the military force, but unless special provision is made for a large number of hospital ships, with adequate medical and nursing personnel, it is out of the question for the navy to attend to this important detail. Thus the army will have to look after the overseas transportation of its own sick and wounded; and, if as many as 5,000 ultimately are to be transported home each month, it probably will be necessary to have some twenty or more hospital ships.

* * * * *

Following the recent case at Camp Shelby, Miss., of an enlisted man who refused to undergo a surgical operation and was sentenced to imprisonment for two months, and in which the War Department set aside the sentence because the surgeon did not certify that the operation would be without risk of life of the soldier and was necessary for removal of a disability that prevented full performance of military duties, orders have been issued prescribing what the surgeon has to certify in such cases. Hereafter, before charges are preferred against any soldier for refusal to submit to medical treatment or a surgical operation, there will be obtained by the officer preferring the charges a formal, signed certificate of the surgeon who has attended the soldier, stating the nature of the disability from which the soldier is suffering, whether such disability prevents the full performance of any and all military duties that properly can be required of him, stating the nature of the treatment or operation that is necessary to remove the disability, and stating whether the treatment or surgical operation, as the case may be, is without appreciable risk to his life.

* * * * *

Members of the Public Health Service are much interested in pending legislation for establishment of a Sanitary Reserve Corps. The necessity for such an organization of trained sanitarians and health officers, whose services could be utilized in the occurrence of epidemics or other emergencies of a public health character is one that has been felt on numerous occasions in the past. This need has been particularly urgent in the work recently undertaken for the sanitation of areas adjacent to military cantonments and industrial establishments—work of vital importance that suddenly confronted the Public Health Service with the entrance of the United States into the war.

As proposed by the pending bill, the personnel of the reserve would be enrolled, but it would receive compensation only when called upon to perform active duty. It is believed that through the establishment of a reserve organization such as is proposed an efficient force could be maintained for the protection of the public health under the supervision of the Federal Government, at an expense that would be comparatively small and thoroughly justified by such circumstances as would result in its call to active duty.

Editorial Notes and Comments

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A Weekly Review of Medicine

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THE CANADIAN MEDICAL PROTECTIVE ASSOCIATION.

At the annual meeting of the Canadian Medical Association in Winnipeg in 1901 an organization, which has proved itself of the utmost service to members of the medical profession, came into existence and was styled the Canadian Medical Protective Association. There had been in Canada a feeble attempt to establish a protective association in the eastern townships of the Province of Quebec, but it had not gained any particular headway even in its own province, and certainly not throughout the Dominion at large. It was only when the national medical body took the matter up that a strong organization was born which continued in active work up to the outbreak of the war. Something like one eighth, perhaps, of the medical profession in Canada became members of that association which has always had its headquarters in Ottawa, the capital.

In 1913 an Act of Incorporation was secured from the Canadian Parliament. The objects of the Association are set forth in that Act of Incorporation, namely, to support, maintain, and protect the honor, character, and interests of its members; to encourage honorable practice of the medical profession; to give advice and assistance to and defend and assist in the defence of members of the Association in cases where proceedings of any kind are unjustly brought or threatened against them; to promote and support all measures likely to improve the practice of medicine. While that Association attracted a considerable membership in the first years of its existence, war conditions have drawn many of its members overseas and as a consequence the paying membership ran down in 1915 to 831, in 1916 to 747, and in 1917 to 678. A strong effort is now being made by the officers and executive to bring a large new membership into its fold.

Not in any case does the Association pay any levy, should such be assessed against any member in a court of law, but it does undertake to defend any action for alleged malpractice and does pay the cost of it. Each year there has been a number of such cases to defend, but never, so far as can be learned, has a single case been lost which the Association has undertaken to defend. That is a record to be proud of, and it would seem very remarkable that the medical men of Canada do not back up an organization which is a strong preventive of suits not alone to its membership but to other practitioners as well. As an interesting example of the run of cases the following may be cited from the law reports of British Columbia: An action was brought against a member of the Association for alleged wrong diagnosis in a case of leprosy whereby the plaintiff was confined for a period by the authorities in a lazaretto. The Protective Association agreed to defend the action. In June last the officers at Ottawa were notified that the case had been settled by a verdict in court in favor of the Association for want of prosecution.

Another strong point to the credit of that Association lies in the fact that all the members gone overseas have been kept in membership in good standing and no annual dues collected from them at all. We should think that every member of the Canadian Medical Association, in fact every member of the profession in Canada, would early seek enrollment in the Protective Association which has such an enviable record to its credit and an organization which cannot fail to bring to each and every member a due measure of security.

THE PATHOLOGY AND PROGNOSIS OF GONORRHEAL MYELITIS.

That gonorrhea is a general disease is today an established fact. It may present complications in various systems and particularly in the nervous system, in the form of cerebrospinal meningitis, polyneuritis, and myelitis. Whether or not these morbid processes are due to the gonococcus or its toxin is still an open question, but the clinical evolution would seem to plead in favor of a direct gonococcal origin.

In gonorrheal myelitis there is an exaggerated vascularization of the meninges and simple inspection shows softening of certain portions of the cord or even in its entire extent. The cerebrospinal fluid is usually limpid and small in amount. The microscopic lesions are interesting to the highest degree, but have not been thoroughly studied. The white substance is greatly altered and the same changes involve the different columns. In one case the fundamental fasciculus and Burdach's column were the most affected. The axis cylinders are preserved, but the myelin is greatly altered and at certain spots it no longer exists. In other areas it is more or less deeply divided and when stained with osmic acid shows that the segments are separated from each other. The white matter is infiltrated by leucocytes and at certain spots offers a certain degree of connective tissue organization, characterized by the elaboration of fibrillæ stained red by Van Gieson.

Numerous granular bodies are also found but, generally speaking, the nerve cells themselves show few changes. However, in the anterior horns it will be found that some of them have lost their prolongations and present a certain degree of central chromatolysis. The canal of the ependyma is dilated and its epithelium has proliferated and offers buds which project into its cavity. The vessels do not present any morbid change, but they are dilated and engorged with blood.

The meninges are normal, without any leucocytic infiltration; this likewise applies to the spinal ganglia. As to the rhachidial roots, they show little, if any, change, and when there is any they only occupy that portion nearest to the cord and become less marked the nearer the spinal ganglia are approached. The most unstable morbid changes are to be found in the white matter and consist of a degeneration of the myelin.

The prognosis will vary as the morbid process is attenuated or assumes a serious form, but it must not be forgotten that the former has a very slow evolution, that it may become complicated by amyotrophy, and above all that it may

change to the more serious type of the affection, either from urinary infection or from septicæmia whose starting point is a sacral bed sore. Therefore, the prognosis is always serious, and for this reason should be guarded.

THE ENERGY CONCEPT IN PSYCHIC THERAPY.

"As if a wheel had been within a wheel," said an ancient Hebrew prophet of the vision that he saw. Wheels within the head is the modern vernacular expressively stating dire mental confusion and irresponsibility. Driving energy forces at odds with one another seeking to usurp the final common pathway for selfexpression is the explanation with which the clinical psychiatrist endeavors to read the cross purposes of the psychic life which makes the patient "nervous," restless, unhappy, ineffectual, and suffering a psychalgia as distressing as it is difficult for the patient to define and explain.

Some such concept of a constantly shifting energy, available now for this form of activity, now for that, is necessary for a sufficient explanation of this confusion and disorder, as well as for a working basis whereby there can be a restoration of order in a redirection of energy. Such a vital dynamic conception throws light and hope where old static definitions and descriptions of mental disturbance set barriers in the way of understanding and concealed the true nature of psychic disorders offering no means of thorough readjustment. Now physicians of psychic diseases are discovering in psychic activities, whether rightly or wrongly directed, evidence of the energy moving through all forms of life and only manifesting itself here through a different form of energy carrier, by which the striving to live is expressed on a different plane and in a special manner.

Wheels within wheels of a marvelous energy utilization and expression is the impression to be gained from the study of the beginning and slow yet sweeping development of life in terms of the "capture, storage, release, and reproduction of energy" as this is presented in *The Origin and Evolution of Life*, by Henry Fairfield Osborn. In this study, however, energy movement is viewed only from its physiochemical aspects. These lead a long way and the theme is a fruitful one, first, as it is pursued through the gradual gathering together of elements under favorable conditions of moisture, temperature, and then sunlight, to form the first living protoplasm and in the evolution of this to increasingly higher,

more complex forms. There is also a deeper following of the life process to discover the ways it has pursued, what this development of life has brought about and what is being wrought for individual and race.

It is fascinating and stimulating to follow with the author, somewhat in speculation, far more from the records written in geology and paleontology, supplemented by embryology and existing forms of plant and animal life, the shiftings and transformations of energy in the "actions, reactions, and interactions" which have made up the history of living forms and their relation to one another and to the varied environments in which life has been lived. Hormone or chemical messenger activity, with the more mechanical bodily activity, have not been neglected as energy carriers. Yet all the way along the form of carrier that has been most extensive and contains the greatest possibilities for energy potentiality is barely hinted at. In the face of the ignorance and obscurity which still enshroud this age long movement of energy and the mystery that still obscures the nature of life itself and its possible purpose, this higher, greater factor presses for recognition and consideration. Most of all it demands acknowledgment before these mental difficulties and here it claims service from this discussion of energy transposition and transmutation on these lower levels.

Close beside this and constituting a response to environment which contains all the source and structure of emotional life from the first sensitive result of action, reaction, and interaction to the highest affective life of man, energy found for itself through feeling and finally through ideas added to it, the avenues to reach by means of symbols new adjustments, wider forms of expression, new paths for creation.

This is the secret, if secret there be, of Freudian therapy. It finds the struggle of the higher life, the mental, psychic, in just such terms of "capture, storage, release, and reproduction" of energy as those manifest in the physicochemical and sensorimotor processes of life. In its wider scope it utilizes even these, so that thus the somatic life processes stand at the service of this higher distribution of energy. This throws light upon the endeavors and strivings in the psychic plane, its frustrations and failures, the effort for symbolic values of one kind or of one grade of psychic cultural value to supplant another. Then confusion, inefficiency, and distress, mental or psychic sickness, ensue. Thus also a way is opened through recognition of this energy and its work on this plane to recapture it for the higher, more

useful psychic adjustments and adaptations, and control and health once more result.

Wonderfully simple seems the unfolding of so profound and far reaching a history of life as that found in these pages, in the light of such an energy concept. Marvelous in simplicity and ability to touch the secret springs of success or health, and maladjustment or disease, is this same energy concept in the psychic realm, even in the face of the complexity and the depth of the mental life of man.

UNTOWARD SURGICAL COMPLICATIONS.

Although the risks from the direct effects of surgical operations, such as anesthesia, shock, etc., and from the complications following indirectly have been greatly reduced by the newer technics, there is nevertheless still left an element of untoward surgical danger which cannot be foreseen and which renders the prognosis of all surgical operations doubtful. Of these the most common, the most serious, and the least amenable to successful treatment are thrombophlebitis, parotitis, and paralytic ileus. Each of these conditions may follow comparatively simple surgical interference, although they are most commonly associated with abdominal operations. Thrombophlebitis may even occur after normal labor. When surgical operations must be undertaken to save life, the question of complications can be ignored, but when the needs are not urgent, the danger of these complications contribute to the conservatism in the performance of surgical operations. These untoward complications have a parallel in the sympathetic nonpurulent inflammations provoked in the sound eye after ocular operations. Here the reasons are understood to be the disintegration of the pigment epithelium of the uvea, which has a specific anaphylactic action upon homologous tissues. Although many theories have been advanced for the causation of these specific postoperative complications, it is not at all unlikely that there may be a similar anaphylactic action to that occurring in sympathetic ophthalmia.

In the thrombophlebitic conditions it would seem that infection would play the most important part, yet neither clinically nor experimentally has this been demonstrated. Neither endothelial damage nor slowing of the blood stream *per se* is the sole cause. Undoubtedly vessel wall changes, blood changes, anatomical peculiarities of certain regions, mechanical irritants or specific tissue irritants, and infective processes

all contribute their share to the etiology of these complications. Following operations upon the bloodvessels, but particularly upon the alimentary canal, about two per cent. of the cases operated give evidence of thrombophlebitic complications. About seventy per cent. of these are in the lungs. About ten per cent. of all the thrombophlebitic complications are fatal, according to Wilson, of St. Mary's Hospital, Rochester, Minn., and Coon, of Louisville, Kentucky.

Parotitis is a less frequent untoward surgical complication. In children it is rather common after a mastoid operation; otherwise, this complication is more nearly confined to adults. The condition is an infective process, not through the bloodstream, as is evidenced by the absence of inflammatory processes about the bloodvessels of the parotic lobules, but the infection is an ascending one through Stetson's duct. The duct in the centre of the lobule is usually found choked with debris and infective material. Pus is usually confined beneath the dense parotid fascia and evidence of fluctuation may not occur probably before the onset of grave pyemia. In a measure this complication is not as untoward as the others. If injury of the parotid is avoided during anesthesia and the mouth and teeth kept scrupulously clean, infection is less likely to occur.

Paralytic ileus or distention is the most serious complication of them all, and is often fatal. There is a paralysis of the muscular coats of the intestines accompanied by enormous distention. This condition seems to be caused by irritation of the splanchnic fibres which in turn inhibit the normal movement of the intestines. McKenna believes that paralytic ileus is a nervous condition caused either by disturbances in the anterior cornual cells and in the corresponding sympathetic ganglia giving origin to the splanchnic fibres, or to disturbances taking place directly in the sympathetic plexuses of Meisler, Auerbach, and Billroth within the walls of the intestine. Moreover, it is not unlikely that these disturbances take place only in individuals of unstable nervous constitutions and, particularly those who are prone to disturbances of the vegetative nervous system.

MAINTAINING HOSPITAL STAFFS.

One of the most pressing problems which confront hospital authorities is the maintenance of a sufficient staff of duly qualified interns. Under the selective service regulations provision is made for the voluntary enlistment in the enlisted Medical Reserve Corps of all interns who are subject to draft. Interns so enlisted are to be subject to such regulations as the Surgeon General may prescribe.

A strict enforcement of the regulations so far provided would rob the hospitals of all advanced interns and resident physicians of draft age. In a circular issued by the War Service Committee of the American Hospital Association it is pointed out that "the only hope of relief is in the seeing that the army's needs are so fully supplied from other sources that hospital interns and residents whether appointed for twelve months or longer may be permitted to complete their hospital contracts and incidentally to obtain the professional education which would enhance their value as army officers."

In view of these facts the committee appeals to the hospital authorities generally to cooperate in obtaining as many applications for commissions as possible and every hospital is asked to urge every intern to apply for a commission in the medical service. The service needs 5,000 hospital trained physicians under forty years of age and it is to be hoped that the War Service Committee can fill this quota so that the younger men may be allowed to complete their term of duty as interns and resident physicians and thus become better fitted for active work under arms, at the same time maintaining the efficiency of the hospitals at a time when that efficiency is a matter of especial importance.

News Items.

Retired Naval Officers Recalled to Service.—Nearly five hundred officers of the Navy and 138 former officers, who resigned in past years to enter civil life, are now serving in the Fleet Naval Reserve. Among them are one retired surgeon general, three medical inspectors, six medical directors, eight surgeons, five past assistant surgeons, and four assistant surgeons.

Resolutions Adopted by the Bronx County Medical Society.—At a meeting of the Bronx County Medical Society, held on Wednesday evening, December 19th, resolutions were adopted by its members expressing complete confidence in the personal and professional honor, integrity, and sincerity of Dr. Herman T. Radin.

The Mayor's Committee on Hospital and Medical Facilities.—Mayor Hylan has requested the Mayor's Committee on Hospital and Medical Facilities, which was organized last year for the purpose of coordinating the hospital facilities of the city for war purposes, to continue its activities, and has designated Dr. S. S. Goldwater to continue to act as chairman of the committee.

Child Hygiene Taught by a Traveling Red Cross Exhibit.—The American Red Cross has arranged an exhibit which is to be carried through France on a motor truck for the purpose of conducting a campaign of education in child hygiene. The exhibit, which was opened in Chartres, France, on January 6th, consists of a motion picture apparatus, attractive pictures, and literature on the hygienic care of children.

Government Declines Sanitarium Offer.—On the recommendation of the Judge Advocate General, Secretary Baker has declined the offer of the municipal authorities of Otisville, N. Y., to loan the government the city sanitarium for a medical depot. The institution was admirably adapted for the use of the department, but included in the offer to the government was a clause to permit its revocation "on thirty days' notice in writing to the Secretary of War."

X Ray Movies.—It is reported that x ray moving pictures showing the bones and joints of the body in their natural operations have been perfected and will soon be used in the base hospitals in the United States and Europe. It is said that pictures have already been taken showing the bones of the elbow and of the knee in motion. Dr. E. L. Crusius, of the New York X Ray Laboratories, is said to be the discoverer of this method of combining the x ray with the moving picture.

Ophthalmic Hospital Appeals for Public Help.—This hospital, which has placed its plant and its surgeons at the disposal of the government, to care for soldiers who may return from the front blind or deaf, but with a possibility of cure, has made an appeal to the public for funds with which to carry on its work. This hospital treats more than 12,000 patients every year.

Health Insurance.—Representatives of the State Federation of Labor conferring in Albany adopted as the chief plank in a legislative program which they will seek to have endorsed the establishment of a State administered health insurance for wage earners. The federation seeks the creation of a bureau of sickness prevention and health promotion within the State Industrial Commission.

Personal.—Major William J. Mayo, Medical Reserve Corps, has been relieved from duty in the office of the Surgeon General of the United States Army and will proceed to Rochester, Minn., and report by telegraph to the Governor of Minnesota for duty as medical adviser.

Major Grayson M. P. Murphy, of New York, has resigned as head of the American Red Cross Commission to Europe and will return to the United States.

War Service Committee of the American Hospital Association.—The War Service Committee of the American Hospital Association has issued a circular letter to its members urging them to take steps to prevent the drafting of interns. This is to be done by inducing each intern to make application for a reserve officer's commission. A complete program of the method to be pursued in protecting the supply of interns is outlined by the committee in the circular letter.

Rules Modified to Admit Nurses to the Army Corps.—Because of the great need for nurses in the Army Nurse Corps of the Medical Department, certain requirements, it is announced, are waived for the period of the war emergency, and the applications of all graduate nurses who are professionally, physically, and morally qualified for service will be given consideration while the emergency exists. Registered nurses are preferred, but registration may be waived for the period of the emergency. It has been announced that 37,500 nurses will be needed in the Army Nurse Corps.

Hospital for Deformities and Joint Diseases.—The Clinical Society of the Dispensary and Hospital for Deformities and Joint Diseases will hold a stated meeting on Tuesday, January 22d. Dr. J. Roth will exhibit some interesting x ray plates and members of the staff will present reports of cases. The paper of the evening will be read by Dr. Howard Lillenthal on Fractures Involving Joints. Dr. Max Strunsky is president of the society; Dr. Samuel A. Jahss, vice-president; Dr. Florence V. Rothstein, recording secretary, and Dr. Alexander M. Gluckstein, corresponding secretary.

The Indian Medical News.—The first number of a new journal devoted to the interests of medical officers of the Indian Medical Service, has appeared. It is published by the Association of the United States Indian Medical Service, Dr. Hugo Muller, M. P. H., secretary editor, and its objects, as stated in an editorial letter to the members of the Service, is to elevate the Service to that, for instance, of the Army, Navy, or Public Health Service, to make the individual member more useful in his sphere of duty, and to raise the prestige and economic conditions of the Indian Medical Service.

The New Medical Advisory Boards.—According to present plans, there will be twenty-nine medical advisory boards for New York, organized from the following thirteen hospital groups: St. Luke's, Columbia University, New York Hospital, Cornell University, University and Bellevue Hospital and Medical College, Flower Hospital, Lincoln Hospital, Fordham Hospital, Methodist Episcopal Hospital (Brooklyn), Brooklyn Medical College, Trinity Hospital (Brooklyn), Jamaica Hospital (Queens), and Richmond County Hospital. Each board will be composed of specialists in surgery; internal medicine; eye, ear, nose and throat disorders; tuberculosis, neurology, urology, x ray, dentistry, clinical laboratory work. With these medical advisory boards established, it is expected that the number of rejections of drafted men for physical reasons will be reduced to a minimum.

Meetings of Medical Societies to Be Held in Philadelphia During the Coming Week.—Monday, January 14th, County Medical Society (board of directors), Samaritan Hospital Medical Society, Section in Industrial Medicine and Public Health of the College of Physicians; Tuesday, January 15th, Mount Sinai Hospital Clinical Society, West Branch of the County Medical Society; Wednesday, January 16th, County Medical Society (business meeting), Section in Otology and Laryngology of the College of Physicians; Thursday, January 17th, North-east and Southeast Branches of the County Medical Society, Section in Ophthalmology of the College of Physicians; Friday, January 18th, Logan Medical Association.

Fatalities from Automobile Accidents.—The annual report of the National Highways Protective Society, issued on January 1, 1918, giving the fatalities on the streets and highways of New York State, including New York city, for the year 1917, shows that during the year 837 persons were killed by automobiles in the State of New York, as compared with 720 for the preceding year, an increase of about 100 per cent. in fatalities in five years. No legislation in New York State of importance has been enacted during that period to put a stop to this great death increase. In the State of New Jersey during the twelve months of 1917 245 persons were killed by automobiles, showing an increase of only twenty over that of the preceding year and only four more than during the same period of 1915.

Meetings of Medical Societies to Be Held in New York During the Coming Week.—Monday, January 14th, New York Ophthalmological Society (annual), Society of Medical Jurisprudence, New York, Association of Alumni of St. Mary's Hospital, Brooklyn, Williamsburg Medical Society, Brooklyn; Tuesday, January 15th, New York Academy of Medicine (Section in Medicine), Tri-Professional Medical Society of New York, Medical Society of the County of Kings, Federation of Medical Economic Leagues of New York (annual); Wednesday, January 16th, New York Academy of Medicine (Section in Genitourinary Diseases), Alumni Association of City Hospital, New York, Women's Medical Association of New York City (New York Academy of Medicine), Medicolegal Society, New York, Northwestern Medical and Surgical Society of New York, Bronx County Medical Society; Thursday, January 17th, New York Academy of Medicine (Stated meeting), German Medical Society, Brooklyn, New York Celtic Medical Society; Friday, January 18th, New York Academy of Medicine (Section in Orthopedic Surgery), Clinical Society of the New York Post-Graduate Medical School and Hospital, New York Microscopical Society, Alumni Association of Roosevelt Hospital.

Free Instruction in Contagious Diseases.—A course of instruction in contagious diseases, similar to that given at the Willard Parker Hospital, will be given at the Kingston Avenue Hospital, Brooklyn, beginning February 5th. Each course will consist of eight lessons, of which six will be devoted to clinical bedside instruction, one to a demonstration of intubation, and one to practical laboratory work. The sections will be strictly limited and only practising physicians will be admitted. No fees will be charged, but physicians entering courses are expected to attend regularly. Courses will be conducted Tuesdays, Wednesdays, Thursdays, and Fridays, at 3 o'clock, at the Kingston Avenue Hospital. The laboratory instruction, on the first Friday of each course, will be given at the Research Laboratory, foot of East Sixteenth Street, Manhattan, at 2 p. m. The first course begins on Tuesday, February 5th, at 3 p. m., and a similar course will be given from March 5th to March 15th. The classes are limited to ten members each, and physicians desiring to participate should register at once with the Bureau of Public Health Education, Department of Health, 139 Centre Street, New York city.

A series of courses, similar to those given in previous years, will be given at the Willard Parker Hospital, Manhattan. The schedule has not yet been arranged definitely, but the first course will probably begin shortly before the first of March. Physicians desiring to participate should register now.

Modern Treatment and Preventive Medicine

A Compendium of Therapeutics and Prophylaxis, Original and Adapted

TREATMENT OF ACUTE MERCURY BICHLORIDE POISONING.

By LOUIS T. DE M. SAJOURS, B. S., M. D.,
Philadelphia.

(Continued from page 37.)

The chief purpose of the Lambert and Patterson treatment for acute mercurial poisoning, described in the preceding issue, is manifestly to promote continuous elimination of the poison through all possible channels, thus indirectly safeguarding all the tissues specially vulnerable to the toxic effects. In the case of the kidneys, however, a particular effort at local protection is made in the administration of potassium bitartrate, sugar, lactose, and an abundance of fluid by mouth, together with the use of potassium acetate by rectum, the salts and sugars being intended to prevent the absorption of water by the renal epithelium, and with it, the interference with diuresis which the swollen cells induce through pressure upon neighboring vascular channels.

Detailed examination into the results obtained by the observers mentioned, in their series of ten cases, shows that the first two of these were merely instances of poisoning by insertion of bichloride tablets into the vagina, each recovering in a few days upon administration of a saline or alkaline douche and a saline colon irrigation twice daily. In one case gastric lavage, followed by castor oil, was also practised. Neither of these patients had shown a marked oliguria, though in one, in whom the poisoning had occurred three days before admission in the hospital and the treatment therefore delayed for the same period, blood and a pus cloud appeared in the urine. Of the remaining eight cases, all poisoned by the mouth, six were admitted within a period ranging from less than one hour to three hours after ingestion of the bichloride, and of these six patients, thus brought early under the treatment, five escaped without any marked decrease in the output of urine—apparently a strong indication of efficiency on the part of the method applied—while the sixth, a case characterized by congenital syphilis and an unusual absence of early vomiting from gastric irritation by the poison, the urinary output progressively dwindled from 396 mls on the second day to two mls on the sixth, in spite of the customary free administration of fluids. This patient had evidently absorbed an unusual amount of the poison, the urine yielding regularly a positive test for mercury for a period of five weeks. In the seventh case (Case 3 in Lambert and Patterson's article) twenty-four hours had elapsed before admission and scantiness of the urine had already been noted some hours before institution of the new treatment, yet the urinary output, noted as 180 mls on the day of admission, increased by the fourth day to 2,450 mls, only to diminish later, when the continuous rectal irrigation had temporarily to be replaced by daily single colon irrigation

owing to soreness of the rectum. The last case (Case 7) seems less conclusive as regards proving the efficacy of the treatment, bichloride tablets having been taken on several days before the beginning of treatment without any decrease in the output of urine.

As will have been noticed, in none of the above cases had anuria developed before the Lambert and Patterson treatment was begun. While the cases, therefore, tend to show that this treatment may prove effectual regularly where anuria has not yet supervened, no definite evidence is presented as to its lifesaving value for patients anuric when first seen. The observers themselves state that in such cases "favorable results cannot always be expected. While it is perfectly possible to reestablish urination, the cases quite regularly go on to a fatal termination, with degenerative liver changes, and a colitis of the so-called diphtheritic type." Cohen and Bernhard, 1916, have since reported a case with recovery in which the Lambert-Patterson treatment was only begun five days after ingestion of the poison and in which the urine was said to have been almost completely suppressed for twenty-four hours before admission to the hospital; on the day of admission, seventy-five mls of urine were obtained by catheterization, and consentaneously with the treatment the output showed an increase to 700 mls in the succeeding four days. Although it seems rather clear that the treatment was of benefit, this case was manifestly not one of complete anuria, and there is no definite evidence that anuria would actually have occurred if the Lambert-Patterson treatment had not been applied. Again, in a case treated in 1915 by Hatfield, before the publication of the new treatment, and in which anuria was present for seventy-two hours, administration of Fischer's solution by continuous proctoclysis did not prevent ultimate death from colitis and exhaustion, though the urinary flow was reestablished and even increased to about normal during the last week of life. From these observations it is clear that, if the patient is to be given every possible chance, the Lambert-Patterson treatment must be instituted early, to counteract, if practicable, in its incipency the insidious effect of the poison on the kidneys. Renal injury such as to diminish markedly the output of urine involves a possibility that the treatment may already be too late. The treatment designed to spare the kidneys should be begun as soon as, by a chemical test, the elimination of mercury in the urine can be detected—if not sooner. Such a test, e. g., the method of Vogel and Lee, 1914, utilized by Lambert and Patterson themselves, is likewise of value to establish the diagnosis of mercurial poisoning in doubtful cases and to determine the length of time the treatment should be continued.

In the Vogel and Lee procedure, the mercury is first separated from albumins, then sublimed in a sealed tube with a small piece of dentist's gold. In the presence of mercury a silvery patch of amalgam

forms on the gold. In several of the Lambert-Patterson cases, elimination of mercury by the kidneys, colon, and stomach persisted for some days after all toxic symptoms had passed off. It is deemed permissible, as a rule, to discontinue the treatment after two negative examinations of the urine on successive days. When unusually large or repeated doses are concerned, or treatment is started only some days after the poison has been taken, prolonged treatment, up to a duration of three weeks, may be required.

In addition to their beneficial osmotic effects in the renal tubules and elsewhere, the potassium acetate and bitartrate administered in the Lambert-Patterson treatment are probably of assistance through their alkalinizing action. Lewis and Rivers, 1916, noticed in bichloride poisoning a lowered tension of alveolar carbon dioxide which would seem to indicate the presence of an acidosis during the early stages of the intoxication. In the kidneys, moreover, the toxic action of the mercury on the cells of the tubules has been thought to result in asphyxia of these cells, this in turn causing an acid condition which, in the light of Fischer's views, leads to swelling of the epithelium and interference with the urinary output. The alkalinizing action of the potassium salts, counteracting the local acid condition, thus may assist the osmotic action of these salts in obviating the swelling of the renal cells. Recently, experimental observations have added new evidence in support of the utility of alkalis in renal intoxication.

(To be concluded.)

Simple Method of Performing Extraperitoneal Cesarean Section.—T. H. Cherry (*American Journal of Obstetrics*, October, 1917) has the patient prepared as for any abdominal section. The incision is made in the median line from symphysis to umbilicus through skin, fat, and fascia of the recti. The muscles are separated by blunt dissection, exposing the transversalis fascia and peritoneum. The edges of the muscle tissue are bluntly dissected off the peritoneum for a short distance until the deep epigastric vessels are seen. The peritoneum is opened vertically, and the cut edges of the parietal peritoneum then sutured to the visceral peritoneum, leaving an oval area about five inches long and three and a half inches wide in the lower uterine segment exposed. This continuous suture is interrupted and tied at several points to prevent its acting as a pursestring. The general peritoneal cavity having thus been shut off, the thin lower uterine segment is incised in the midline for four and a half inches, the blades of an obstetrical forceps introduced to the sides of the fetal head, and the child extracted. Pituitrin, one mil, is given intramuscularly, followed at once by thirty minims of ergotol. The uterine wound is then closed by interrupted chromic gut sutures, a continuous seromuscular suture superimposed, and the edges of the parietal and visceral peritoneum sutured together. The rest of the wound is then closed as usual without drainage. Clinically this operation gave satisfactory results.

Flavine in Recent War Wounds.—Hamilton Drummond and J. W. McNee (*Lancet*, October 27, 1917) report the results of their use of flavine as a wound dressing in cases coming under operation within four to twelve hours of injury. They found that the best results were obtained by the use of a 1:1000 solution as the primary application, followed by 1:5000 for subsequent dressings, or 1:10,000 when employed according to the Carrel technic. Although the majority of wounds responded very well to the drug it was shown that it had relatively little bactericidal action and did not sterilize the wounds. It was also found that the continued use of the 1:1,000 solution produced some necrosis of the fibrinous membrane which formed in the wounds. Even though living bacteria were found in the wounds after the use of flavine such wounds were notably free from the phenomena of inflammation and septic infection and severe cases of gas gangrene did not occur although the organisms were repeatedly demonstrated in the wounds. The greatest disadvantage of the use of flavine in wound treatment was found to be the fact that the wounds healed with extreme slowness, or almost not at all under its continued application. If the initial dressings of flavine were stopped, however, after about three days and another dressing used, the wound healed rapidly.

Primary Suture of Wounds.—G. Gross (*Bulletin de l'Académie de médecine*, October 23, 1917) lays stress on Tissier's work which showed that the advisability of immediate closure of wounds depends especially upon the nature of the germs with which the individual wound is infected. Development of the anaerobic organisms to which putrid changes in war wounds is due necessitates not only contused tissue or tissue deprived of its blood supply but also the simultaneous presence of one or more aerobic organisms. The extension of the gangrenous process depends on the aerobe present. In severe infections the aerobe present is always the streptococcus. Hence the conclusion of Tissier and Gross that any war wound not infected with the streptococcus is amenable, after suitable surgical measures, to immediate closure, and should thereupon heal without difficulty. As direct examinations of pus or serous discharge yield no precise indication, the decision should be based only on cultures. Of 549 wounded men upon whom operative work was performed in a hospital under the author's direction, 430, or 78.8 per cent., were sutured. Of the 759 wounds sutured in these patients, 675 healed by first intention, or 88.8 per cent. In 496 of these the wounds involved soft tissues, though many were severe wounds, e. g., amputation for crushing injuries, through and through wounds at the root of the thigh, explosive injuries of the buttock, and deep missiles in the neck. There were 209 fracture cases. In forty-seven instances partial reopening of the wound followed suture. These included thirty-eight cases of slight infection and nine of gas formation, without any severe constitutional reaction. In thirty-seven additional cases, completing the series of 759, the wounds were voluntarily reopened upon definite discovery of the streptococcus in them. Free removal of injured tissues is a prerequisite to success in primary wound closure.

Treatment of Osteoma by the X Rays.—Chevrier and Bonniot (*Presse médicale*, October 25, 1917) emphasize the fact that surgical treatment of an osteoma varies in its results according to the stage of the growth. Young osteomas show a central bony mass and a peripheral shell of varying thickness composed of young cells gradually undergoing osseous transformation. This process may occupy months or years, and the only means of ascertaining the precise condition of the growth is the use of the x rays. An osteoma may be classed as young as long as its x ray shadow is smaller than its clinical size. Any young osteoma taken out surgically without complete removal of its shell, the limits and thickness of which cannot be ascertained, will inevitably recur. Adult osteomas, which have stopped developing and have no such shell, yield an x ray shadow equal to their clinical size and will not recur upon surgical removal. Artificial aging of osteomas by means of the x rays was attempted by the authors in two cases, with unexpectedly good results. The osteomas involved the femur and second metatarsal, respectively, and both followed wounds. Not only was the desired rapid aging of the growths secured, but the osteomas almost completely disappeared in both cases. Application of this new treatment is especially advocated in luxations of the elbow, both for the prophylaxis and curative treatment of the osteoma which not infrequently follows. All such luxations should be reduced under general anesthesia and then subjected to early prophylactic x ray treatment. By this type of management all the troublesome elbow osteomas could probably be obviated.

Wounds of the Knee Joint.—Sir Berkeley Moynihan (*Boston Medical and Surgical Journal*, November 22, 1917) says that in all cases of wounds of the knee joint the limb should be fixed immovably upon a splint at the earliest possible moment, until circumstances permit of a complete operation. At the casualty clearing station or other operating centre, an x ray examination is made in all cases. The whole limb is then prepared for operation. The essential features in all operations are excision of the wounds and of the track of the projectile after preliminary sterilization by the cautery or otherwise and a free exposure of the joint either by enlarging existing incisions, by long internal or external incisions, or by the formation of a flap by division of the patellar ligament. All foreign bodies must be removed from the joint; even the smallest piece of clothing or of metal may be the nidus of a continuing infection. The wounds are closed in layers by catgut sutures. Drainage is secured by leaving a gap in the line of suture of the synovial membrane, or by leaving a tube close down to but not into the joint. Drainage tubes are never placed within the joint cavity; they do not drain the joint, they are harmful in their effects upon the delicate synovial membrane, and they are often a channel by means of which infection is conducted to the joint. In cases of severe infection of the joint by staphylococcus, or especially by the streptococcus, the wounds must be reopened, the synovial membrane stitched to the skin, free drainage of the joint secured, and

the Carrel-Dakin or other method of progressive sterilization of the wound adopted. In more severe cases, with an infection rapidly gaining ground, excision of the joint may be necessary. In cases of severe comminution of the articular ends with much loss of substance, a resection of the joint is performed forthwith. In severe and extensive wounds with heavy infection, the method of resection with wide, temporary separation of the ends of the bones should be practised. In cases of very extensive damage, especially with infection, amputation is desirable.

Treatment of Infected Wounds.—Rutherford Morison (*British Medical Journal*, October 20, 1917) summarizes his technic, after recording some illustrative cases to show the efficacy of the method. The patient should be anesthetized, the wound covered with gauze wrung out of 1:20 phenol, and the surrounding skin thoroughly cleaned with this solution. The wound should then be freely opened to permit inspection of its entire cavity if possible. The finger or a probe should be inserted to the bottom of the wound and held until exposed by the incisions. Care should be taken not to damage nerve trunks, but bloodvessels may be ligated and cut if necessary. Foreign bodies should be removed and the cavity cleansed with a Volkmann's spoon and dry sterile gauze. The cavity should next be mopped with methylated spirit, including the surrounding skin, and dried. The whole is then to be filled with bismuth iodoform paraffin paste which is to be rubbed in thoroughly, the excess being removed so that only a thin layer is left covering the entire surface. A dressing of sterile gauze and an absorbent pad is laid over the wound and held by adhesive plaster. This dressing does not need to be changed for days or even weeks if there are no constitutional symptoms and no local pain. The outer pad may be renewed if it becomes saturated with discharge, the pad being soaked with methylated spirit and a new one applied after wringing it out of the same spirit.

Vegetable Foods for the Diabetic.—Ruth A. Wardall (*Journal A. M. A.*, December 1, 1917) calls attention to the fact that the necessary elimination of most fruits and many vegetables from the diet of the diabetic on account of their carbohydrate content renders his diet monotonous and undesirably diminished in bulk. The usual analyses of foods state the percentage composition in terms of the several types of constituents and vegetables are commonly divided into the five, ten, fifteen, and twenty per cent. carbohydrate groups. The products of chemical analysis are not of necessity the same as those of digestion, thus chemically both cellulose and the hemicelluloses are carbohydrates, but these are not generally utilizable by man. The use of thrice cooked vegetables has been advocated, since they are commonly believed thus to have their carbohydrate content much reduced. An examination of this matter shows that the effectiveness of this water extraction varies with different vegetables and with differing conditions. Spinach and celery contain comparatively little carbohydrate to begin with and they give up a considerable part of it on a few boilings with water. On the other hand

cauliflower is relatively rich in carbohydrate and many extractions with boiling water fail to reduce the carbohydrate materially. Carrot also yields much of its carbohydrate easily, but if it be extracted with water at 60° C. instead of boiling the removal of carbohydrate is more complete and more rapid. The same influence of temperature on extraction is found in the cases of eggplant, parsnip, and beet, while this process has little effect on cabbage. The common field mushroom is unique in being suitable for use without any extraction for it has no extractable carbohydrate and its nitrogen is not present in the form of protein. Further studies along these lines are needed.

Wound Treatment by Brilliant Green Paste.—A. Rendle Short, J. S. Arkle, and C. King (*British Medical Journal*, October 20, 1917) record a series of cases of badly infected wounds in which they obtained excellent results by the use of Hey's paste of brilliant green, boric acid, French chalk, and liquid paraffin. They believe that the use of this paste in a way similar to Rutherford Morison's has several advantages over the bismuth iodoform paste of that author. This paste is not poisonous, as the bismuth paste has sometimes proved to be; its use is entirely painless; it almost completely sterilizes the great majority of wounds in three days; even those complicated by extensive bone injury; it leaves no residue to interfere with healing or to cast a confusing shadow on subsequent radiography of the part; and finally, as with Morison's bismuth paste, the dressings do not require changing more often than every four days. Before the use of the paste the entire wound surface should be excised, preferably after staining the dead tissues with a 1:200 solution of brilliant green.

Treatment of Wounds Infected with Bacillus Pyocyaneus.—Philip Turner and G. Richardson (*British Medical Journal*, September 29, 1917) emphasize the fact that this form of infection is not uncommon in military wounds and that, while not very dangerous to life, it is chronic in its course and extremely difficult to check by the usual methods of treatment. After trying various methods the authors were led to use eusol in the form of hot compresses and met with prompt results. On the strength of their rather extensive experience of this method they recommend the following. First, every wound should be cultured for the *Bacillus pyocyaneus*, whether it presents profuse green pus or not. If the organism is present, treatment should be begun at once by the application at four hour intervals of thick gauze compresses wrung out of five per cent. eusol which has just been boiled. The compresses should be applied as hot as the patient can bear them and their application should be continued for two to three days after the green color has disappeared from the pus. Even in very chronic and resistant cases the response is usually very prompt and in most cases the green color and odor will have disappeared in twenty-four to forty-eight hours. Where there are deep sinuses these should be irrigated twice daily with a very hot solution of eusol and the eusol compresses applied. The treatment should be controlled by frequent bacteriological examination of the wound secretion.

Fundal Hysterectomy to Reduce the Menstruating Surface.—Gordon K. Dickinson (*American Journal of Obstetrics*, November, 1917) writes concerning the cases in which, after confinement, either from general debility or nerve exhaustion, involution and infection arise, resulting in a large fibrofatty uterus encouraging hyperemia and hyperplasia of the endometrium. In another group of cases, with more severe infection, there results either a generally fibrotic uterus or one with special condensation of fibrous tissue about the bloodvessels; in either case the endometrium becomes atrophic. In all these conditions there result menorrhagia, prolonged periods, evacuation of clots, and particularly in the cirrhotic type, continued leakage of blood. Anemia and increasing debility supervene. To remedy such a condition, curettage is ineffectual, Boidt's zinc chloride method is dangerous for general use, and radium is difficult to procure. Dickinson has evolved a method which consists in excising a wedge shaped piece of the uterus, thus removing half or more of the endometrium and reducing the menstrual surface with lessened liability to interference with the ovaries and their important functions than a more complete hysterectomy. The operation is done *per vaginam*. After placing a pursestring round the anus and retracting each labium, the operator pours an ounce or more of 3.5 per cent. iodine tincture in the vagina. The cervix is brought down with volsellum, a transverse incision made anterior to it, the bladder separated from the uterus, the peritoneal cavity opened, and the fundus brought into the vagina and inspected. Clips are applied along the uterus to compress the circulation slightly and act as retractors. The wedge shaped piece is then removed, both fornices cauterized thoroughly, the cervix likewise, and the flaps approximated. The peritoneal surface is further brought together by running catgut and the operation completed.

Persistent Prostatic Abscess Cavities.—Frank S. Crockett (*Indianapolis Medical Journal*, November, 1917) describes his method for the obliteration of these cavities. After the prostate is softened and the cavity persists, he cocaineizes the posterior urethra and passes an ordinary urethroscope into the prostatic urethra. With one finger in the rectum the fenestra of the urethroscope can be placed directly over the cavity, care being exercised that the caput is not in the field. A long pointed knife is then passed and a stab wound made through the urethral wall into the cavity, the finger in the rectum acting as a guide. This is repeated if a cavity exists in the other lobe. A blunt pointed instrument is then introduced, passed into each cavity, and with it the walls are gently explored, still using the finger in the rectum as a guide. This blunt instrument also serves the purpose of enlarging the drainage openings. A modified Keyes-Ultzmann instillator is introduced into each cavity, ten to fifteen drops of a one per cent. solution of silver nitrate are injected and gently worked about the cavities by the finger in the rectum. On the second, fourth, and sixth days the silver nitrate injection is repeated with the massage. This number of treatments is generally sufficient to close the cavities, but treat-

ment must be continued until closure is complete. The patient is not detained from his usual occupation by this treatment. Crockett says that the postoperative effects locally have been complete healing with no marked distortion of the neck of the bladder or interference with the bladder function. By rectum the site of the old cavity becomes solid with no evidence of fluid accumulation. There has been no interference with the sexual function. He considers that the persistence of such cavities are a constant menace to the patient's health, and that they can be quickly cured by this method of treatment.

Quinine and Galyol in Subtertian Malaria.—A. W. Falconer and A. G. Anderson (*Lancet*, September 29, 1917) call attention to the previous somewhat fruitful use of salvarsan and neosalvarsan in the treatment of malaria and record the treatment of six cases of malignant cerebral subtertian malaria with a combination of quinine and intravenous injections of galyol. In all of the cases the administration of quinine alone, either by mouth or intravenously had failed to check the disease, while the addition of galyol promptly rid the body of the parasites and cured all of the patients but one who died of a complicating pneumonia. The use of galyol alone in other cases did not destroy the parasites. In one patient the condition was benefited by the combined treatment but his blood was not wholly rid of the crescents. The treatment seemed promising in the few cases in which it had been used and seemed to have the advantage of being free from danger. The dose of galyol usually used was 0.4 gram.

Open Flap Method of Treating Perforating Brain Wounds.—J. G. Hunt (*Lancet*, September 29, 1917) advocates this method as giving more satisfactory results than any other. It consists in first turning back a good sized flap of scalp and perichondrium so as to expose the wounded area freely. The wound in the bone is then enlarged and all loose or depressed fragments are removed. The dura is disturbed as little as possible and foreign bodies are sought for only when shown by x rays to be superficial. If the brain is much damaged and the wound in the dura small this is enlarged by radial incisions which extend to the bony margins of the opening. A strip of iodoform gauze is then inserted all around between the dura and the edges of the bony opening to stimulate the formation of defensive adhesions. A loose layer of iodoform gauze is laid over the whole bared area and the flap either loosely replaced or held retracted from the wound. Outer dressings of plain gauze wet with saline or boric acid are applied. These are changed twice daily but the iodoform gauze is not disturbed for about a week. Then a cerebral hernia will be found to have developed and often fragments of bone will be found to have been expelled. The deep dressing is replaced and changed twice a week. By the end of the second week the hernia will have reached its maximum size and will begin to recede. It will no longer project above the bony margins of the wound by the end of the fourth to sixth weeks and then the skin flap may be replaced and sutured down to the healthy granulations which cover the old hernia.

Germicidal Power of Flavine.—R. Tanner Hewlett (*Lancet*, September 29, 1917) records the results of a series of tests of the germicidal power of this new antiseptic against several types of bacteria in different mediums and in varying numbers. He concludes that when large numbers of organisms are used the drug is not specially powerful as a germicide, that it is far inferior to many in common use in the presence of pus, and that it is very slow of action.

Intraspinal Injections in Syphilis of the Nervous System.—John A. Fordyce (*Journal A. M. A.*, November 3, 1917) contends, in a polemic reply to a previous paper, that intraspinal treatment relieves or cures some cases of tabes, syphilitic cerebrospinal meningitis, meningomyelitis, meningoencephalitis, and optic atrophy with positive spinal fluid findings after the failure of other methods of treatment including the intravenous. It is also the sole remaining method of treatment in cases developing an intolerance to arsenic and is not so dangerous as the intensive intravenous treatment, when properly carried out. There are cases in which the intravenous treatment will do no more than arrest the progress of the disease or stop the acute symptoms, such being those with destruction of tissue which cannot be repaired by any form of treatment. It is a mistake to use either the biological or the clinical findings alone as criteria of improvement; both must be taken into consideration.

Treatment of Enlarged Cervical Lymph Nodes in Children.—Charles Greene Cumston (*British Journal of Children's Diseases*, July-September, 1917) considers it of the utmost importance to make an exact diagnosis of the nature of enlarged cervical lymph nodes in children. When due to a local cause the head and face must be maintained in a state of absolute cleanliness. Parasites require an energetic cleaning of the scalp with 1:500 sublimate after which the scalp is to be rubbed with gray ointment or camphorated alcohol and the ova removed by the application of hot vinegar and a fine tooth comb. If there is an eczema of the scalp the diet must be regulated. Locally, compresses wetted with tepid boric acid solution. Ointments of zinc oxide, salol in which vaselin or starch glyceride has been used as an excipient are bad. Careful attention should be paid to buccal antiseptics. The child should gargle several times daily with:

Potassium chlorate,	2-5 grams;
Syr. rub. Id.,	30 grams;
Aque.,	110 grams.

M. A dessertspoonful to be gargled and swallowed every two or three hours.

If fever is present suppositories containing from three to four grains of quinine sulphate or acetanilid should be used. Chronic angina is to be treated by codliver oil and a stay at the seashore. Tuberculous adenitis requires general treatment. If the lymph nodes are adherent or progressing toward suppuration surgical intervention is indicated. Tuberculin should not be used. Heliotherapy or injections of camphorated naphthol or camphorated thymol are useful when the lymph nodes are very large or have undergone calcification. If the glands are too general for removal Fowler's solution should be used.

Miscellany from Home and Foreign Journals

A Hitherto Unrecognized Form of Pulmonary Syphilis.—Leredde (*Paris médical*, September 15, 1917), from clinical and serological study of soldiers suffering from acute bronchitis, with or without pulmonary congestion, emphysema, or asthmatic symptoms, asserts that the most common of all the forms of lung syphilis has hitherto remained unrecognized. Among twenty cases reported, seven had a positive Wassermann reaction, ten more had undoubtedly syphilitic clinical stigmata, and the remaining three were probably syphilitic. Congenital syphilis is the form of syphilis referred to in all instances. All the patients were relatively young men, and in the majority the pulmonary disturbance dated back to childhood or adolescence. All had dyspnea on exertion and a few even at rest, in the absence of any cardiac or renal impairment and, as a rule, of stethoscopic physical signs in the lungs. They were subject, moreover, to repeated attacks of bronchitis and occasionally to lung congestion. Several, in spite of their relative youth, showed the anatomical and functional signs of pronounced emphysema. In some, attacks of asthma were experienced, and in two the dyspnea was of a familial type. Accessory symptoms were severe headache, attacks of dizziness, and an acroasphyctic state of the hands. The pulmonary condition is ascribed by the author to a gradually progressive syphilitic sclerosis of lung tissue, extending to the bronchioles and smaller bronchi. The expectoration and general health are variable, but the temperature is generally irregular. Such cases are predisposed to the ordinary bronchial infections and to tuberculosis. Modern laboratory methods, including study of the spinal fluid, should be utilized in their diagnosis, and in the treatment energetic antiluetic measures, especially arsenobenzol, should be applied.

The Bordet-Wassermann Reaction in Malaria.—S. I. de Jong and Arthur Martin (*Presse médicale*, October 25, 1917) studied this question in 200 cases. In the great majority of cases the Wassermann reaction, conducted according to the Alfred Bauer-Hallion technic, proved positive only in subjects with manifest syphilis or admitting a former syphilitic infection. Conversely, in a large number of cases clinically free of syphilis the reaction was negative in spite of a known malarial infection, frequently with recent paroxysms. The impression was obtained that, provided one employs a satisfactory procedure, preferably performing the test both with unheated serum and by the typical Wassermann method, the Wassermann reaction retains all its value for the diagnosis of syphilis in malarial patients, at least in the absence of an acute paroxysm at the time. Studying further the reaction in about twenty cases during an actual malarial paroxysm, with malarial organisms demonstrated in the blood but no clinical evidences of syphilis, the authors observed two types of response. In some cases, in which the specimen of blood had been secured during a mild paroxysm or after the chill, the fixation reaction proved negative by both methods

and the natural hemolytic power of the serum, ascertained through the Bauer-Hallion procedure, proved unimpaired. In others, however, the blood having been obtained during the chill, the unheated serum method showed the natural hemolytic power to have been greatly reduced or abolished. In the tubes containing antigen, such a condition would naturally lead to the belief of a positive Wassermann reaction which in reality did not exist. Deficient natural hemolytic power of the serum may occur not only in the malarial chill but also in any other infectious state with sudden febrile onset, e. g., pneumonia. In testing a malarial subject for syphilis, the test should not be made close to the time of a paroxysm. Both heated and unheated serum should always be used. The Bauer-Hallion technic is of service because it permits of ascertaining the natural hemolytic power of the serum. Quinine did not appear to alter the results of the reaction.

The Colloidal Gold Test.—J. H. Black, Louis Rosenberg, and R. B. McBride (*Journal A. M. A.*, December 1, 1917) point out that there is a general agreement among workers that the colloidal gold test is of considerable value in diagnosis of diseases of the central nervous system, but that satisfactory solutions are difficult of preparation. The factors which enter into the preparation of the solutions and which may cause variations in the usefulness of the solutions have been subjected to careful investigation by the authors who conclude as follows: Singly distilled water, made properly, may be stored safely in clean glass for many days; lack of cleanliness of the glass is the usual cause of protected solutions; the reagents may be used as stock solutions; if the technic is carefully followed turbid solutions which arise from slow or irregular heating cannot be corrected; solutions which are poor on account of the use of a minimal amount of alkali or formaldehyde may be corrected, the latter becoming suitable for clinical use; oxalic acid is not necessary; the presence of carbon dioxide is of no consequence; and solutions which are alkaline when prepared or after standing can be made neutral by reheating and adding formaldehyde. The technic of preparing a satisfactory solution is to place 100 mils of distilled water in a beaker on a wire gauze over a high flame and add one mil of a one per cent. solution of gold chloride and 0.7 mil of a two per cent. solution of sodium carbonate. Heating should be rapid, and when boiling is just beginning, half a mil of a one per cent. solution of formaldehyde should be added and the solution stirred vigorously until reduction is complete, which should take not more than two minutes. The application of the test in a series of 169 examinations on fifty-nine patients showed that a typical syphilitic reaction is nearly constant in syphilis of the central nervous system and that this reaction is more delicate than the Wassermann test and more specific than pleocytosis or the globulin reaction. The test seems to be the most trustworthy of all as an aid in diagnosis. A paretic curve is always found in known paretics, but it may occur in other forms of central nervous system syphilis.

Mechanism of Mental Torticollis.—L. Pierce Clark (*Archives of Diagnosis*, July, 1917), after careful analysis of several cases of this obstinate functional disorder, is disposed to agree with those who deem the primary fault in these cases to be in the general mental makeup. The defect is one of emotional infantilism, the torticollitic being a profoundly neurotic individual whose infantile emotional life is an arrest or fixation in a diffused way on the parent, on himself, and to a less degree upon his own sex. Because of this emotional arrest the main trends of character are weak and inadequate, and in the early adult period, with new adaptations to complicated life tasks, and especially toward the opposite sex, the subject breaks down with outspoken psychoneurotic symptoms. Usually the torticollis is not one of the first nervous symptoms, but occurs later along with the efforts at repair of the nervous illness. It represents a turning away from the difficulties of life and a regression to crude acts or movements with an intense satisfaction content to the unconscious, infantile life. The patients examined were all muscularly autoerotic, and had placed great dependence upon these satisfactions in infancy. Their feelings of inferiority and inadequacy were like those of profound psychasthenics. Hence the fact that such subjects do not submit readily to psychoanalysis. Weeks and months of readjustment of the emotional life by reeducation must be instituted between certain phases of analysis. By such means the great majority of cases can be cured, though much time and patience are required.

Clinical Course and Diagnosis of Trachoma.—M. H. Foster (*Journal A. M. A.*, December 1, 1917) describes trachoma as a specific, transmissible, destructive inflammation of the conjunctiva, which is characterized by the formation of more or less typical granulations of follicular or papillary form, with ultimate formation of scar tissue, of marked chronicity, and intractable to all local treatment. There are two clinical forms of the disease, the fulminating and the "slow" types. The former is a very acute process, while the slow form may begin acutely, although it is essentially subacute or chronic in its course. The diagnosis of trachoma is not as easy as some would pretend, for several other conjunctival inflammations may produce granulations closely resembling those of trachoma. The one absolutely characteristic feature of trachoma is the formation of scar tissue and its typical distribution. To make a diagnosis it is necessary to know how to examine the eye and to know the appearance of the normal as well as the trachomatous conjunctiva. The disease is most frequent and most typical on the conjunctiva of the upper lid and in the cul de sac. The examination should be made by everting the upper lid over a bent loop glove buttoner, which is the best instrument of all for the purpose. When pressure is made by this instrument the normal conjunctiva shows a white area which shades imperceptibly into the normal pink of the surrounding area. In trachoma the characteristic feature under such conditions is that with the proper pressure uneven, irregular, blotchy patches of white appear, representing scar tissue. Between these areas the conjunctiva remains red. The symptoms and the

pathological changes in trachoma are described in detail and it is pointed out that while the granulations are very characteristic they may be imitated closely by other diseases. The ultimate outcome of the disease varies from insignificant scarring in the mildest cases to marked deformity of the lids with trichiasis, corneal ulceration, and even loss of vision in the severer cases. The treatment of the disease is unsatisfactory at best and no case can be considered as finally cured until the entire conjunctiva of the upper lids has become transformed into smooth, white, avascular scar tissue and the lower lids are devoid of evidences of the disease.

Intestinal Obstruction.—John William Draper (*Journal A. M. A.*, November 24, 1917) reviews his own work and that of others on the cause of the symptoms and the rapid death which results from partial or complete obstruction to the intestine in the region of the duodenum and upper jejunum. He also records some recent experiments on obstruction in the colon and concludes that in the case of obstruction in either location the cause of symptoms and death is a perversion of the functions of the enzymes. The symptoms are far more acute and death much more rapid when the obstruction is in the duodenojejunal region owing to the fact that this is the region of greatest enzymatic activity. The similarity of symptoms in both high and low obstruction is due to a close similarity in the embryological origin of the two portions of the intestine. The studies also show that the syndrome called intestinal toxemia is merely a subacute or chronic manifestation of the same kind as that of acute obstruction, modified by the part played by bacterial infection. Constipation should be regarded as a natural protective phenomenon by which an attempt is made to put the intestine at rest, and the symptoms which often occur associated with it are not those of constipation but rather of the condition which brought about the constipation.

An Investigation of the Chemical Composition and Biological Availability of Peptone.—Lewis Davis (*Journal of Laboratory and Clinical Medicine*, November, 1917) studied seven brands of bacteriological peptone, including six domestic products, and Witte's peptone as a standard. In addition, two experimental peptones were examined. Tables giving the physical properties, the reactions of peptone samples in one per cent. solution, and the analyses of the samples, show much variation in the materials worked on, and it would appear that physical characteristics and gross chemical analyses are of secondary importance in determining the bacteriological availability of a peptone. Information of a more valuable nature may be obtained from a determination of the protein hydrolysis products. Comparative values of practical worth are best shown by certain biological tests, permitting of quantitative estimation, such as the elaboration of diphtheria and tetanus toxins, and to a lesser degree, the production of indol. The domestic products tested gave either weak or no diphtheria toxin, in contrast to the Witte sample, which gave a decidedly potent product. However, the American peptones did furnish a satisfactory tetanus toxin, and in some cases, showed an indol producing power.

Localized and Interlobar Pneumothorax Complicating Pulmonary Tuberculosis.—M. Fishberg (*Archives of Internal Medicine*, November, 1917) points out that these conditions are frequent in chronic phthisis, though often overlooked and confounded with large cavities. Differentiation is of importance because the prognosis is as a rule much better in the cases with the localized pneumothorax, and is also advisable occasionally when one intends to induce therapeutic pneumothorax despite signs of an excavation on the opposite side. The history of the onset is of great significance, no large cavity developing suddenly, while signs of a localized pneumothorax appear in a few minutes. Usually, with the latter, there is a sudden change for the worse, with a sharp pain in one side of the chest, dyspnea, cyanosis, prostration, etc. Some cases succumb in a few days, weeks, or months, but in many, after the acute symptoms subside, the general condition and even symptoms such as cough, expectoration, and fever are improved by the pneumothorax. In the latter, the cavity is generally dry, no adventitious sounds being audible, while large cavities usually show râles and gurgles. The breath sounds in pneumothorax are distinctly amphoric or metallic, a metallic tinkle is sometimes heard, and whispering pectoriloquy is common and pronounced and is distinctly or exclusively heard high up in the axilla. In pneumothorax tympany is more frequent, and response to the coin test is at times elicited. Separation of the intercostal spaces, when found, is pathognomonic of localized pneumothorax. In most doubtful cases, the x rays are invaluable, a bright, circumscribed area, lack in lung markings, when not surrounded by a thick, dark shadow, being pathognomonic. Cavities are usually multiple and contain secretions changing intermittently in amount and bridges of connective tissue and bloodvessels.

Posterior Adenoiditis as a Starting Point of General Infections.—G. Rosenthal and J. Cheville (*Paris médical*, October 27, 1917) assert that investigations made by them in relation to cases of cerebrospinal meningitis developing in a military garrison confirmed the view that nasopharyngeal infection plays a most important part in this disease. Cytodiagnostic research showed definitely that posterior adenoiditis is the primary, fundamental lesion and both antedates and follows the intraspinal suppurative process. The adenoiditis being quite painless, its significance has been overlooked; hence the mistake usually made of applying intraspinal specific therapy for a nasopharyngeal infection only secondarily involving the tissues which surround the spinal cord. More recent studies are stated to have demonstrated that many instances of widespread infection, apparently without localization, are likewise the result of posterior adenoiditis due to various microorganisms, with subsequent septicemia or secondary foci. Study of nasopharyngeal swabs obtained by Dopfer's method, originally intended for the detection of carriers, permits of separating such diffuse infections into two groups, the first without and the second with adenoiditis. In the first group the normal cytodiagnostic formula is noted, cells being few, chiefly epithelial, with only occasional bacteria. The second

group shows very many polynuclear cells, with marked changes in their nuclei and protoplasm. A simple smear suffices to show a single predominant bacterial organism, e. g., a coffee grain Gram negative organism, often *Micrococcus catarrhalis*; numerous small bacilli, Gram negative and staining with difficulty, as Pfeiffer organisms; or candle flame, Gram positive diplococci—pneumococci or enterococci. Culture methods supply a more precise microbic formula. Repeated nasopharyngeal cytodiagnosis permits of prognostically tracing out the course of the disease. Local treatment by disinfection with Vincent's solution for carriers and intranasal injections of oil with eucalyptol, gomenol, or resorcinol by means of Marfan's syringe shortens and renders milder these cases of "grippe without localization" by influencing the original focus of the disease.

Surgery of X Ray Lesions.—Lewis L. McArthur (*American Journal of Röntgenology*, October, 1917) subdivides the subject into the following grouping: 1, Röntgen ceratoses; 2, acute burns, second and third degrees; 3, chronic burns—white gangrene; 4, carcinoma developing in cicatrices or ceratoses. Of these, Röntgen ceratoses are the most common. The best treatment for this condition is a removal of the ceratosis and the substitution of a Thiersch skin graft. The ultimate great danger in x ray burns is carcinoma.

A Modified Wassermann Technic Based upon the Rapid Fixation of Complement Present in Human Serum.—C. J. Bartlett and A. L. O'Shansky (*Journal of Laboratory and Clinical Medicine*, November, 1917) describe a method which employs the natural complement and the antisheep amboceptor of the patient's own serum, and in which there is no preliminary incubation at 37° C. for complement fixation. The method seems to be more delicate and more accurate than the routine Wassermann reaction, and does not appear to give an undue number of false positive tests.

Fractures of the Os Trigonum.—M. Ménard (*Presse médicale*, July 26, 1917), studying from the standpoint of workmen's compensation for occupational injury, fractures of this small bone, situated on the posterior portion of the astragalus, found in x ray examinations that in seven per cent. of cases the os naturally fails to unite with the astragalus. Such failure of union, moreover, when present, is always bilateral. These points are important at times in their medicolegal applications, confusion of a fracture with what is merely an anomaly being unlikely if they are borne in mind.

Relation of the Case of Cerebrospinal Fever to Positive Contacts.—P. Fildes and S. L. Baker (*Lancet*, October 20, 1917) point out from a study of the subject in twenty-six cases, as well as from a consideration of the theoretical aspects, that it is not the case of cerebrospinal fever which causes the positive contacts, but it is the contacts which produce the case. In other words cases are not carriers before the onset of symptoms and carriers themselves very seldom develop the disease. The case of cerebrospinal fever is the rare individual who is susceptible to infection and he acquires his infection from a healthy, insusceptible carrier.

Proceedings of National and Local Societies

SOUTHERN MEDICAL ASSOCIATION.

*Eleventh Annual Meeting, Held at Memphis, Tenn.,
November 12, 13, 14 and 15, 1917.*

The President, Dr. DUNCAN EVE, of Nashville, Tenn., in the Chair.

SESSION IN PUBLIC HEALTH.

(Continued from page 47.)

Intensive Community Work in Tennessee.—

Dr. E. L. BISHOP, of Nashville, Tenn., stated that health had been said by some one to be the physiological functioning of a community. Class education was of importance in that we hoped to reach the masses through the masses. Of the latter, the family physician was as valuable as, if not more so than, any other factor. No one expected him to be a trained sanitarian, but where postgraduate work was offered him in a practicable way, he would form an important link in our chain of education. He believed it also to be a part of the field man's duty to attend all county medical society meetings during his stay, to secure their endorsement, and to take part actively in each meeting where opportunity offered. He would always be made room for. Special attention should also be paid to any social service organization or club of like nature. We should try to secure organized effort from a community standpoint, and to establish such a sanitary sense that health work would ever afterwards be seen as an affair of community interest, and not through the tubular vision of the individual perspective. Unless this was done, no matter how well the result showed on paper, we would have fallen short in attainment and would have secured but temporary improvement.

Medical Inspection of Schools in North Carolina.—

Dr. GEORGE M. COOPER, of Raleigh, N. C., said that the purpose of medical inspection was twofold. 1. To inculcate a knowledge of hygiene and sanitation in the minds of the children at an impressionable age. That was teaching applied hygiene. 2. To discover the children who had preventable or curable defects, and to have the trouble treated before permanent danger occurred. The problem in a nutshell was to find the defective children and get them treated. Twenty per cent. of all the money expended for education in the United States was wasted, according to the United States Public Health Service and the National Educational Association, because of preventable physical defects of the children. This meant an annual loss of millions of dollars. About one fourth of all the men examined thus far for the National Army under the draft law had been rejected on account of physical defects. Of the rejections, more than one half had been due to conditions easily preventable if treated not later than the early years of school age. These defects included eye, ear, throat, and teeth troubles. For the purpose of aiding in the treatment of all children whose parents were financially unable to procure the service, the State board of health had a fund of \$10,000 a year available matched dollar for dollar by the counties, thus constituting a fund of

\$20,000 a year for this purpose. If every teacher and every medical inspector did his and her full duty in a sympathetic manner, numbers of children would have the benefit of first class dental and specialists' services who would otherwise never get it.

Relative Value of the Public Health Nurse in the Solution of the Tuberculosis Problem.—Dr. W. L. HEIZER, of Frankfort, Ky., stated that the chief advantages of starting a health campaign in a county which had done little before, by employing competent public health nurses were: the natural inclination of a community to spend less money, a false economy, to accomplish a public service; popular appeal to the public by ministrations to the sick; prenatal care in selected cases; a quick appreciation of the value of public health work by reason of its publicity secured as result of appeals for aid to churches, fraternal organization, the city and county government; when a nurse was employed by a county health and welfare league, as was the policy of his commission, or a similar organization with a large county membership, it was a logical and certain means of crystallizing such an awakened public health sentiment to the formation of a permanent county, city or State health department with efficient officers and sufficient equipment and assistance, to make real work permanent, constructive, and effective.

The Normal College as a Factor in Public Health Education in the South.—Dr. U. F. JONES, of Hattiesburg, Miss., asked what could be done to bring about a closer relation between the health department to make the knowledge and practice of public health a part of the every day life of a community, and to conserve the loss in a community due to preventable disease. The school was the agency endowed by every circumstance for the accomplishment of the task. The normal schools were among the few largest factors in the educational scheme of his county. The normal school was not doing justice in training its teachers in health work unless it had a clinic for the diagnosis of such defects as they would constantly find in their own schoolrooms, clinics showing defective teeth, large tonsils, malnutrition, defective vision, etc., physical defects which should be remedied during school life.

Physical Status of Juvenile Delinquents.—Dr. ELIZABETH BASS and Dr. MAUD LOEBER, of New Orleans, La., basing their study upon clinical and physical examinations of children in the reformatories in New Orleans, believed that many of the children who were sent to our reformatories would make better men and women if even superficial attention were given to them before their commitment by a physician attached to the juvenile court, to be followed up in each instance, according to the opinion of the court, either by the child's natural or rightful guardian, or should the court deem commitment proper, by the custodian of the municipal or State institution. Their suggestions, therefore, were: 1, a conscientious routine physical and clinical examination, with recommendations on the case to the

court before commitment; 2, penalty exacted of the natural guardian in cases of neglect to care for the physical defects of the child or children in their care; 3, physical and clinical records kept of each child at the time of admission into reformatory, and observations recorded once each month thereafter, or more frequently should the case require it; 4, each reformatory attending physician to have as assistants specialists in the various branches of medicine and as staff officers, to visit regularly and treat cases needing attention in his specialty; 5, a resident trained nurse; 6, the diet and mode of life in an institution to be passed upon by the institution's attending physician.

Dr. OSCAR DOWLING, of Shreveport, La., said that the prison system in vogue was an insult to intelligence and a disgrace to a civilization which we call Christian, and there was no feature of the whole system more in need of reform than that which pertained to the juvenile criminal. Although not complete, there were sufficient data to show the close and intimate relation of mental states to abnormal physical conditions. That defects or bodily pain were the cause of actions often mistakenly called criminal was clear. Logically, the cause should be discovered and the remedy applied. Every court should take cognizance of pain or mental defect as a predisposing cause of crime. No jury would convict an insane person. Institutional life at its best for the well was not an environment which gave ideal results, and life in an institution for the physically defective, even with the utmost vigilance, could not be other than trying in the extreme. He heartily approved the recommendations contained in the paper, each one of which was important and imperative. He believed they were practicable and could be put into immediate effect wherever public opinion would make the demand. He believed full publicity as to the details of juvenile court proceedings and institutional life would stimulate public sentiment to the degree that the demand would be made.

SECTION IN MEDICINE.

Chemical Analysis of the Blood as an Index to Treatment.—Dr. JAMES S. McLESTER, of Birmingham, Ala., chairman of the section, said that it was frequently asked whether the chemical analysis of the blood, which was of admitted interest in the research laboratory, offered anything of real practical value to the clinic. Unquestionably it did. One needed only to point to nephritis and diabetes. Of still greater importance was the field for clinical research which had thus been opened, and considering the possibility through these methods of solving old problems and gaining insight into new things, he was tempted to say that as yet the surface had hardly been scratched. What of its value to the clinic today? The nonprotein nitrogen of the blood in which was included all nitrogenous waste products, was increased with loss of kidney efficiency. The kidneys determined the height of the waste products in the blood and, conversely, the accumulation of such waste products gave evidence of loss of kidney function. Diet was normally of no influence since independent of protein intake the nonprotein nitrogen maintained a fairly constant

level, but with diseased kidneys the diet became a determining factor and a high nonprotein nitrogen content of the blood could usually be reduced by proper feeding. Estimations of the nonprotein nitrogen alone, however, were of small clinical value, serving chiefly as a basis upon which other values might be reckoned.

Urea formed in health about one half of the nonprotein nitrogen, the upper values of each being approximately fifteen and thirty mgm. respectively, in 100 grams of blood. With the increased nonprotein nitrogen of kidney incompetency, he found a relatively greater increase of urea, so that with fifty mgm. of nonprotein nitrogen, for instance, we were likely to find thirty or thirty-five mgm. of urea. A consideration of these figures, and particularly of the change produced in them by appropriate diet, gave information which was of definite clinical value; but Ambard's coefficient, which was intended to express by mathematical formula the mutual relationship of blood urea and urine urea, was coming to be regarded as an unnecessarily complex piece of reckoning.

Attention had frequently been called to the increase in blood uric acid which accompanied chronic interstitial nephritis, this increase being parallel with that of the other waste products. Recently, Myers and Fine had reported a number of cases of early chronic interstitial nephritis, showing increase of blood uric acid with no corresponding accumulation of urea and creatinin and little or no disturbance of phthalein output. They expressed the opinion that an increase in the blood uric acid alone might frequently be taken as evidence of early renal incompetency, and were inclined to the belief that this test would give positive evidence of chronic kidney disease before the appearance of the classical albumin and casts.

While in early nephritis estimations of the blood sugar and uric acid were of value, at the other end of the clinical process we found creatinin accumulations offering prognostic information of great value and grave significance. In health and even in kidney diseases of moderate degree, creatinin maintained the remarkably constant level of one to two mgm. in 100 c. c. of blood, but when uremia was impending, this substance in rapidly increased values above two mgm. might be looked upon with great concern. Chace particularly had called attention to the prognostic value of creatinin estimations and to their therapeutic application. Joslin stated that in forty-five per cent. of his diabetics an increase in body fat preceded the onset of the disease, and that in sixty per cent. of the fatal cases death was caused by disturbances of fat metabolism resulting in acidosis.

Uniformity in the Wassermann Reaction.—Dr. WILLIAM LITTERER, of Nashville, Tenn., and Dr. CHARLES WATTERSTON, of Birmingham, Ala., presenting the report of the Committee on Uniformity in The Wassermann Reaction, drew the following conclusions: A uniform technic and a uniform antigen in the hands of men trained in laboratory work would give uniform results if adhered to closely in every detail. Before the results obtained with the Wassermann test were

uniform, a method of standardizing the antigen must be found and the men performing the test must agree as to technique.

Syphilis of the Heart and Aorta.—Dr. BRYCE W. FONTAINE, of Memphis, Tenn., stated that the records of the Memphis General Hospital for the years 1916 and 1917, inclusive, showed a total admission of 219 cases of cardiovascular disease, among which were forty-three whites, 176 negroes, 183 males and thirty-six females, between the ages of four and seventy-seven years. Among these patients disease of the cardiac valves headed the list with the occurrence of mitral insufficiency in 133 of the cases, and aortic insufficiency in twenty-four. Next in point of number were aneurysms of the aorta and the peripheral arteries of which there were eighteen. Such a study showed in the cases of mitral disease thirty-seven, or 27.8 per cent. infected with syphilis; in the cases of aortic disease, eleven, or 45.8 per cent.; and in the cases of aneurysm, eleven or 61.1 per cent. From this could be seen how very prominent and common a factor syphilis was in the production of diseases of this character. This fact was suspected more than fifty years ago, and Wagner recorded a very accurate microscopic appearance of syphilitic aortitis as early as 1866. This author recognized a process in the aorta resembling in some respects atheromatous changes, but in many ways it was unlike atheroma. His experience accorded very closely with that of others, particularly Pearce, in that perhaps fifty-five per cent. of his cases of aortic insufficiency in adults under thirty-five years of age showed a positive Wassermann reaction and an absence of all other etiological factors except syphilis in the production of the disease. In every case of aortic insufficiency in a young adult, in addition to the physical and other examinations, a radiographic examination of the chest should be made for this might be the only means of differentiation from chronic aortitis or aneurysm.

Syphilis of the Stomach and Intestines.—Dr. SIDNEY K. SIMON, of New Orleans, La., stated that syphilitic ulcers of the stomach probably represented a breaking down of the gummatous deposits in the mucosa and submucosa. Some authorities believed that the obliterating endarteritis, found as a rule in luetic granuloma, played an important rôle in the causation of ulcers. The ulcers had the appearance of a ragged crater on a hardened, infiltrated base, and, unlike the peptic ulcers, were multiple in their distribution over the gastric surface. Again, in contrast to the peptic ulcers, bleeding was a rare phenomenon in the syphilitic type. Syphilitic involvement of the upper intestinal tract was undoubtedly rare. However, instances of such involvement had been described in the literature. Gutman recorded a case in a woman, aged forty years, presenting a clinical picture somewhat resembling typhoid, with diarrhea, fever, emaciation, etc. On autopsy, the small bowel from the jejunum down showed numerous annular constrictions, corresponding to deep ulcerations on the mucosa. An obliterating endarteritis was present, but no tubercles or giant cells could be detected. Howers saw a case of intestinal syphilis in a man, aged

twenty-three years who gave a distinct luetic history. Clinically, he complained of persistent diarrhea with bloody stools, abdominal pain, and distention aggravated at night. The patient subsequently died of an influenzal pneumonia, and at autopsy circular constrictions were found in the bowel as a result of cicatrized ulcerations.

In the case of the lower bowel, and particularly of the rectum, there could be no doubt of the occurrence of definite syphilitic lesions. It had been his experience that syphilitic ulceration of the rectum was by no means an infrequent manifestation of the disease. Dysenteric symptoms were present, sometimes in an acute form, and a striking analogy was suggested to such well known conditions as amebic or bacillary dysentery, or even to malignant disease of the rectum.

Diagnosis and Treatment of Oral Infections.—Dr. THOMAS P. HINMAN, of Atlanta, Ga., said that ever since the relation of oral infection to systemic disease was discovered, the profession had tried to eradicate the foci in fully functioning teeth without destroying the masticating power by extracting the offending organs, and in some instances these curative means had been successful. However, where there had been a great rarefaction of the cancellous structures supporting the teeth, large foci were present, and the patient was suffering with a severe disease traceable to these foci, then extraction and curettage were imperative. Where there were many foci in the mouth, it was almost impossible to determine which one was the source of the trouble; therefore, it was imperative that all should be eliminated. Where the teeth were infected, the tonsils were very frequently involved, and in examining the mouth, the tonsils should always be included. A simple examination could be made by depressing the tongue with a dental mirror placed well back at its base and pressed against the tonsil at its lower border; then, by drawing the mirror upward, in this manner milking the tonsil, any infection would become apparent, as pus would show on the surface of the mirror. While this was rather a crude method, it was effective. Three means of eradicating apical dental foci were: 1, extraction of teeth and curettage; 2, excision of the root end and curettage; 3, electromedication through the canal.

Oral Sepsis and the Anemias.—Dr. M. L. GRAVES, of Galveston, Texas, stated that anemia constituted but one of the numerous clinical manifestations of sepsis or infection, whether it originated in the mouth or elsewhere. It was a fairly constant symptom in all the grave infections and a less frequent one in the less severe ones. Sufficient was known at present to justify more than a suspicion that William Hunter was correct in believing that pernicious or infective anemia should be laid at the door of mouth infection. His own experience tended to confirm this belief, particularly in two recent cases of pernicious anemia. In one patient rigid examination failed to reveal any focus of infection save the mouth, which showed a bad glossitis and pyorrheal abscesses about all the few remaining teeth. After the administration of 5,200 c. c. of blood by citrate transfusion at intervals, the use of

salvarsan intravenously, the administration of HCl and good food and rest, only very temporary improvement resulted. When all of the infected teeth were removed, the patient made such rapid and marked improvement that he had now resumed a laborious occupation with the appearance of health and a blood exhibit approximating the normal.

Cases of secondary anemia, associated with arthritic disease, had responded but poorly to blood tonics, such as iron; but some of them, and one in particular, in a recent experience had responded rapidly to an autogenous vaccine made from the removed tonsils containing abscesses, and the symptoms had improved in a notable way, while resistant to all other treatments, including antistreptococcic serums and stock vaccines. These experiences had led him to believe that mouth infections were frequently the cause of acute and chronic illnesses with or without anemia, and to insist that every focus of infection be removed in the effort to restore health.

Relation of Chronic Infection to Thyroid Deficiency.—Dr. HARVEY G. BECK, of Baltimore, Md., stated that during the past three years, since he had made it a routine matter to examine all patients suffering with chronic ailments in reference to disturbances of the functions of the glands of internal secretion, he had been impressed in the course of his investigation with two important facts: 1, that glandular insufficiency was of common occurrence and was frequently overlooked; 2, that chronic infections were almost invariably associated with glandular syndromes. These infections were usually focal in character and seemed to occur with the same relative frequency in insufficiency of the thyroid, pituitary, gonads, and adrenals. Rheumatism showed a special tendency to involvement of the thyroid. Vincent had shown the incidents of fifty to eighty per cent. of swelling and tenderness of the gland in the course of acute rheumatic fever. Billings emphasized the frequency with which thyroid intoxication occurred in young women patients with focal infection in the form of alveolar abscesses, tonsillitis, and sinusitis, while Reede had observed thyroid enlargement in fifty children under twelve years of age, coincident with chronic gingivitis. He also cited a case in which goitre symptoms were relieved after removal of two abscessed teeth, and another case in which goitre, arthritis, and pyorrhea followed tonsillectomy, from which the patient recovered after treating the pyorrhea and extracting an abscessed incisor.

Seventy-eight of the 100 patients in his series at the time of examination suffered with chronic infections, mostly focal in character; ninety-four either showed evidence or gave a history of infection antedating the onset of symptoms. In several instances well marked symptoms of thyroid deficiency developed after protracted acute fevers. Symptoms appeared in two cases following typhoid, one malaria, one puerperal infection, and one repeated attacks of rheumatic fever. Oral sepsis and inflammatory diseases of the gallbladder and appendix played an important rôle in the relation of chronic focal disease and hypothyroidism, comprising sixty-three per cent. of the 255 infections present in the series. The remaining thirty-seven per

cent. formed a miscellaneous group and included among others pelvic infection, pyelitis, arthritis, amebic dysentery, anal fistula, syphilis, tuberculosis, etc. Oral sepsis embracing tonsillitis, root abscesses, pyorrhea, sinusitis, etc., represented thirty-six per cent. of the total infections and occurred in fifty-six of the cases. Chronic appendicitis was observed in thirty-two cases, and cholecystitis and cholelithiasis in twenty-four. In several instances symptoms of both appendicitis and cholecystitis existed in the same individual.

(To be continued.)

Book Reviews.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

Malingering or the Simulation of Disease. By A. BASSETT JONES, M.B. (Lond.), Late Temporary Hon. Lieutenant, R.A.M.C., Welsh Hospital, Netley; Late Senior Surgeon, Cardiganshire General Hospital; Deputy Coroner, North Cardiganshire, etc., and LLEWELLYN J. LLEWELLYN, M.B. (Lond.), Senior Physician, Royal Mineral Water Hospital Bath (Attached to Second Southern General Hospital); Physician, Officers' Convalescent Home, Bath; Formerly Medical Officer of Durham County Asylum, etc. With a Chapter on Malingering in Relation to the Eye by W. M. BEAUMONT, Acting Ophthalmic Surgeon to the Bath War Hospital. Philadelphia: P. Blakiston's Son & Co., 1917. Pp. xxii-708. (Price \$7.)

There are two points of view in regard to the subject of malingering, both of which need modification. There is room in both for greater breadth of mind and a firmer basis of fact upon which to consider and to treat the phenomenon. On the one hand there is a tendency, as the authors note, to disregard malingering as either beneath the physician's notice or as after all but a mental manifestation in itself and therefore only a part more or less of any individual makeup and so a mere factor, perhaps a negligible one, in any case that appears. On the other hand it is given too great prominence, either being accredited with far too many real disorders, the true diagnosis and treatment of which are thus overlooked, or psychologically it is so magnified that it loses its setting in the whole sum of psychic complexes which go to determine it. The last is somewhat the authors' attitude, and yet their book is on the right road toward correcting all these partial or exaggerated points of view.

Malingering is a factor that cannot in any degree be ignored in medicine, and particularly when Workman's Insurance is a matter of discussion and experiment in every country and the war is putting men to such a test of reality, medical as well as otherwise, such as never was before. Certainly the subject is not born of these conditions, as some would have the profession believe. The writers are correct in recognizing it as merely a form of an ancient impulse, primitive indeed, which has served its ends since man began. So much the more need is there of understanding its psychological nature, the various modes of its appearance and exercise, and the manner in which the physician may devote careful attention and close examination to those applying to his decision, in order to detect it and deal with it fairly and justly. It is pointed out that the matter involves not only economic justice and the physician's reputation, but even more important the moral standing and the psychological effect upon the patient himself. Therefore the writers have presented in detail and in a direct, practical way all these points of discussion. They have also given much space to specific forms of malingering in relation to various separate diseases, mental and physical, presenting the difficulties involved and means of encountering them. They

must necessarily leave the subject still obscure and difficult, but they have made a helpful beginning and offered some very workable suggestions and guides.

The attitude toward which they invite their readers should be a still broader one. However conscious and intentional the deceit, the fundamental racial and individual reasons for it and its particular mode directed in each instance toward a particular end are subjects for understanding in themselves as evidences of nonadaptation and hence disease manifestations. Moreover, as the enlargement of the conception of disease and of knowledge of definite physical and psychical syndromes has cleared away much false diagnosis of malingering, so there is still far more hope of readjustment on this score. For diagnosis of psychical tendencies and causes for both psychic and somatic manifestations is gaining a clearer outlook through admission of unconscious psychology with its motives and determinants into the field of medicine. This also is touched upon in the book, which is both a fund of definite information and suggestion and a stimulus in this wider sense. It has also a literary and psychological setting which add to its desirability as a library possession.

Everyman's Chemistry. The Chemist's Point of View and His Recent Work Told for the Layman. By ELLWOOD HENDRICK. New York and London: Harper & Brothers, 1917. Pp. 373. (Price \$2.)

A writer who sets out to "wheedle some amusement out of science" at once receives commendation whether his work deserves it or not, for the student is ever ready to be amused and to lighten the acquisition of facts with fun. Here is a book which, keeping its readers in good humor both with the author and with chemistry, presents many other worth while points of value in the presentation of the subject of chemistry as a vital and practical field of interest. First of all is the actual information which the author imparts with charming humility as a chemist and comforting modesty of expectation as regards his reader, from whom he does not expect any pedantry of knowledge or presumption of interest, even, in a subject whose appeal the reader may frankly not yet have learned. The knowledge is provided for in the book itself in a thoroughly practical and interesting form. The interest cannot fail to be stimulated in a subject at once so enlivened by humor, a certain whimsical attitude toward the elements and their properties, of which chemistry treats, "stuff" and the "ways of stuff" which constitute matter and its practical chemical behavior.

One other special point of view is that of the great practicalness of this study. Still another most important one arises from the fact that the writer has been caught by the concept of energy at work, which is evident in his live style of writing. It is felt in all his discussion of the chemical behavior of inorganic and organic substances; it is in the very applicability of all this knowledge to actual economic problems. More than this it goes over into the broad conception that acknowledges the ignorance and allows even for some inaccuracies, which await the light of greater knowledge, while they express the need for a large amount of speculative faith and an open mind before unknown possibilities. The book might be especially recommended to those, physicians perhaps, whose study of chemistry lies dormant in the past. Touch the book and see how growing and vital a thing this science is coming more and more to be, and through it get a new inspiration to receive and utilize that concept of a tremendously busy energy working in many directions and many ways, with one great progression within it.

The Prescription. Therapeutically, Pharmaceutically, Grammatically and Historically Considered. By OTTO A. WALL, Ph. G., M. D., Professor of Materia Medica, Pharmacognosy, and Botany in the St. Louis College of Pharmacy; Member of the Committee for Revision of the Pharmacopoeia of the United States, 1880-1890 and 1890-1900; Second Vice-President of the Convention for the Revision of the United States Pharmacopoeia from 1900-1910, etc. Fourth and Revised Edition. St. Louis: C. V. Mosby Company, 1917. Pp. 274. (Price \$2.50.)

In many respects this is a rather pretentious work and cannot be classed among the textbooks on the subject of prescription writing, although it contains much of the neces-

sary information usually found in such works. It is rather a discussion of the prescription itself from a number of aspects. Thus under the caption General Considerations there are brief presentations of the pharmacy of the several general types of galenical preparations, both official and nonofficial. The subject of weights and measures is treated at some length and there, as in other portions of the book, there is considerable material which is of historical interest only. The chapter on language contains many interesting facts which are of comparatively little importance to the one desiring to learn the art of using the Latin, but aside from these comprises a clear and readily grasped discussion of the essentials of pharmaceutical nomenclature and the grammar of Latin as encountered in the prescription. Many very useful hints in the art of prescribing are to be found in the chapter dealing with the extemporaneous prescription, as well as some matter which could well have been omitted without marring the book. Finally, the work is closed by a most interesting chapter on the history of the prescription from ancient times and an appendix dealing with many medical superstitions related to the treatment of disease. As we said in the beginning, the work is in no sense a textbook, but it should find a place among books of reference on the subject or as collateral reading. The author is to be congratulated, as are his publishers, on the attractiveness of the volume, which is quite in keeping with the place it ought to take in medical literature.

Births, Marriages, and Deaths.

Married.

DEANE-RUSSELL.—In Lawrenceville, Va., on Tuesday, December 25th, Dr. Robert Armistead Deane, of Lawrenceville, and Miss Otelia Virginia Russell.

NIELSEN-STODDARD.—In Greenwich, Conn., on Friday, December 28th, Dr. Le Roy R. Stoddard, of New York, N. Y., and Miss Alice Nielsen.

Died.

ANDERSON.—In Davenport, Ia., on Saturday, December 22d, Dr. Frederick E. Anderson, aged forty-two years.

BALABANOFF.—In Tacoma, Wash., on Monday, December 24th, Dr. Margaret Carsley Balabanoff, aged sixty-six years.

BEVAN.—In Baltimore, Md., on Thursday, December 27th, Dr. Charles Frederick Bevan, aged sixty-seven years.

BRACY.—In Mitchell, S. D., on Wednesday, December 26th, Dr. Edward Bolivar Bracy.

BURDICK.—In Providence, R. I., on Wednesday, December 26th, Dr. Frank E. Burdick, aged forty-six years.

BURNS.—In San Francisco, Cal., on Wednesday, December 26th, Dr. Matilda Burns, aged sixty-four years.

EISENHART.—In Harrisburg, Pa., on Friday, December 28th, Dr. Harry P. Eisenhart, aged fifty-seven years.

HATCH.—In Wellesley, Mass., on Saturday, December 29th, Dr. Royal Hatch, aged thirty-nine years.

HENSLEY.—In Marion, Ohio, on Friday, December 21st, Dr. James L. Hensley, aged eighty-five years.

JONES.—In North Woodlawn, Ala., on Sunday, December 23d, Dr. DeVotie D. Jones, aged seventy-three years.

KINGSBURY.—In Needham, Mass., on Wednesday, December 26th, Dr. Albert D. Kingsbury, aged seventy-five years.

LATHROP.—In Lowell, Mass., on Tuesday, December 25th, Dr. William H. Lathrop, aged seventy-eight years.

LITSINGER.—In Baltimore, Md., on Thursday, December 26th, Dr. Glenn Mitchell Litsinger, aged forty-five years.

LIVINGSTON.—In Jacksonville, Fla., Saturday, December 22d, Dr. John Hartridge Livingston, aged sixty-seven years.

LUTHER.—In Savannah, Ga., on Friday, December 28th, Dr. John W. Luther, of Palmerton, Pa., aged forty-two years.

McKINNON.—In Sidney, N. Y., on Thursday, December 20th, Dr. George A. McKinnon, aged fifty-six years.

McKNIGHT.—In Hartford, Conn., on Tuesday, December 25th, Dr. Everett J. McKnight, aged sixty-two years.

SIMONS.—In Caldwell, Ohio., on Wednesday, December 19th, Dr. Charles P. Simons, aged seventy-five years.

STELLE.—In Cordova, Md., on Wednesday, December 26th, Dr. Clifford Morrough Stelle, aged sixty-four years.

STEVENSON.—In Haddonfield, N. J., on Thursday, December 26th, Dr. John R. Stevenson, aged eighty-three years.

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Original Communications

DUCTLESS GLANDS AND DERMATOLOGY.

By WILLIAM P. CUNNINGHAM, M. D.,

New York,

Attending Dermatologist, Misericordia Hospital; Associate Visiting Dermatologist, Children's Hospital and Schools, Randall's Island.

Fashions come and fashions go, pathological and sartorial. Etiology is replete with innovations, some of which are true, some of which are partly true, and some of which are rubbish. The mind is striving constantly to get nearer to the causes of things, and many plausible conceptions are but incomplete developments of the slowly evolving ratiocination. Explanations that are satisfying at a certain point in our progress are later rejected as wholly inadequate. The receding of our mental horizon brings in new and broader vistas, and our angle of observation alters our relation to the whole. Our forebears were wise and thoughtful men and the theories at which we smile today were, in the range of their perception, logical and true. They fitted the facts in their possession. As other facts were painfully and laboriously acquired, the mind was forced to further travail to find the *raison d'être*, and we drifted away from the humeral and into the microbic concept of disease. Here we felt that we were safely anchored, for were not the causes susceptible of ocular demonstration? We had no further to go, when we had settled, for example, that the pneumococcus produced pneumonia. The whole problem was solved. The trifling circumstance that it did not enable us to prevent or cure pneumonia, was only disappointing to the grumbling clinician. The micropathologist was justly elated, that he had found a sure footing at last and had exploded all the absurdities of his muddled predecessor. Now all we had to do was to prevent these little raiders from gaining access to the circulation and preventive medicine had reached its apogee. Curing disease would have given way to forestalling disease and the millennium of medicine would have been reached in the abolition of medicine.

This ecstatic vision was marred by one little shadow. As it was found impracticable for the average individual in civil life to go about swathed in antiseptic dressings and muzzled with a gas mask, pathogenic microorganisms could not be excluded from the circulation. They got in with disconcerting persistence and raised as much disturbance as before their identification. That apogee began to fade in the mists of departing hope and

the mind resumed the old, old quest for the cause of disease. For it was manifest that the microorganism was only one factor and that some correlative, corresponding, and essential factor had escaped the eagle eye of the chagrined pathologist. If microorganisms could not be kept from attacking—and a majority of the human race were able to make a successful resistance—it was obvious that some quality inappreciable by the microscope determined the issue of the contest. So the search went forward and the importance of the germ was surpassed by the importance of predisposition. Naturally we did not care a straw for all the germs ever discovered if we had the power to repel them. Like the sprites and phantoms of ancient superstition they were helpless against the normal individual. The assault, when successful, revealed a weak defense. This was innate in the victim or induced by extraneous causes such as exhaustion, dissipation, or accident. Vague indeed were our efforts to make the terms agree, by dragging in "defective innervation," "defective metabolism," "anemia," and the other catch phrases by which we covered up our utter lack of definite information. We were reeling around in vertiginous imbecility, blindly stabbing the empty air in the hope of making our microbes stick and little better off in the matter of a rational pathology than our "humorous" ancestors.

In the midst of this disheartening failure came the light of a great revelation, making clear the darkest places and forecasting brilliant conquests. Myxedema and the thyroid told the tale of endocrinology. A science was born that had to do directly with the forces governing the processes of growth, reproduction, and cerebration, whose normal activity built up the body and conserved it, organized disease defenses, held the key to the emotions, fed the flame of intellection, kept the poise of perfect function. In the various chronic departures from normal conditions could be detected the etiological participation of one or more of the ductless glands. The state of cretinism, of infantilism, of myxedema is a classical illustration of thyroid insufficiency. The state denoted by the term exophthalmic goitre is a classical illustration of thyroid hypersufficiency. Between these two marked extremes are many gradations of perverted nutrition. We may cite the backward child; the undersized and pasty child; the dull and constipated child; the anemic, coarse haired, lustreless child; the youth of immature proportions; the scrawny and

juny young girl with defective menstruation; young and old lymphatic cases with a low grade adenitis; neurasthenia, melancholia, and a swarm of mild psychoses.

The complicity of the pituitary in the retardation of growth on the one hand and its eccentric accentuation on the other, emphasizes the contention that all of the glands of internal secretion operate interdependently, either supplementing directly their various activities or stimulating them by impulses communicated through their hormones. It seems impossible at this time to isolate influences peculiar to any one of these powerful agencies and exerted without regard to or modification by the others. They constitute a system of physical forces, a chain of power houses as it were, all working to the same end, all producing a particular output necessary to the maintenance of the organism and of one another. If you administer thyroid you stimulate the adrenals; if you administer adrenin you stimulate the pituitary; in short the increased activity of any one of the chain of glands induces a like activity in all the rest. They are all on guard over our vital processes, and an alarm at any point brings out their entire force. Physiological shrinkage of the thyroid occurs during the amenorrhea incidental to pregnancy. The administration of pituitary accelerates the expulsion of the uterine contents, undoubtedly at the same time speeding up the thyroid and terminating the period of amenorrhea. Blood flows, the uterus contracts, and a baby is born.

In cases of dysmenorrhea or amenorrhea associated with neurasthenia, the exhibition of the corpus luteum combined with thyroid is decidedly efficacious. The development of the corpus luteum is contemporary with the establishment of the menstrual flow, and the thyroid is synergistic in this regard as we have already seen. It is maintained that the thyroid reacts upon the ovary and augments the influence of the corpus luteum. By restoring the normal "hormone balance" the demoralizing nervous phenomena are brought under control. In the production of this delicate "hormone balance" the mamma is pitted against the ovary. The former, which enlarges and functions abundantly during the amenorrhea of pregnancy and lactation, antagonizes the action of the ovary in cases of uterine hemorrhage. In this it is assisted by the well recognized hemostatic action of the adrenals. The late Brown-Séquard aroused considerable excitement and brought down upon his devoted head a torrent of acrimonious criticism because he ventured to claim for testicular extract properties analogous to those conceded to the ovarian. A man of mighty intellect and enviable achievements, firmly grounded in the physiology that inspired his declarations, he found himself denounced, reproached, and ridiculed for venturing the publication of a principle too far ahead of the thought of his day. Scientists poo-pooed him. Sensitive moralists shunned him. The public laughed at him. He gradually became the butt of vulgar witticisms. And all the time he was right and his assailants were blatant fools who could not grasp the possibilities of the proposition that he enun-

ated. Thyroid has shown results of a similar nature partly because of the participation of the sexual system in the general wellbeing, and partly because of the stimulation of the tests by the hormone of the thyroid. "Homostimulation" is the term applied to the arousing of glandular activity by this indirect method. We have seen that some glands antagonize others and some assist. Their combined secretions constitute the "hormone" balance nicely adjusted by Nature to maintain, conserve, protect, and restore the vital processes. If this balance is lost we are sick or open to the incursions of lurking bacteria. If it is regained we cast out the destructive intruders, metabolism proceeds in orderly and fruitful fashion, our various functions are performed smoothly and efficiently, and we experience the contentment of good health. Herein lies the key to pathology and consequently to rational therapeutics. Endocrinology has left bacteriology as far in the rear as bacteriology left the humeral etiology. We have advanced beyond the classification of exciting causes to the consideration of predisposing causes. The detection of the microscopic inciter to disease is much less important than the detection of the weakness of which it takes advantage. This field of investigation is full of tremendous possibilities. We are only entering upon it and have barely scratched its surface. And yet we are amazed at the discoveries that have rewarded our feeble and unorganized efforts. When the proper energy and system are devoted to its exploration we shall find ourselves capable of achievements surpassing our fondest dreams.

The imperfect exposition of endocrinology with which we have opened this paper aims to clear the way for a study of its dermatological relations. Unless some idea of its essential qualities and its applicability to general medicine is fixed in the mind, it will be impossible to understand its bearing upon any of the special subjects. But given a reasonably clear conception of the principle underlying the doctrine, its operation in definite and restricted fields may be readily followed. It is in accord with the best accredited opinion that the most skillful specialist is the man with the widest knowledge of general medicine. It distinguishes him from the tinker who has attained a certain amount of manual dexterity in making repairs but who is incapable of the broader constructive efforts of the master workman. The laryngologist for example who ruthlessly and invariably sweeps away tonsils, irrespective of their innocuousness under exceptional circumstances, may be frustrating Nature's attempt to compensate for a defective thyroid. The surgeon who would operate on every goitre without a deliberate survey of the patient's entire system might prove to be just as unwise a meddler. Indiscriminate assault upon the ovaries under any plausible pretext has yielded to the sober restraint inspired by calamitous consequences. The ovaries have not only to do with the production of ova; they possess a function through their internal secretion that can not be airily waved aside. So in dermatology the man who will realize that the skin is a part of the coordinated organism, responsive to the disturbances of its other elements, will approach the prob-

lem of therapeutics with a better prospect of substantial results than the one who confines his ministrations to the application of more or less objectionable salves and more or less mischievous rays. This is not a denunciation of local treatment which is a valuable adjuvant of internal treatment, and is indeed under some circumstances the only thing demanded, but it is an appeal for the recognition of the broad general principles which are grounded in the correlation of function.

Myxedema has been mentioned as one of the consequences of hypothyroidism. It is well known, readily recognized, and always attributed to its proper cause. It is a phase of the nutritional vice observed in cretinism. There is no doubt whatever of the connection between this repulsive alteration of the skin and a defective ductless gland. It is one of the commonplaces of pathology. Yet the many perfectly obvious deductions to be drawn from it have been largely overlooked by teachers of dermatology. It was clear as noonday that a disordered ductless gland was capable of producing a grave cutaneous disturbance. But it did not occur to us that milder cutaneous disturbances might be attributable to less complete involvement of the gland. We have permitted an indication of the plainest character to escape pursuit. We have strayed off the main line in many directions and have become entangled in a maze of uncertainty and doubt. Lesions that are not actually neoplasms are usually of a circulatory origin. Circulatory is practically synonymous with nutritional, for changes in the speed and the force of the circulation induce changes in the nutrition of affected areas, and the ductless glands admittedly have to do with the conservation of nutrition. Thus congestive and inflammatory changes get us back squarely to the ductless gland.

Hypertrophy, even where the circulatory element is not demonstrable, as in scleroderma with its increase of the collagen bundles, is undeniably a nutritional abnormality. Atrophy, the end condition in this and other dermatoses, is manifestly of the same character. Acrodermatitis chronica atrophicans is a case in point. As its name implies, it is a chronic disease of the extremities characterized by atrophy of the skin. Its name does not imply that it is usually confined to the upper extremities, but that is a fact nevertheless. There is a preliminary soft infiltration of the skin of a purplish red tint. This infiltration may be nodular at first, the nodules gradually shelving off into the normal skin. After a long period extending over many months, and in some instances over many years, the infiltrations give way to the atrophic sequel that is the salient feature of the disease and the significant feature of the title. Under the name of diffuse idiopathic atrophy of the skin the lower limbs are found involved as well as the upper in a pathological process identical in its consequences with the preceding. The stage of initial edema or appreciable inflammation may be lacking. The thinning of the skin may be the first noticeable alteration. There is little doubt that the two conditions are but variants of each other, and so like to scleroderma as to create the impression that they are of common origin. If we seek for light on the etiology we are

faced in the books by the tiresome rejoinder "Cause unknown" or "trophoneurosis" or some other banality. Syphilis sometimes produces a similar degeneration of the skin. If three diseases bring about the same results it is a fair presumption that they are operating through the implication of some organ possessed of the power of thus modifying nutrition. That is more reasonable than the proposition that the three diseases themselves are each capable of this distinctive achievement. As the thyroid is conceded to exercise such a control of nutrition as is manifest in the cause and cure of myxedema, what more plausible than the suggestion that in all of those marked degenerative changes, of varied nomenclature but identical structure, the gland is the original point of attack, and the conspicuous manifestations are secondary to its disordered function?

Bearing upon the correctness of this deduction is the reported success of the action of pituitary in the treatment of morphea. This designation serves to distinguish a variety of scleroderma appearing in rather limited patches usually of circinate outline. Now pituitary is not thyroid and it would appear to be beside the subject to mention its therapeutic application to conditions attributed to the thyroid, but if we will recall the hormone balance mentioned above and the principle of homostimulation we shall see that the stimulation of pituitary activity will stimulate thyroid activity and thus set in motion the very influence we desire to obtain. The adjustment of dosage of these organic extracts is still a matter of experiment, and failure to effect amelioration or cure may be due to faulty estimates. Experience will show whether we have been timid or reckless. This is as favorable an opportunity as another to dispose of the reproach of empiricism cast upon organotherapy by super-sensitive scientists. "Empirical" is derived from the Greek *empireikos* meaning "experienced." Experience and experiment are from the Latin *experior* meaning "to try, to prove, to put to the test." An empiric is a person who experiments and draws conclusions from his experience. That gives an accurate description of the process of induction, the only method recognized by exact science in the formation of rational opinions. The withering charge of empiricism is thus unwittingly the highest compliment paid by ignorance to wisdom. Observation brings experience. Experience is empiricism. Induction is based on experience. Induction is empiricism. So experience will bring us wiser decisions in the size of our doses and doubtless it will be found that very often "vaulting ambition has o'erleaped itself" or timidity restrained the hand of genius. Dr. Joseph E. Winters confided to me once that he believed that much of the disappointment in treating cardiac disease lay in our dread of administering effective doses of digitalis. We gave amounts insufficient to arouse the energy of the staggering heart, and then attributed the steady deterioration to the cumulative effect of the drug.

There is a disease of the skin whose common occurrence, inconstant treatment, and persistent buffeting in the literature has gained for it the name of "hackneyed acne." We all know what an obstinate, obdurate, recalcitrant, refractory, and re-

lapsing devil it is to exorcise. Diet, hygiene, exercise, vaccines, cold applications, hot applications, massage, lotio alba—one, two, four, and six ply—rhubarb and soda, iron and arsenic, “menstrual regulators” all have been employed with varying degrees of ill success. Now by the grace of a new dispensation, the Kromayer white light is loudly credited with well nigh miraculous effacement of the lesions by the happy possessors of this imposing piece of office equipment. We have grown wary through prolonged discouragement. We have no doubt whatever of the honesty of the testimony offered especially by the makers of the apparatus, but the burnt child dreads the fire and the “burnt” doctor shies at the Kromayer. This is no especial indictment of that particular method of radiotherapy. Unquestionably it has its place. So has radium. So has x ray. So has fulguration. But the ascription of Pooh Bah pluripotency to any such spectacular agent arouses scepticism and distrust. There is no question whatever that the cause of acne lies within and not upon the skin. The nearest approach to a scientific assault upon acne hitherto devised has been the vaccine. This has occasionally given some substantial results. Based upon the principle of getting up the patient's resistance to the particular germs discovered in the lesions, it aimed at developing antibodies. When it succeeded it routed the acne. Failures are distressingly frequent. Why? Presumably because the antibodies are not developed in sufficient numbers to meet the emergency. Then we hear much of opsonins and anaphylactins, and turn away from the discussion convinced that we have had our hand on part of the truth but that the rest of it has eluded us. The fact is that the internal secretory apparatus has been at fault. The opsonic index has not risen to the stimulus employed because the nutrition of the patient has been too low.

Many of these cases are victims of minor thyroid deficiency. Metabolism is abnormal. Resistance to infection is lowered. Many a time the giving of thyroid extract has wrought amazing changes in these anemic, undersized, and disfigured defectives. Animation has succeeded to apathy, color to palor, vigor to lassitude, rondeur to angularity, and the repulsive pimples have melted away in the onrush of mounting health. Sabouraud has insisted that acne is secondary to seborrhea and due to his microbacillus. Perhaps, but his microbacillus would never take hold on a normal skin, kept at the proper pitch of healthful resistance by the flow of the internal secretions. Undeniably there is another aspect of acne which does not depend on hypothyroidism. The acne of the fleshy, ruddy subject obviously the victim of the unwise indulgence of gluttonous appetites is to be treated along the lines of rational restraint. Internal secretions will not counteract persistent and massive overcharging of the system with toxic products of disordered metabolism. Such a case responds very promptly to the restoration of the reign of reason, comprising the enforcement of a judicious abstinence. Brittle nails would seem to be a very trivial affliction. Yet they constitute a constant serious annoyance and an occasional source of disabling infection, for they will

split at times so far in as to leave exposed an absorbing surface. They have been attributed to rheumatism and gout. It is a curious circumstance that this rheumatism rarely shows itself in any other way. The frank rheumatic with swollen joints does not appear to be troubled with this complication. It is the supposititious dyscrasia prolific of vague pains and indeterminate disabilities that is popularly answerable for this unguo friability. We assert that a certain sort of conjunctivitis is rheumatic; that a certain sort of pharyngitis is rheumatic; that a certain sort of cutaneous lesion is rheumatic; that a whole host of minor and unattached disorders have the same etiological association. We did maintain once upon a time that pyorrhea was rheumatic but now we are maintaining that rheumatism is pyorrheal. In all this discussion we have lost sight of a good old word of deep significance and wide application which has been relegated to the limbo of discarded, discredited, and unfashionable doctrines. This word is “lithiasis.” It meant, as many of us remember, a condition of perverted nutrition favoring the production of stone. The perversion was imputed to the liver. Under it was collected a group of symptoms, dispersed in our superior wisdom throughout a specialized pathology, and running the scale from an ordinary sick headache to an attack of hepatic or renal colic. It included lumbago, neuralgia, dullness, lassitude, constipation, dyspepsia, flatulence, foul tongue, ardor urinæ, palpitation, chills, fishy eyes, pasty muddy skin, eczema, acne urticaria, and brittle nails. A most convenient and expressive word. Most of these symptoms are now attributed to intestinal toxemia. Some are attributed to rheumatism. Where there is an intestinal obstruction, where the constipation is mechanical, the connection with the former is undeniable. Where the constipation is purely lethargic and copiously responsive to cathartics, we must assume another cause. The whole picture bears a suspicious resemblance to hypothyroidism. The control of nutrition through the control of metabolism, being fixed in the internal secretory system, such a departure should rationally hark back to a functional inadequacy of that system. The symptoms attributed to rheumatism really form no exception, as rheumatism itself is a disturbance of metabolism. So the old, clinical diagnosis of “lithemia” is metamorphosed into that of hypothyroidism, the libellous aspersions removed from the innocent liver, and the patient, brittle nails and all, is properly classified and treated.

Lithemia has departed but eczema is still with us, and eczema is as fairly entitled to retirement as lithemia. It has served the purpose of a popular misnomer long enough. It has posed in the light of a distinct entity since the dawn of dermatology and with the accent heavy on the second syllable, has epitomized the education of the general public in this subdivision of medicine. This perennial imposter may have served a useful turn during its early career, but investigations into its pretensions have left it nothing but the shell of its importance. One disease after another has been pried from its greedy grasp and passed over into other classifica-

tions until now it stands forth in its naked effrontery as a pure and simple dermatitis. Viewed in this light it is seen to be the result of irritation—always. The irritation may be from without, as by dyes, water, antiseptics, or from within, as by the products of faulty metabolism. There is a co-operation between these two etiological factors. Some skins will endure a great amount of external violence without yielding an inflammatory reaction. Others are damaged very speedily. Others again require no external accessory but burst forth viciously under the excitation of the internal irritant. The logic of this is that the external agencies are pathologically effective only in conjunction with the internal. If the bodily functions are running smoothly and vigorously, the skin will be endowed with the requisite resistance to external ill usage. There is something out of gear in the working of the vital processes when a patient has eczema. The thyroid, being the controller of nitrogenous metabolism, is answerable for this disturbance. Regulation of the diet in the direction of reduction partially corrects the abnormal condition by giving the deficient thyroid secretion less to do. Feeding of thyroid would enable the patient to keep his energy at the higher point of efficiency by taking in safely a larger amount of fuel.

The adrenals are the most susceptible of all the endocrine glands to the influence of infection. Urticaria is ascribed to intestinal toxemia. Sudden paralysis of the bloodvessels in restricted areas but of wide dispersion characterizes the lesions of this maddening affliction. Such a paralysis is due to the failure of the inhibitory action of the adrenals. The circumscribed edema is due to the acidosis following every interference with the circulation and the proper oxygenation of the parts. The administration of adrenalin relieves urticaria. Here there is no question whatever of the etiological and therapeutic influence of an internal secretion upon a dermatological affection. This applies with equal pertinence to erythema multiforme and a *fortiori* to angioneurotic edema.

We have all encountered Addison's disease. The suprarenal capsules are demonstrably at fault. There is a deep pigmentation of the skin. The sequence of cause and effect is indisputable. In the circumscribed pigmentations, such as cloasma, why turn off the main line of pursuit to compromise the liver or the ovary? The discoloration points straight in one direction. To be sure any disturbance of the hormone balance between the various internal secretions may by reflex action excite abnormal action anywhere in the chain. We have noted that certain glands are synergistic and certain antagonistic. All are susceptible of impressions from the others. In this way it must be conceded that the ovary might, by indirection, stir up the adrenal and bring about the alteration in the skin. But the adrenal would nevertheless be the agent immediately producing this result. One might object that here was a great to do about the difference between Tweedle Dum and Tweedle Dee, but in an inquiry into the cause of disease, it is essential to be precise even in apparent unessentials. In our attention to the ovary, let us bear in mind that the

adrenal has been pathologically affected, precursory to the tinging of the skin.

In Graves's disease there is often a discoloration resembling that of Addison's. The principle of the interaction of the internal secretions, herein designated as homostimulation, clearly accounts for this. The adrenals are affected by the disturbance of the thyroid, and express their resentment in the usual lowering way. Depigmentation may blanch the skin either as a congenital or an acquired anomaly. The former is seen in albinism; the latter in leucoderma. The influence that may interfere to the augmentation of pigment may doubtless interfere to the diminution of pigment. The flushing and paling of the cheek are affected by the same stream of blood. The variegated tinting of a contusion, red, purple, yellow, green, or black, is referable to the extravasation of the blood. The subsequent effacement of the discoloration is due to the removal of the abnormally situated blood by the restoration of the circulation. Here we have many startling cutaneous alterations produced and removed by the same agency. Is it any more contradictory to predicate of the adrenals the rather simpler task of bronzing and bleaching the skin? Canities or grayness of the hair is similar to leucoderma in all essential qualities. Hair is simply an appendage of the skin, and its color depends on the same influence that controls that of the skin. It has been credibly reported that the hair has turned white overnight in consequence of some sudden terror or grief. When we consider that the adrenals are gravely affected by those very emotions and induce the reactions which we denominate shock, it is conceivable that their disordered state may have another characteristic effect in decolorizing the hair.

Alopecia areata has proved an irritating impasse to those in search of a rational etiology. It is a mystery worse befogged by the ingenious efforts to expound it. Of course it is acclaimed a trophoneurosis; everybody resorts to that. But the instigation of the neurosis—aye! there's the rub! A large cult ascribes it to cystrain, and if once in a while the victim of alopecia areata should reveal this amazingly rare defect of vision, the whole discussion is regarded as settled. Others would have it toxic; others microbic. Pyorrhea has not escaped the net of the wily etiologist. Note the pallor of the skin from which the hair has fallen. Does it not suggest a leucoderma? Does not the defective thyroid among other dystrophies debase the hair? Does not this combination of falling hair and whitened skin bring up the picture of disturbed internal secretion of the two most conspicuous offenders in the chain?

Hypertrichosis, the antithesis of alopecia, might very reasonably be the result of a reversal of endocrine activity just as hyperthyroidism produces high tension and irritability and hypothyroidism dullness and indifference. The hormone balance is lost in both instances, but different stimuli are liberated and work to opposite conclusions. The cachectic hue of the chronic constitutional disease is undoubtedly ascribable to the implication of the endocrine glands. It has been noted that the adrenals are ready victims to infections of all sorts. The waxy aspect of

the tuberculous or septic patient is not merely a manifestation of anemia. Patients may be pale without being waxy. The operation of another factor besides depletion is necessary to account not so much for the absence of color as for the substitution of another color. The earthy facies of visceral cancer invites the same commentary. The greenish yellow pallor of chlorosis is something more than the absence of a healthy glow. It is a chromatosis. The response to thyroid therapy in many cases of obstinate anemia is disputed but demonstrable. The imputation of deranged adrenals in the chlorotic form supplies an additional reason for the exhibition of thyroid on the frequently mentioned principle of homostimulation. Freckling is usually a trivial condition negligible in the male until old age and camouflaged in the female by the artistic touch at which she is so adept. It is truly imputed to the sun when it is on exposed localities. When it occurs under the clothing how may it be accounted for? When it occurs, for example, on the abdomen of an elderly person suffering with visceral cancer, what is the explanation? When it occurs as the preliminary stage of xeroderma pigmentosum, which eventuates in cutaneous cancer, and is peculiar to the young who have not necessarily had an undue amount of exposure to the sun, what may be the agency at work? Here is food for serious thought, and in the process the adrenals should receive consideration.

The cause of psoriasis has eluded the persistent quest of tireless investigators. The one opinion today that is supported by substantial therapeutic results is that of the metabolic origin of the disease. It is maintained that the ingestion of animal nitrogen precipitates the attacks and prevents recession. Diet regulated on this hypothesis does appear to modify materially the progress of the disfiguring eruption. We have seen that the thyroid has marked influence on nitrogenous metabolism. Its applicability therefore to the treatment of psoriasis would seem to be perfectly logical. Experience has been rather indecisive. The frequent and unaccountable vagaries of psoriasis, which disappears without reason and as inexplicably returns, preclude the attaching of too much importance to any reported successes. Accumulated evidence will be necessary to establish their genuineness. Nevertheless, it is to the thyroid that the empiricist—experimenter—clinician, should turn for the most promising lead in this etiological hunt. Erythema pernio, or chilblains, is so clearly a circulatory derangement that the involvement of the adrenals is certain. This may be due to toxemia to which, as we have seen, the adrenals are particularly liable. It may be due to thyroid insufficiency reacting upon the adrenals. Let us constantly bear in mind that the whole system of internal secretions is attuned to the key that "the injury of one is the concern of all." Raynaud's disease, a gradual obliteration of the peripheral circulation with a shrinking and shrivelling of the fingers and toes, would fairly come under the designation of chronic pernio. Local syncope alternating with local asphyxia, is common to both. "Vasomotor disturbance" is the lucid explanation given of these antipodal variations. But "vasomotor

disturbance," despite its pomposity, means nothing except loss of control of the nerves determining the caliber of the bloodvessels. As to causation it is utterly noncommittal. It is on a par with the explanation given by the little country boy as to why the church bell was tolling: "Because the sexton is pulling the rope!" The vessels are dilated or contracted because the nerves have lost their grip. But what has made them lose their grip? We who have come under the influence of the hormonal theory are convinced that upset adrenals are to blame, whether on account of disease directly invading their structure or on account of reflex perversion of their function, by a disturbing message from the thyroid. Thyroid therapy has proved efficacious in the management of this disease.

Our endeavor to bring into etiological relation the skin and the glands of internal secretion is more in the nature of a stimulus to thought than a demonstration of established facts. The soil is almost a virgin one. It has been worked only in a desultory way. It has yielded poor results in many instances but the promise of better things is there and it needs only intelligent industry to bring them forth. There is a host of cutaneous diseases of whose origin we have no knowledge. In our search we push along blindly in various directions but bring up baffled at "No thoroughfare." The microscopist and serologist afford us little comfort. We are asked to be content with the unconvincing word pathology that begins and ends in phrases. "Trophoneurosis," "vasomotor instability," "toxemia"—unclassified. "neurasthenia," "deranged metabolism"—unclassified: all this is merely whistling down the wind unless supported by definite, precise, and invasive qualifications. For this concatenation of sounds we beg to substitute a real unquestionable and manifest pathological deviation, which stands in causative attitude to many recognized conditions and needs only patient, persistent, and systematic study to establish its connection with a great many others. The internal secretions dominate the vital functions. Distressing, disabling, and even fatal consequences follow in the general economy interference with their normal operations. Is it a far cry from this to the inclusion within the scope of their perverted activities of the many mysterious maladies that assail the skin? The greater includes the less. The envelope of the body cannot escape the deterioration of the whole. In endocrinology will be found the touchstone of dermatology.

616 MADISON AVENUE.

Significance of Lambia Intestinalis in Stool Examinations.—A. H. Logan and A. H. Sanford (*Journal of Laboratory and Clinical Medicine* 1917). In examining the stools of 6,000 patients in the Mayo Clinic the authors found lambia in a little more than one per cent. of the cases. In spite of the fact that many writers consider these parasites nonpathogenic their presence in many instances seems to account for the symptoms associated with this infection. It was found that their removal is difficult, but that the best results have been procured by the use of thymol.

SOME FEATURES OF CEREBROSPINAL MENINGITIS IN CHILDREN.

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That cerebrospinal meningitis is now present in Philadelphia in epidemic form is evidenced by the fact that during the entire year of 1916, there occurred in the city but sixty-nine reported cases of the disease, as contrasted with about 200 reported cases during the first three and a half months of 1917. We have had under close observation thirty-three children and babies suffering from cerebrospinal meningitis, in the wards of the Children's Hospital on the services of Dr. J. P. Crozer Griffith and Dr. Alfred Hand, Jr. We are deeply indebted to Doctor Griffith and Doctor Hand for the privilege of using certain facts obtained from the study of these patients.

Since the first distinctly recognized epidemic in this country over one hundred years ago, the disease has been epidemic about every ten years, and more or less prevalent for the following three years. Thus, while a certain number of sporadic cases are to be looked for in a city the size of Philadelphia every year, more of these so called sporadic cases will probably occur in the next two or three years. Therefore it seems justifiable at this time to consider certain phases of the diagnosis and treatment of what may be defined as a prevalent, serious, curable, and yet frequently undiagnosed condition. It might perhaps be nearer the truth to say instead of "frequently undiagnosed," a condition diagnosed comparatively late in its course. This latter consideration becomes of first importance when we realize that the efficacy of the specific treatment depends to such great extent upon the promptness of its administration. Reserving for later discussion the examination of the spinal fluid, let us determine the symptoms and physical signs which should influence us to perform the diagnostic lumbar puncture. If the symptom complex was always complete, diagnosis would be comparatively easy. Unfortunately, a typical onset is not always definite and symptoms suggestive of meningeal irritation are not in sufficient evidence to be striking. Furthermore, and this point needs such emphasis that it will be dilated upon later, many of the symptoms are often absent, and certain others are not of diagnostic importance in infants. This is worthy of consideration when we know that about fifty per cent. of patients suffering from meningococcus meningitis are under five years of age and twenty per cent. under one year of age. All but one of the children we have observed this year were four years of age or younger and almost one half were under one year of age.

Any acute infection in children may begin with the same train of symptoms which are due, in part at least, to the imperfectly developed and therefore unstable and more easily influenced nervous system of the child as compared to the adult. This group of symptoms includes hyperpyrexia, vomiting, headache, convulsions, and mental disturbance as evi-

denced by drowsiness or delirium. Headache and convulsions are the two of this syndrome that might be expected to predominate in a disease that involves primarily the brain and spinal cord. Indeed, this is the case and in most epidemics these symptoms are among the initial ones. Convulsions occurred in about thirty per cent. of Holt's cases. However, epidemics of disease must vary not only in severity, but also in combinations of symptoms. We are concerned at this time with the diagnosis of cases seen during the present season. Only four, or twelve per cent., of the children we have seen during the past three months have had convulsions at the onset, and strange to say, in only three did convulsions develop later. Of these three, two showed nothing more than muscular twitchings confined to the face or one side of the body.

A careful study of the case histories of patients admitted to the Children's Hospital this year shows that the early symptoms were present in the following order: fever, vomiting, drowsiness, convulsions, rigidity of the neck, headache, chill, tremor, and irritability. The frequent combination of fever and vomiting was notable. The temperature must have been elevated to a considerable degree in order to have been so universally appreciated by the person giving the history. Emesis was severe, was frequently repeated, was not usually accompanied by diarrhea, and occurred in almost all of the children as one of the earlier symptoms. Headache is to be determined in young children by rocking of the head from side to side, or by "head boring." The so called meningeal cry was noted in three children.

The first examination reveals certain suggestive points to the careful observer. Two of the physical findings, hyperesthesia and rigidity of the neck, have already been called to his attention if the child has an intelligent mother or caretaker. Even as early as a few hours after the onset other signs of cerebrospinal irritation, such as a positive Kernig's sign or inability to extend the leg on the thigh when the latter is flexed on the abdomen, and Babinski's phenomenon are frequently present in normal babies under eighteen months. It might be well to say a few words about the Babinski reflex, inasmuch as it is considered by neurologists as nearly a pathognomonic sign as we have of irritation or actual destruction of the motor fibres. A positive response is indicated by a slow upward movement of the great toe upon careful selection and minimal stimulation of the sole. Stimulation should be selective because it is best performed by a stroking motion from behind forward at the junction of the outer and middle third of the sole, and minimal because it should be the least force necessary to cause response. Ankle clonus also may frequently be elicited in babies, although it certainly has pathological significance if persistent. The explanation of ankle clonus and Babinski's reflex in normal babies probably lies in the incomplete development of their pyramidal tracts.

A *tâche cerebrale*, to be of value even as a concomitant physical finding, should be distinct and broad stroking of the abdomen in almost any baby will develop what might be called a mild or moderate *tâche*. Involuntary rigidity of the neck is, how-

ever, certainly not a normal finding in a child of any age, and is present in most cases of cerebrospinal meningitis during the early stage. In three children of our series there was no rigidity. They were young babies, aged respectively six weeks, eight weeks, and nine weeks, and when seen were extremely prostrated by the infection. Two of them died. Brudzinski's sign or flexion of the legs when the head is drawn forward on the firmly held chest is another interesting and helpful phenomenon which is usually present coincidentally with rigidity of the neck. In a baby with an open fontanelles, tenderness and bulging are reliable but not invariable signs. Hyperesthesia is almost always present. The pupils in our patients almost all reacted to light. Variation in the knee jerk is uncertain; it may be normal or diminished, but is usually increased. Herpetic eruptions are common in older children. They occurred in eight per cent. of our thirty-three children. Blood cultures taken early have shown meningococci in the blood stream. The leucocytes rise early in the disease and according to most observers, vary from 25,000 to 40,000. Our observations have shown a leucocyte count on admission to the hospital, averaging 18,000, with a variation of from 7,000 to 33,000. A low leucocyte count is of bad prognostic significance. Blindness, strabismus, nystagmus, deafness, hemorrhagic skin changes, emaciation, and opisthotonus occur later in the course of untreated cases or in those not responding favorably to specific therapy. Petechiae were present in only two of our cases. Serum rash developed in six others. The temperature is not characteristic. The pulse is usually rapid.

There is great difference in the severity of the infection. Severe fulminating cases occur at the beginning and at the height of the epidemic. Some patients die in such a few hours that they show few symptoms except headache and then coma. In others the infection may be so mild as to show diagnostic features observable only on close inspection. It should be emphasized that in babies especially the diagnosis is often difficult. We have seen three infants under one year of age in whom the spinal fluid showed meningococci, whose only deviation from the normal consisted in a tense, bulging fontanelle, fever, and mental apathy.

To recapitulate then: The child on whom we are justified in performing lumbar puncture will present a certain picture consisting in abrupt onset; fever; almost certainly vomiting and rigidity of the neck and hyperesthesia; mental apathy or irritability; perhaps convulsions or a chill and usually, if a baby, increased tension of the fontanelle. Additional symptoms should of course be looked for, but not waited for. Lumbar puncture especially during an epidemic may be indicated with less evidence than the symptoms given above. This is especially true if the puncture can be done under strict aseptic precautions and with close observation of the effect of withdrawal of fluid, realizing that it is a procedure not devoid of danger. "When in doubt, puncture" is an axiom which suggests itself when we consider the frequency of the occurrence of cases with extreme mildness of the symptoms present and absence of other well defined symptoms.

When the needle has been successfully inserted, cloudy fluid under increased pressure will be withdrawn. The turbidity will vary from a faint opalescence to a thick yellow opacity resembling almost pure pus. The pressure will be greater than the normal twenty drops a minute and may flow from the needle in a decided stream. The very thick fluids run with difficulty, however, and it may be necessary to use suction or to inject salt solution and lavage the canal. The amount withdrawn depends on the pressure and should usually be about twenty c. c. The first fluid is to be very carefully studied as the meningococci may not be found after the first serum injection given at this time. Its chief characteristics are that it does not reduce Fehling's solution; contains albumin and globulin; has a cell count decidedly increased over the normal ten to the cubic millimetre; and contains Gram negative, intracellular and extracellular biscuit shaped diplococci. The demonstration of these organisms by smear or culture is the definite diagnostic *sine qua non*. Meningitis caused by the streptococcus, pneumococcus, influenza bacillus, or other pus forming organism will give the same type of fluid. Fluid from the spinal canal of tuberculous meningitis or anterior poliomyelitis may be distinguished by other differences such as less cloudiness, a reduction of Fehling's solution, a smaller amount of globulin, and a decidedly lower cell count.

Having made the diagnosis, the question of proper treatment arises. While certain problems are associated with the manner of administration of Flexner's antimeningococcic serum we believe that the main fact remains undisputed, namely, that the serum should be used in every case of meningitis caused by the meningococcus. While lumbar puncture, by draining off the contained pus and organisms, has a theoretic value, it is seldom curative in itself. Lavage of the canal with normal salt solution accomplishes the same removal of pus and organisms to a further degree. Washing the canal with salt solution is a useful procedure which we have reserved for cases with thick fluid. The use of the bacteriolytic serum has materially reduced the mortality and has furthermore done much to lessen the unfortunate and distressing sequelae in the survivors. It is undoubtedly not as specific as we could wish. Failure to cure depends mainly on two factors: the first of these, early administration, has already been mentioned. We can conceive of no better way of pointing out the moral of using the serum early than presenting Flexner's often quoted statistics: Injected before the third day, 14.9 per cent. mortality; injected from the fourth to the seventh day, 22 per cent. mortality; injected after the seventh day, 36.4 per cent. mortality. So important is the early use of serum that it should be given in epidemics following the first spinal puncture if this shows a cloudy fluid, without waiting for the cytologic examination.

The second cause for failure of serum therapy probably lies in the absence in the serum of sufficient antagonistic antibodies for the particular strain of meningococci infecting the patient. Gordon, in England, and others have done work to prove that the meningococcus is divided into at least

four different strains, three of which are definitely agglutinable and the fourth comprising a group of as yet unagglutinable organisms. This multiplicity of strains is obviated to a certain extent by the use in the preparation of serum of meningococci obtained from many different sources, and explains why, at times, change in the serum used is followed by beneficial results.

There are many slight variations in the technic of injecting serum. The method pursued at the Children's Hospital this year has consisted in removing the spinal fluid until it flows very slowly, five to ten drops a minute, and then slowly injecting by syringe or preferably by gravity fifteen to twenty c. c. of antimeningococcic serum warmed to body temperature. This process has been repeated at twenty-four hour intervals and occasionally more frequently when the patient was very toxic. The fifteen or twenty c. c. of serum should be given at least three times, although the patient may be apparently cured by the initial dose. It is usually well, after serum is stopped, to do one or two simple lumbar punctures for the relief of the excess fluid remaining even after the organisms have disappeared. Persistence of fever, continued cloudiness or viscosity of the spinal fluid with failure to reduce Fehling's solution, meningococci still present in stained smear, and continued leucocytosis indicate the necessity of further treatment. Rigidity is one of the last symptoms to disappear and its continuance does not in itself necessitate puncture or serum injection.

It is often difficult to decide whether treatment should be persisted in. Sometimes the temperature is lowered, but the patient remains toxic; at other times fever continues, but the patient is decidedly better symptomatically. Under such circumstances it is usually wise to give another dose of serum. When the fluid is so thick that little is obtained, and then with difficulty, the canal should be washed with normal salt solution, using ten c. c. at a time and recovering it again before using more. This amount may be injected several times until the fluid is returned clearer, and the serum is then given slowly and carefully. We have found that this type of case bears puncture and especially the introduction of serum badly, and is liable to respiratory disturbance to the point of respiratory failure. These patients must therefore be very carefully observed, and the injection of serum stopped if any such effect occurs. It may be necessary under such circumstances to withdraw the serum already given. We have had no experience with Sophian's blood pressure readings in this connection.

The consideration of prognosis and mortality naturally follows. Series of cases treated by means of antimeningococcic serum have a mortality varying from twenty-five to fifty per cent. This represents a great advantage over the death rate obtaining before Flexner's first use of serum eight years ago. Epidemics of any disease vary in their severity regardless of treatment, and this explains in part the variable mortality during different years and in the hands of different investigators. This variation further depends upon age, time of injection, stage of epidemic, and the preparation of the serum itself. There are more deaths, as a rule, among babies than

among older children. This we believe to be due in part to the relatively difficult diagnosis in younger children, with consequent delay in specific treatment. Our mortality among eighteen children under one year of age was 42.2 per cent.; among nine children two years of age or younger, 44.4 per cent.; and in thirty-one children, all with one exception under four years of age, 48.4 per cent.

In conclusion, we wish to emphasize two facts which have impressed us during the last three months. 1. Cerebrospinal meningitis is curable in direct ratio to the promptness of treatment with antimeningococcic serum. 2. While we should be careful at all times to examine any sick child thoroughly, signs of cerebral and spinal irritation are to be especially sought for at the first inspection during periods of epidemics of cerebrospinal meningitis. This is all the more urgent when the illness has been suddenly ushered in by high fever, unexplained vomiting, drowsiness, convulsions, or intense headache.

1726 PINE STREET.

TREATMENT OF ECLAMPSIA.

A Plea for Individualization.

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So much has been written on the treatment of the toxemias of pregnancy and eclampsia that, with absolutely nothing new to add either as to etiology or the treatment, one should hesitate before entering the field. This paper is a practical summary of the treatment of these conditions from a rather varied and active clinical experience.

We must not forget that the only difference between eclampsia and a toxemia of pregnancy is one or more convulsions. I believe that the successful treatment of these conditions depends upon individualization. You cannot make any hard and fast rule as to what you will do in a case of eclampsia. To obtain the results you must thoroughly study the individual patient, her immediate needs, and the way to go about obtaining those needs under the existing circumstances. Cragin states that in every active maternity service the toxemias and eclampsias may usually be divided into two groups—renal and hepatic. In the renal type the symptoms are more or less of renal origin, which suggests renal deficiency. The underlying pathology is principally kidney pathology, and is in my opinion a temporary change in the majority of cases. In the hepatic type, the symptoms of liver disorder predominate, and though renal symptoms may be and usually are present, they are in the background. The liver pathology may be a hemorrhagic hepatitis with the findings of an acute yellow atrophy. There may be only a fatty degeneration of the cells around the central lobular veins or there may be extensive necrosis. The heart may also undergo fatty degeneration.

I purposely omit any discussion of the prophylaxis of the condition, but let me digress just far enough to express a conviction. I would prefer to

have my blood pressure apparatus than my urinalysis set in the management of *ante partum* cases if I had to be limited to the use of one of them. The systolic blood pressure in the majority of pregnant women is about 100. A rise in the original pressure, particularly if progressing, no matter how slowly, is an ominous warning, and nearly always begins before any abnormal substances appear in the urine. The average condition and appearance, and the usual symptoms of an eclamptic of the renal type upon admission to a general maternity service, are as follows: The patient is pregnant as a rule at or about full term; she has had one or more convulsions; she may be conscious, semiconscious or in coma. Inquiry will elicit the fact in the vast majority of cases that she has had none of the prophylaxis of pregnancy—no blood pressure readings and no urinalyses; she has been constipated and indiscreet as to diet, etc.; she is usually markedly edematous; eyelids, face, hands, feet, legs, and tongue are all markedly swollen. This edema pits upon pressure; breathing may be quiet or stertorous; pulse is increased in frequency and is full and bounding; the systolic blood pressure is anywhere from 150 to 250—pulse tension cannot be ascertained even approximately accurately with the finger; the urine is scanty, high colored and of high specific gravity; it is loaded with albumin and casts of all kinds and may contain acetone and diacetic acid; there may be no urine; there are usually visual disturbances.

What shall we do that will be to the best interest of that mother? I personally subordinate the baby's interests to those of the mother. I do not mean to say that I do not consider the baby, but I do not do a radical operation for the baby at the expense possibly of the mother. Babies born of eclamptic mothers are hazardous propositions anyway. Careful obstetricians perforate the head of a dead baby rather than do a forceps delivery. There are several points to be considered before making a decision as to procedure. I am strongly opposed to anything like the following: pregnancy at term; live baby; convulsion; Cesarean section. Every individual in the world has a certain amount of nervous energy and resistance, both a physiological and an ever ready or emergency resistance. Your energy and resistance would tide you over a certain hard pull, but the same amount of this energy would not take me over the same place, because you are one individual and I am another. We cannot explain it, but it is practical enough to be considered in the treatment of nearly every case of eclampsia. What is the individual patient able to do for herself? We have her history, blood pressure reading, urinary findings, and knowledge of her general medical condition. The following obstetrical conditions must be looked into in order to outline the treatment intelligently: the month of gestation; number of convulsions; parity; history of previous labor; pelvic measurements; position of the fetus *in utero*; probable size of the child; exact relation of the head to the pelvic brim; the condition of the membranes; the size and physical condition of the vagina and perineum; the shortening, consistency, dilatation, and effacement of the cervix; the probable character of her labor. An occiput posterior

presentation in a primipara seriously complicates the condition and is a full indication for a Cesarean section, as is a face and a brow presentation. Can we shorten the labor materially by the use of the rubber bag, with a forceps termination, or possibly a version, with deep episiotomy where indicated?

If we think that she will deliver herself with such aid in a reasonable length of time, that is what we will let her do. In the meantime, if the systolic pressure is high—175 or over—fluid extract of veratrum should be given by hypodermic in doses of three minims every two to four hours to keep the rate of the pulse to around 65 or 70 and the pressure as low as possible. Extremes are, of course, avoided. The more popular Norwood's tincture can be given in larger doses. The excessive acidity incident to the developing toxemia has extracted more or less of the fixed alkalis of the body, this being Nature's effort to overcome the acidity. By high colonic irrigations of soda solution of not less than two gallons the acidity is neutralized, the lower bowel is cleansed and fluid is furnished to the body. These are given every four hours as a rule. When restlessness demands, chloral and bromide are given per rectum. We do not believe that chloral has a deleterious action on either the liver or the kidneys. Morphine is given occasionally, but not nearly so often as in the past. It has long been a recognized classical treatment and is being revived in this country. Gastric lavage with soda solution should be done as often as is necessary, the oftener the better, if nausea or vomiting persists. I believe that it should be almost a routine. Elimination in the upper intestinal tract is stimulated by one grain doses of powdered calomel given on the tongue every hour for five doses. Magnesium sulphate is often left in the stomach after lavage.

The hot pack is not used as often as in the past, not because of a lack of results, but on account of the difficulty of the proper administration. Venesection is both simple and safe, and we never hesitate to do it when it is indicated, but veratrum, judiciously given, usually controls the hypertension. If the condition of the patient improves, convulsions cease, pulse tension lowers, the colonic irrigations are being well given, and labor is progressing evenly but slowly, we do not worry about the secretion of the urine. A method taught me by Polak to stimulate renal function is as follows: Dry cup over the region of each kidney and follow with a mustard sinapism over each kidney and after this two hot water bottles. I have seen results follow this treatment too often to discard it. The true eclamptic, with the severe congestion of the kidney, cloudy swelling, and fatty degeneration of the epithelium—the popular pregnancy nephritis—should be differentiated from the same condition implanted upon a chronic kidney lesion. Patients with the latter condition nearly always die, the condition being essentially a true uremia. Common sense and judgment must determine the completion of the case. As a rule, it is unwise, after the expectant plan of treatment has been instituted, to change and do the radical Cesarean. This is, of course, distinctly contraindicated if the membranes have been long ruptured or if there has been any

vaginal manipulation. The medical treatment plus a rigid milk diet is kept up until convalescence is well established. Do not stop treatment as soon as labor is finished. That is a grave error. The baby is not put to the breast until all the symptoms of the mother's toxemia have disappeared.

Proper consideration of the hepatic type of case is difficult. The clinical picture is often as follows: The patient is at or near term; there may be convulsions or stupor, often neither; there is dimness of vision or total blindness, slight or marked jaundice, no edema, and blood pressure around 140; urine contains a few casts and a small amount of albumin. In my opinion this is the type of eclamptic to fear most. This is the condition in which the liver destruction is marked; such a patient should be delivered as quickly as possible. I have never been confronted with the following, but if I had a true hepatic eclampsia with marked disturbances of vision, an elongated and unyielding cervix, and a dead baby, I believe that I would do an abdominal Cæsarean. It is needless to say that I would do the same if the baby were alive, the same condition being present.

Think over your cases of eclampsia. Can you remember many in which the baby was dead at the start? It strengthens the etiological theory that the baby and the placenta play the leading rôle. Verratum, bleeding, and as a rule opiates are contraindicated. The rapid liver destruction demands a quick delivery and as free from shock as possible. Chloroform anesthesia is deadly in this type of case, in fact in any toxicemic condition. Nitrous oxide and oxygen is the anesthetic of choice with ether oxygen next. If the patient is a multipara with the cervix partly dilated or effaced, use the dilating bags, successive sizes if necessary, and terminate the labor as soon as possible by forceps or version. A set of four of these bags costs only about a dollar and a half, and they are a great comfort in the intelligent practice of obstetrics. I cannot dilate and efface the cervix by manual means and deliver either by forceps or a version without materially jeopardizing the woman's future health with severe cervical tears and hemorrhage. I have tried it, but I will never do it again. The shock produced by such a procedure is often the deciding factor in the fatal issue. Vaginal Cæsarean section has a distinct place in the treatment of this condition, occasionally in a primipara at about eight months and in a multipara with a thick unyielding cervix at term or eight months. It is always contraindicated in a primipara at term and in any case in which the cervix cannot be well pulled down. The true obstetrician is careful about the differentiation of the words "dilatation" and "effacement." Eliminatives—diet and irrigations—are carried out as in the renal type. I have never seen a case of retinal hemorrhage that did not at least almost clear up. I recall a patient of the hepatic type on whom I did a Cæsarean who did not know what I looked like for about twelve days after delivery. I can recall several other similar cases.

I realize that every case of eclampsia cannot be pigeonholed into one or the other of these classes. I have omitted many points of importance, but have

tried to give in this brief space some practical points. My plea is to individualize each patient and study her. Accept no man's teachings in its entirety. Read all the teachings and let your medical common sense be the balance wheel. A mortality of twenty to forty per cent. from eclampsia in mothers is a blot of disgrace upon the medical profession.

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INSTRUCTION AND SUPERVISION OF EXPECTANT MOTHERS IN NEW YORK CITY.

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New York,

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(Concluded from page 55.)

The results of this special work show what intensive instruction and supervision of expectant mothers could accomplish in reducing the morbidity and mortality of mothers incident to pregnancy, the infant mortality due to congenital diseases, and deaths during the first month of life. We feel justified in expressing the hope that with a widespread realization of the importance of this subject and with a thorough organization, the following will come to pass: 1. A reduction in the number of maternal accidents, injuries, and deaths incident to pregnancy. 2. A reduction in the general infant mortality and morbidity, more particularly from the congenital diseases and during the first month of life. 3. A decrease in the number of still and premature births, thus increasing the number of living births and, indirectly, the general health of the mothers and the resistance of the infants. 4. The encouragement and increase of maternal nursing and the promotion of a more intelligent motherhood. 5. The production of healthier and stronger children at birth. 6. An improvement of the general wellbeing of the mothers and betterment of home conditions under which the family lives. 7. Improvement in the practice of midwifery because of increased supervision of midwives by personal contact with the nurses. 8. Diminution in the number of cases of sore eyes and ophthalmia neonatorum by instructing mothers to insist that silver nitrate be instilled into the baby's eyes directly after birth. 9. Bringing the mothers and babies under the educational and prophylactic influences of baby health stations as soon as possible after birth, thus making for better babies. 10. The establishment among the mothers of confidence which will cause them to seek similar instruction in future pregnancies, and to act as agents in inducing other mothers to place themselves under similar instruction.

We do not maintain that instruction and supervision of expectant mothers will affect deaths from all conditions classified under the heading "congenital diseases" and from all forces acting during intrauterine life. No amount of instruction and follow up will control congenital defects of the heart, brain, diaphragm, spine, biliary passages, etc., and no amount of careful control will eliminate all deaths due to prematurity or congenital feebleness. It is contended, however, that the greater number

of deaths due to congenital causes may be prevented. It has been stated that all the nurses of the baby health stations instruct expectant mothers whenever they meet them in their official capacity, albeit such instruction cannot, of necessity, be so intensive or prolonged as that given by the special nurses. Nevertheless, a fairly large field is covered, 5,420 mothers having been so instructed during the years 1914, 1915, and 1916.

No discussion on prenatal care is complete without reference to the midwife. Lest we be misunderstood, it is conceded at the outset that the untrained, unsupervised, careless, unclean, ignorant, unscrupulous midwife is a menace to mothers and children and to the community. On the other hand, we believe that in a city like New York, harboring so large an alien population which for hundreds of years has been bound to the midwife because of tradition, custom, and economic conditions, if you will, the proper kind of a midwife is a social necessity. We may even say with Jacobi: "A city or village without good midwives is like the *Titanic* without lifeboats." We know that the midwives in New York are carefully, systematically, and regularly supervised and instructed. We know that permission to practise is surrounded with rigid rules and regulations covering said practice; that provision is made for limitations as to the type of case which midwives are permitted to deliver—normal vertex presentation; that their responsibilities *ante partum*, during labor, and *post partum* with relation to danger signals, complications, etc., are carefully outlined; that they are instructed periodically as to all the methods which make for safety of mother and child within the limitations of their calling, and that errors of omission or commission are dealt with promptly. We feel, therefore, that the midwife situation of New York is well in hand and that their part in the maternal and infant mortality incidental to pregnancy is of small proportion. The legislative act regulating and restraining the practice of midwifery in New York State has been in force since 1907 and all physicians are agreed in stating that the severe types of puerperal infection so common in former years and so numerous as almost to fill maternity wards are today the exception rather than the rule. Strange as it may seem, the fact is that in comparison with our medical confrères, the midwives are listed on the credit side of the ledger, as this relates to the percentage of deaths from puerperal sepsis, from stillbirths, deaths during the first week of life, cases of ophthalmia neonatorum, and unreported births.

In ascribing deaths from puerperal sepsis to physicians and midwives, the records are so tabulated that if a midwife has been in attendance even for a period of only a few minutes, the case is listed against her. Despite this attitude which does not give the benefit of any doubt to the midwife, it has been found that while approximately forty per cent. of the births are reported by midwives, only twenty-two per cent. of the deaths from puerperal sepsis can be charged to them, whereas while physicians report approximately sixty per cent. of the births, sixty-nine per cent. of the women who died from puerperal septicemia are charged against them.

Dr. Lee Thomas, chief of the Division of Midwives and Foundlings, reports that the rate of puerperal sepsis, per 10,000 births attended, was ascribed as follows: Midwives: 1915, 8.6; 1916, 10.7. Physicians: 1915, 24.9; 1916, 20.7. Dr. Philip Van Ingen, in a study made, reports that in an area where eighty per cent. of the total births of Manhattan were reported, the following obtained: Births reported by physicians, forty-eight per cent.; by midwives, fifty-two per cent. Stillbirths reported by physicians, ninety per cent., or 1,199 cases; by midwives, ten per cent., or 122 cases. Dr. Lee Thomas, chief of the Division of Midwives and Foundlings, shows that the percentage of stillbirths and living births reported by physicians and midwives was as follows:

Year.	STILLBIRTHS.	
	Midwives.	Physicians.
1915.....	7 per cent.	93.0 per cent.
1916.....	5.1 per cent.	94.9 per cent.

Year.	LIVING BIRTHS.	
	Midwives.	Physicians.
1915.....	35.3 per cent.	64.7 per cent.
1916.....	33.8 per cent.	66.2 per cent.

In this same study, covering the same area, Doctor Van Ingen showed that of 581 deaths during the first week of life, 64.9 per cent. were delivered by physicians, and 35.1 per cent. by midwives. It is, of course, understood that inasmuch as the physicians deliver the complicated and abnormal cases, the percentage of stillbirths in their practice will be larger than in the practice of midwives, who are supposed to attend to normal vertex presentation only. Even at that, however, the percentage seems out of proportion. It is common knowledge that prophylactic instillation into the eyes of the newborn of various silver preparations is more commonly practised by the midwives of this city than by physicians. This procedure is a mandatory provision of the permit to practise midwifery, and midwives are supplied free of cost by the Department with wax ampules containing a one per cent. solution of silver nitrate, the contents of one ampule being sufficient for the use of two drops in each eye. Midwives are required, under the provisions of their license, to report all cases of sore eyes to the Department of Health and for the most part they are prompt in so doing. Physicians, on the other hand, although required under Section 91 of the Sanitary Code to report all persons affected with suppurative conjunctivitis, are frequently negligent in this regard. A true comparison, therefore, of the number of cases of ophthalmia neonatorum occurring in the practice of physicians and midwives is difficult to establish. The records of the Division of Midwives and Foundlings show the following number of cases of ophthalmia neonatorum recorded for the years 1915 and 1916: physicians, thirty-one in 1915 and fourteen in 1916; midwife, seventeen in 1915 and eighteen in 1916; institution, seventy-two in 1915 and fifty-six in 1916; other, two in 1915 and two in 1916. Although the percentage of births registered by physicians and midwives in this city at the present time is ninety-nine, the complaints registered against them for delayed registration or failure to register births shows that the physicians are more

negligent in this regard than the midwives. From January 1 to December 20, 1916, there were 415 complaints registered against physicians and 168 against midwives.

I have interjected these remarks on the midwife because of a desire to show that the midwife, at least, has been educated by the city up to the limitations of her calling. She has been taught just how far she may go and when she must call for medical assistance. If we are to be honest with ourselves, can we say the same of a large number of the medical profession, many of whom are engaged in the practice of obstetrics because they must, rather than because they want to, and who in their impatience or because of activities in other lines, resort to unnecessary, untimely, or unwarranted interference? It is largely a question of meddlesome obstetrics on the part of the physician, as against watchful waiting on the part of the midwife, that is responsible for the comparatively good showing of the carefully trained and supervised midwife. We have striven to make the midwife our ally in the drive for bringing home to mothers the need of care before the arrival of the baby, and to that end we have published a small handbook under the heading *What Midwives Should Teach Pregnant Women*, for distribution by midwives among their clientele. In addition, we have held meetings at various points throughout the city with the midwives at which the chief of the Division of Midwives and Foundlings has emphasized their responsibility to the mothers coming under their care, not only during the period of labor and shortly thereafter, but also during the prenatal period. We have circularized the midwives of the city through letters, calling attention to the importance of prenatal care, and requesting their cooperation to the end that they submit to the nurses who visit them periodically the names of prospective mothers, assuring them that our desire is not to encroach upon the rights received by them under their license, but rather to help their clientele go through the period of pregnancy and delivery under the best possible conditions. Their response has been generous and an unusually large number of prospective mothers have been reached in this way. All this has served not only to interest many pregnant women who through custom have waited until "the last minute" before calling in the attendant, but it has impressed upon the midwife the fact that her calling means a greater responsibility than the mere delivery of women intrusted to her charge.

During the process of development of this work there has arisen a need for more coordinated effort on the part of the maternity hospitals and clinics, the baby health stations and allied child welfare agencies. The Advisory Council of the Department of Health has therefore asked a committee of obstetricians to consider and report upon a practical plan of cooperation among the maternity hospitals of the city, with a view to districting the city for prenatal and obstetrical care. The committee has studied the problem, and has submitted a report in which it recommended that the Borough of Manhattan be divided into zones or districts, within whose boundaries all expectant mothers must eventually seek the necessary prenatal care, delivery, and

post partum attention from the various baby health stations, clinics, hospitals, maternity institutions, and other organizations affording such care and operating within the confines of such zones. An outgrowth of this committee's deliberations has been the organization of a maternity welfare association. When this plan proves a success it will do much to correlate all existing facilities. Certain it is, that the proposal has already stimulated the cooperation and enthusiasm of other organizations and individuals to an endeavor for spreading a knowledge of the importance of prenatal instruction and supervision. It is true that there are minor difficulties surrounding this plan, such as, the necessity of certain maternity institutions having a definite number of cases for teaching purposes, the desire of certain women to be delivered at particular institutions, the religious or racial feelings of the mothers, the topography of the borough with reference to the maternity institutions, etc., All these, however, will in time adjust themselves as the maternity institutions cooperate and as the public becomes educated to the district plan of organization. Zoning of the city for the purpose of extending instruction and supervision of expectant mothers by the largest possible number of agencies must come and will come with an extension of this work. As more nurses are appointed by the city for this work, as maternity hospitals secure funds for the appointment of nurses to give prenatal instruction, as allied childbearing agencies and other organizations take up this work, districting of the city along lines now maintained by the baby health stations will become comparatively simple. It is a matter of secondary importance as to the particular institution at which the woman is delivered, provided, of course, this institution is properly equipped and managed. It is a matter of primary and vital importance, however, that all these women be instructed up to the time they enter these institutions.

A factor to be considered in zoning for prenatal care is the migratory character of our population. The many intensive studies conducted by the Bureau of Child Hygiene, which make it necessary to follow up families for an entire year, invariably disclosed the fact that from thirty-five to forty per cent. of the population of childbearing age of a given section remove during the year, and that some of these families remove as frequently as three or four times during the year. With the city districted and with a nurse in each of these districts, the mother could be reached at her new address by a simple process of transfer card. Prenatal instruction in the true sense is much broader than institutional care. In fact, the problem of instruction and supervision of expectant mothers, as it relates to maternal morbidity and mortality, and deaths from congenital diseases, bears only a small relation to the maternity institutions. The New York Milk Committee, in analyzing the situation for the Borough of Manhattan, reports that with about 68,000 births in that borough for the year 1915, the returns from hospitals, reporting their in and out service, showed that 12,056 cases were taken care of within the institution and 7,691 cases in the homes, so that about thirty per cent. of all mothers delivered in the

Borough of Manhattan were delivered in or through the maternity institutions. When it is considered that a large number of these were not given persistent prenatal care, when it is remembered that more than one third of these 68,000 births were delivered by midwives and a large part of the balance by general practitioners, the need for intensive prenatal care becomes apparent. It must be remembered, also, that Manhattan is fortunate in having a comparatively large number of well equipped maternity institutions, while in the other boroughs of the city there is a dearth of proper facilities for this work. The official records of the Department of Health show that during 1916, out of 61,235 births occurring in the Borough of Manhattan, 13,695, or twenty-two per cent., took place in institutions and 47,540, or seventy-eight per cent. in tenements. Of the total number of births in the borough, 2,592 mothers lived in other boroughs and came to Manhattan for delivery. Of these, 2,460 were delivered in institutions and 132 in tenements. Here we have another argument for the need of city wide prenatal care.

The various maternity institutions of the city can do much toward furthering the care of expectant mothers. Their duty and responsibility toward the pregnant woman are far greater than mere registration, periodical examination and measurement, and final delivery. The future mother is in need of care and follow up from as early in pregnancy as possible until at least one month after delivery. It should be incumbent upon such institutions as receive city money to have attached to their service trained nurses or social service workers who will visit the homes of registered women within the confines of an allotted district at least, and give prenatal and early postnatal care; otherwise their program for the care of pregnant women is incomplete. Other institutions, if they would do their full duty toward their clientele, should do likewise. With a large number of such nurses, in addition to the nurses of the Department of Health, definite districts for prenatal care should be outlined, and there would result a coordinated system of prenatal instruction which would make for very definite results. By a system of exchange, an expectant mother in the lower section of the city, about to be delivered in an institution uptown, could be given prenatal instruction by the nurse of that district, and vice versa, so that eventually all institutions would know that prenatal care would be provided. If the institutions feel that they are financially handicapped in this regard, then it becomes incumbent upon them to refer their expectant mothers to one of the fifty-nine baby health stations of the Department of Health for home visitation, resting assured that all necessary advice will be given, that all untoward signs or symptoms will be referred to them immediately, and that their rights and prerogatives will not be disturbed in the slightest degree. The great need is to educate the public, who are unable to pay for obstetrical care, to the use of properly equipped maternity institutions and to direct them there. This can be accomplished by a corps of field nurses or workers, such as above outlined.

There are many problems within this problem of

prenatal care that future studies and observation will clear up. The problems of the use of alcohol during pregnancy, of gainful occupation during pregnancy and shortly after delivery, of more definite causes of stillbirths and premature births, of congenital diseases among the negroes, of increased and better obstetrical facilities in homes and institutions will all have to be worked out and faced at no distant date. They all present difficulties, but they are not insurmountable. The use of alcohol during pregnancy is a subject upon which, from a municipal standpoint, reliable and accurate figures are exceedingly difficult to obtain. What constitutes alcoholism? What daily consumption of beer, wine, brandy, whiskey, or patent medicines stamps one as an alcoholic? What direct effect has such use upon offspring? What method can a city nurse adopt to secure precise information regarding these questions for future application? The Italian and French mother has used and still uses her light wine; the German and the Irish mother uses beer and ale to a moderate degree, despite all instructions to the contrary, and will continue to do so unless we can present convincing data that such use is harmful and dangerous.

The prolonged and excessive use of alcohol will produce connective tissue changes and cellular degeneration in the various organs of the mother with resultant ill effects upon herself and the future offspring. Alcoholism in the father, while not so directly affecting the child, indirectly robs both mother and child of economic resources which would give better medical and nursing service, food, clothing, shelter, comfort, ease of mind, and improved environment. Herein lies a fertile field for educating expectant fathers in their great responsibility toward motherhood. Dr. Hugh T. Ashby, in his book on infant mortality, states: "It is considered proved that alcohol does pass from the mother to the fetus and may injure the tissues and retard the development of the cells." As to the influence of alcoholism on stillbirths he quotes the following figures collected by Dr. W. C. Sullivan:

	Number of mothers	Number of children	Number of children dead in two years	Percentage of dead children
Drunken mothers...	21	125	69	55.2
Sober mothers.....	28	138	33	23.9

"These figures show that the children from the drunken mothers succumb in greater numbers than the others, but how much this is due to antenatal injury, it is hard to say."

In an effort to secure some idea as to the relation of alcoholism to the future offspring, the records of the prenatal nurses for the years 1914 and 1915 were tabulated as follows: Mothers delivered of living children, 2,311; mothers delivered of stillbirths, eighty-four; total mothers delivered, 2,395. Of the 2,311 mothers delivered of living children, 492, or twenty-one per cent., used alcohol occasionally; 742, or thirty-two per cent., used alcohol moderately; eighty-seven or 3.5 per cent. used alcohol habitually.

Perhaps the most that can be said on this subject is, in the words of Doctor Ashby: "Whichever side we take there can be no doubt that the taking of

alcohol by a mother, and we may add the father, before the birth of her child has the effect of producing more poverty, which means a weakly and a less healthy baby."

The working mother does not present so great a problem in this city as in some neighboring factory or manufacturing towns. If a mother continues at work until delivery or returns to work soon thereafter, this must of necessity affect her health and diminish her chances of nursing her baby or caring for herself properly. While in some sections of this city gainful occupation at these times is not uncommon, especially among Bohemians, Italians and negroes, as a general proposition for the city this is not a very important factor. An analysis of this situation made in New York showed that approximately fifteen per cent. of the pregnant women were engaged in work before or shortly after delivery. As this study was made in various sections of the city, this figure gives a fair cross-section estimate of the situation throughout the city, but the conditions is sufficiently important among certain classes to demand more attention. Whatever are the merits or shortcomings of health insurance acts, there is a greater unanimity of favorable opinion for maternity insurance clauses than for any other sections of these acts. It is self-evident that any measure which would make it possible for the pregnant woman to receive a weekly stipend and proper medical and nursing care, and to discontinue work two weeks before delivery, not returning until at least four weeks thereafter, would be a determining factor of great moment in making for better and healthier mothers and babies. We have a law prohibiting the employment of women shortly after delivery, in the form of Section 93A of the Laws Relating to Labor, Factories and Mercantile Establishments, as follows: "Employment of females after childbirth prohibited: It shall be unlawful for the owner, proprietor, manager, foreman or other person in authority of any factory, mercantile establishment, mill or workshop, to knowingly employ a female, or permit a female to be so employed, within four weeks after she has given birth to a child." It is common knowledge that, like so many of our laws, this one has never been enforced, nor does it require any stretch of the imagination to picture what a hardship such enforcement would entail in many instances under present conditions. The maternity clause of the health insurance act would give us a law with the desire and opportunity for its enforcement without any conscientious scruples.

Much is still to be learned of the causes of stillbirths and premature births. Alcoholism, syphilis, retroflexion, diseased annexa, general constitutional diseases, etc., will not answer the question entirely. Apart from the fact that the infant mortality rate among colored people is more than double that among the whites, the mortality rate from congenital diseases in this group is seventy-one per 1,000 births as against forty-one for the entire city. Colored mothers stand sorely in need of prenatal care. This care, however, is more intimately associated in this case with the entire negro problem as it confronts us in New York, a problem which, because of a con-

tinuous increase in the colored population, is becoming greater and more complex from year to year. Racial resistance, syphilis, alcohol, overcrowding, illegitimacy, improper care of newborn infants, baby farms, the working mother, industrial limitations, and personal and home hygiene are a few of the conditions which must engage our attention. In two sections of the city inhabited largely by colored people, the Columbus Hill district and upper Harlem, we have placed special nurses for instruction in prenatal care, and in the former district the Association for Improving the Condition of the Poor has assigned a nurse to work in cooperation with us. Better obstetrical care for the poor and for those of moderate means is a dire need. With the best of intentions on the part of maternity institutions, the accommodations are insufficient, taking the city as a whole, for persons of moderate means. As with general hospitals, so with maternity institutions, the very rich and the very poor find their place, but the thrifty, sober, earnest middle class, willing to pay for service within the limitation of their income, fail of admission to institutions even when they are anxious to enter. For the large number who still desire to remain at home, to keep their watchful eyes upon their families and by their direction to keep the family intact, good, sufficient, and moderately cheap or free outdoor maternity service is insufficient. It is this condition that forces so many expectant mothers to the midwives and uninterested practitioners.

There are still other ways in which many more prospective mothers could receive the benefits of instruction. Many physicians have assumed an attitude of pacifism as regards prenatal instruction that is almost incomprehensible. Granting that multitudinous duties have made them careless in this regard, they still have failed to take advantage of the service offered by the baby health stations, whose nurses are at their command for such instruction and supervision of their prospective mothers as they outline, without interference by word or action with their management of the case. If physicians would seek the cooperation of the nurses of this bureau in this direction, thousands of mothers would be benefited. As previously stated, prenatal care and its proper application include care of the infant during the most crucial period of its existence, the first month. No plan of organization by the Department of Health could be sufficiently complete to reach the 137,000 children born annually. In order, however, to arouse all mothers to the importance of the conservation of infant life, the Department of Health has found ways and means to reach all of them in an educational way by forwarding to the mother, upon receipt of a record of birth, an acknowledgment of such report in the form of a transcript of the record, signed by His Honor The Mayor and the Commissioner of Health, with a letter from the Commissioner of Health, calling attention to the need and importance of infant care, together with educational literature on preventive measures, in the form of a pamphlet entitled *Ten Commandments for Keeping the Baby Well*. This innovation was the result of an analysis by the department which showed that the mortality among children of native

mothers was higher than among those of the so called "tenement population" which had been reached by intensive educational work for many years. While we are of the opinion that the best form of educational propaganda is through personal contact with the mother, in the absence of a sufficient force to visit every mother in the city, we feel that this means of reaching them will at least point the way to the facilities offered by the Department of Health, and set them thinking as to the importance of prevention as compared with correction. Although much has been accomplished, only a beginning has been made. The great world conflict has brought home to all of us the value of the greatest of assets, human life, and now more than ever do we see that the nation that has the babies has the future.

Great possibilities are in store for those who apply themselves to this problem of prenatal care, but it will call for all the coordinated, correlated, intensive, and unselfish application at our command. We have reached the point now where, try as we may, the reduction in infant mortality will be small unless we make an impression upon the deaths from congenital diseases. To do this, we must work, and to that end we must bring all the resources within our power. As Commissioner Emerson put it at a recent discussion on this subject: "The city pays for burying people, why should it not contribute towards bringing healthy people into the world?" Inquiry from the Department of Charities shows that approximately \$5,000 annually is spent for lumber to bury the pauper dead. When you add to this the overhead expenses necessary for these burials, the force of the Commissioner's statement becomes evident.

The needs of the system of instruction and supervision of expectant mothers, as they present themselves to us in New York, may be summarized as follows: 1. Zoning or districting the city along lines of the baby health station service, for instruction or follow up by nurses or social workers, in the home, of mothers during the period of pregnancy, and for as long a period thereafter as necessary or possible, preferably one year. 2. Assignment by maternity institutions, whether with an in or out service, of nurses or social workers, within prescribed districts, for the instruction and supervision of expectant mothers. In the absence of such appointment, these institutions should register with the Department of Health all prospective mothers enrolled, so that the nurses of the department may give the necessary advice and instruction, in cooperation with said institutions. 3. Referring all mothers and babies discharged from maternity institutions to the baby health stations nearest their home addresses, following this with notification to the Department of Health of all babies so discharged. 4. Cooperation of all private physicians in availing themselves of the services of the nurses of the baby health stations, so that mothers under their supervision may be instructed in the hygiene of pregnancy and referred to them in the event of untoward signs and symptoms. Settlements, neighborhood guilds, churches, and day nurseries, should refer to the baby health stations all expectant mothers coming

to their notice. 5. An educational campaign of instruction for expectant fathers in order to arouse them to their duty and responsibility towards the mother and the future offspring. 6. Increased interest and cooperation of philanthropic organizations and individuals in the establishment of a prenatal service within prescribed districts and in furnishing to worthy mothers necessary material aid in the form of food, clothing, aftercare, baby outfits, and obstetrical outfits, this to supplement a large amount of such aid and relief at present afforded by the united relief agencies and charity organizations of a public and private nature. 7. A municipal or philanthropic employment organization for securing work for unemployed expectant fathers so as to reduce to the lowest possible minimum the gainful occupation of the mother before or shortly after delivery, this to act as a substitute until the possible passage of a health insurance bill, which includes maternity insurance. 8. Enactment of legislation prohibiting the employment of pregnant women in factories or manufacturing or mercantile establishments, for a period of two weeks prior to, and at least four weeks after, delivery, with provision for weekly stipends and care during this period, or, as a possible substitute, the establishment of day nurseries in or adjacent to factories, in charge of trained nurses, where mothers may nurse their babies, or where properly regulated artificial feeding can be maintained. This has been done in France, Russia, and Italy; why not here? This will increase maternal nursing, decrease deaths during the first month of life, and do away, to a great extent, with the prevalent custom of leaving these infants in charge of old "mammies" and irresponsible neighbors. 9. Increased appropriation by city authorities for the appointment of an augmented corps of nurses for instruction and supervision of expectant mothers, not so much with a view to reaching all the prospective mothers—for that is wellnigh impossible—but to act as a wedge, by educational propaganda, into the inertia which now exists as to the urgency and importance of this problem. 10. Intensive studies as to the causes of still and premature births by careful analysis of the histories, examinations of the mothers, and autopsy findings on infants. 11. Provision for improved and increased obstetrical care in homes and institutions for those able to pay only a moderate fee or unable to pay at all. This presupposes greater and better outdoor maternity service, and a larger number of properly equipped maternity institutions throughout the city. If the public could be taught that such service might be obtained the midwife problem and the meddlesome accoucheur would adjust themselves, and hospitalization for delivery would become popular. 12. The application of an excessive supply of breast milk in mothers for the use of premature and delicate infants within the maternity institutions, or in the neighborhood, rather than the sale of the same for babies of the better classes, who can have other advantages, such as wet nurses, trained nurses, good surroundings, personal attention, proper clothing, etc., that money can buy and who can better be tided over a dangerous period than those of the poor. 13. Follow up of newborn

babies by maternity institutions, directly or indirectly, for the entire first year of life, as at present conducted by the pediatric service of the Berwind Free Maternity Clinic and Lebanon Hospital. Such work, when undertaken by these institutions, will leave the city free to apply itself to the large number of cases now unsupervised because of an insufficient working force. 14. Education of the public to the importance of having mothers who give birth to stillborn infants, or who lose their children during the first year of life, act as wet nurses whenever possible, or give their breast milk, for a limited period at least, to the worthy poor. Publicity should be given this subject, and these mothers should be urged to register voluntarily with the Department of Health. 15. Persistent education as to the care of the breasts and the importance of maternal nursing, as the remedy *par excellence* in the reduction of infant morbidity and mortality, especially during the first month of life. The dangers of artificial feeding should be emphasized and "back to the breast" should be the slogan. 16. Provision for an increased number of temporary shelters, where mothers about to be delivered in institutions may place their infants and children during the period of confinement, and thus secure that peace of mind and contentment which is essential for the prospective mother. 17. The establishment at various centres throughout the city—the Department of Health, settlements, hospitals, museums, etc.—of permanent exhibits showing the various phases of prenatal and infant care. This should consist of photographs, charts, convincing statistics and literature. Periodical lectures, lantern slides, and moving pictures could be added, as indicated. In other words, prenatal care should be popularized.

Commissioner Emerson, in his effort to coordinate all existing forces for the control of this problem, has said: "Now, in this time of international awakening, when lives are more recklessly spent and for greater purposes than ever before, lives become more precious and their waste a greater reproach." There are three things necessary for maintaining war and for a proper organization of prenatal care—money, money, and more money. There are three things necessary for stopping war and for controlling maternal morbidity and mortality and reducing the mortality rate from congenital diseases—education, education, and more education.

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Meningitis.—Edwin E. Graham (*Pennsylvania Medical Journal*, December, 1917) concludes that an accurate history is of great aid in the diagnosis not only of meningitis, but usually give some indications as to the form of meningitis present. Three groups are to be distinguished: 1, acute suppurative; 2, tuberculous; 3, cerebrospinal fever. The symptoms may point to the presence of a certain form. The only positive way to decide is to perform lumbar puncture which is of great value in both the prognosis and treatment. The cerebral type of infantile paralysis is really a polioencephalitis. An early lumbar puncture, the early paralysis, and the presence of an epidemic are aids to diagnosis.

MYALGIA OF AN ISOLATED PORTION OF A MUSCLE.

BY ALFRED GORDON, M. D.,
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In a contribution entitled, *Overactivity as a Potent Factor in the Etiology of some Nervous Diseases* (1), a large array of facts was presented to demonstrate the effect of overfunction of organs on their early morbidity. In cases of tabes, paresis, chronic plumbism, poliomyelitis, and progressive muscular atrophy it was concluded that a body potentially diseased or under the influence of a disordered metabolism through the presence of a toxic material will develop morbid phenomena primarily in parts functionally exhausted.

Weigert long ago called attention to the fact that the functioning of a tissue is accomplished by its destruction which in normal conditions is rapidly compensated by a proper supply of nutrition. If the latter is not forthcoming the equilibrium is disturbed and degeneration takes place. Edinger (2) went further and said that if instead of or with a defective nutritive supply there is an excessive functioning of a cell, the increased growth of the neighboring cells will lead to a degeneration of that overactive cell which is then less resistant. This is particularly evident when both elements are at work, namely, overactivity and nutritional deficiency. The rationality of this contention finds corroboration in the experimental work of Edinger. He administered pyrodoxin to rats and produced anemia. Then by certain contrivances he made them perform a considerable muscular activity. The result was that all anemic rats showed at necropsy a degenerative state of the spinal cord. The control animals, which, after the injections of pyrodoxin, remained at rest, presented a total integrity of their spinal cords. It is therefore manifest that superfunction is a powerful predisposing factor in producing diseased conditions in an individual whose organism is potentially under the influence of abnormal elements. In that contribution the medical histories of thirty-seven patients suffering from various occupation neuroses were given. They all presented characteristic neuroathenic manifestations and all appeared to be underfed. There were stenographers, reporters, violinists, pianists, and shoemakers. The neuroses in one particular segment or portion of a limb was due to a predominance of effort practised by the affected region. For example, the violinist who had attacks of cramps in the left hand happened to be left-handed. The pianists with paretic attacks in the wrists were trained by teachers whose method consisted of holding the wrist stiff during the exercises.

In the present communication attention is called to a peculiar localization of a disorder in eight individuals whose occupations consisted of uninterrupted and uniform movements in one special direction. The disturbance was strictly confined to the lower portion of the serratus magnus on the right side in six right-handed women and on the left side in two left-handed men.

CASE I.—M. S., girl of eighteen years, employed in a department store. Her duties consisted of picking up from a low table bundles of clothes and placing them on a high

shelf. She was very poor and had to support her parents. She was obliged to economize and eat only one meal a day.

CASE II.—F. S., a woman of forty-two years, single, was engaged for four weeks to rearrange the stock of ladies' goods in a large firm which expected to liquidate. Her work consisted of removing packages from an upper shelf

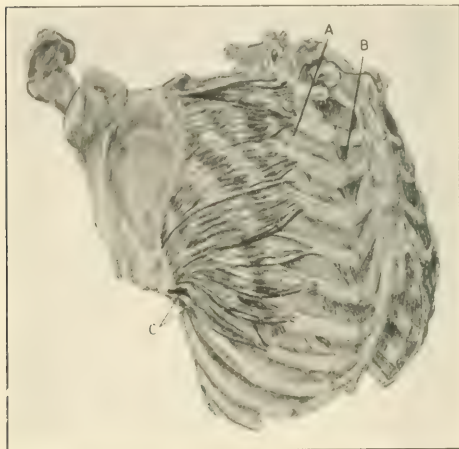


FIG. 1.—Showing the insertion of the three portions of the serratus magnus. A, external intercostal muscle; B, internal intercostal muscle; C, lower portion of the serratus magnus. (After Deaver.)

This had to be done rapidly. At the time of the engagement she was recovering from a protracted attack of influenza which left her quite debilitated.

CASE III.—A. O'B., girl of twenty-one years, was employed in a restaurant. Her duties consisted of drying dishes and placing them in an upper closet. The business was very active and the girl worked strenuously for several hours in succession for many months. She was very frail and had considerable anxiety about a sister who had tuberculosis. Her present myalgia developed after an especially hard day of work.

CASE IV.—H. G., girl of fifteen years, employed in a large general store for carrying bundles of clothing from one floor to the other. As they were quite heavy she always placed them on her right shoulder. Her domestic life was most unhappy. Her stepmother maltreated her and did not feed her sufficiently.

CASE V.—M. Q., married woman, aged twenty-seven years, emaciated, carried her crippled child three years of age on her right arm for hours at a time. Once the child was particularly ill and the devoted mother had her in her arms the entire day. The troublesome condition in the serratus then made its appearance.

CASE VI.—A. M., girl of twenty-four years, was employed in a large shoe store for a period of six weeks. Her work consisted of handing to another girl placed above her on steps packages for assortment. It had to be done rapidly and for three hours daily. The patient was tuberculous.

CASE VII.—G. E., boy of nineteen years, affected with chronic bronchitis, obtained a position delivering packages. Being left-handed, he carried the burden in the left arm. Weak and underfed because of poverty, he did not continue his occupation longer than three weeks when the myalgia developed.

CASE VIII.—F. D., shoemaker, forty years old, contracted pneumonia. During convalescence and before he regained his health he returned to his work and applied himself most strenuously to make up for the lost time. The myalgia of the left serratus muscle soon developed. He was left-handed.

Referring to the anatomy and physiology of the

serratus magnus we may recall the following data. It arises by nine fleshy digitations from the upper eight ribs and the interspaces on the anterior part of the thorax. The fibres converge backward and are attached to the anterior surface of the vertebral border and of the upper and lower angles of the scapula. It presents three portions: the upper is attached to the superior angle, the middle portion to the vertebral border, and the lower portion to the oval space on the anterior surface of the inferior angle of the scapula. (See Fig. 1.) The nerve supply is from the long thoracic nerve.

The function of the serratus magnus consists of carrying the scapula and the shoulder outward, forward, and upward. It holds the scapula firmly against the chest wall. The lower portion of the muscle is the most powerful and its function deserves special mention. If the scapula is fixed close to the spinal column the lower portion of the muscle will evert and draw the ribs upward, thus pushing the sternum outward and increasing the diameters of the chest. In the next place by holding the lower angle of the scapula forward the lower fibres will permit the trapezii to draw the shoulder upward and thus it will help to sustain weight on the shoulder. Finally, the lower portion of the muscle pulls the inferior angle of the scapula forward and it helps to raise the arm to a right angle.

Applying these physiological data to the morbid condition in our eight patients, one can readily explain the phenomenon observed uniformly in all. It consisted of a pain localized on the anterior surface of the inferior angle of one scapula, on the right side in the right-handed individuals and on the left side in the left-handed patients. The pain was described by them as aching, drawing, stretching, pulling. It was constant but especially manifest in performing certain acts which necessitated raising the arm and placing it forward, also in one case in carrying a weight on the shoulder. In the latter case in order to maintain the weight the trapezius had to pull the shoulder upward which act is always accompanied by a forward pull of the lower angle of the scapula; the latter is controlled by the lower



FIG. 2.—A, the exact seat of the pain.

strong fibres of the serratus magnus. In all the other cases the work entailed raising the arm always in the same direction, which necessitated a constant pulling on the lower angle of the scapula. The patient's work was uniform and this uninterrupted, rapid uniformity continued daily for hours at a time. It does not require special emphasis to explain the singular occurrence of pain which was strictly confined to the lower angle of the scapula at its anterior surface. Every one of the patients indicated with mathematical precision the area of pain (Fig. 2).

An objective examination revealed an equal uniformity in all cases as to the localization of the affected area. An exquisite tenderness was elicited upon pressure of the musculature immediately under the pointed small area of the lower angle of the scapula when the fingers of the examiner were pushed upward. No other muscle in the closest vicinity of this limited area exhibited any sensitiveness to pressure. Further examination of the involved area showed no objective sensory disturbances when tested for touch, pain, and temperature. There was no evident atrophy of the muscles, but in four of the female cases, II, III, V, and VI, there was some slight recession of the angle of the scapula from the thorax, pointing perhaps to some wasting of the inferior portion of the serratus, but this was not certain, as the patients were perfectly able to perform the functions of all individual muscles on the affected side. Electrical examination was totally negative to both galvanic and faradic currents.

There were no evidences of distinct neuritis of the long thoracic nerve, as pain in the neck at its seat of origin and on the side of the thorax was absent. The patients were all able to raise their arms above a horizontal position, which is not possible when the long thoracic nerve is involved. Besides, the winglike scapulæ were not in evidence in any of the cases. Finally objective sensory disturbances and muscular wasting as mentioned above were absent over the area of distribution of the nerve. The entire condition therefore consisted exclusively of an objective tenderness and subjective paresthesias strictly limited to the lower thick portion of the serratus magnus.

It is interesting to observe that the affection was confined to the side on which the arm was particularly exercised and overfunctioning. In the entire series there was present a general physiological condition which undoubtedly had its predisposing influence in the causation of the disorder. We find there all the elements for Edinger's requirements in its "exhaustion view," namely, an excessive functioning of cells and a defective nutritive supply, such as he realized in his experiments. That the state of nutrition plays a powerful rôle in the attempts of restoring the function of the affected muscle could be seen from the fact that when removal from the usual occupation was undertaken by some of the patients and improvement in the general condition could not be obtained for want of necessary nutritive elements, the myalgia remained unaltered. On the other hand when in some cases in addition to the abandonment of the usual work, successful efforts were made in raising the state of the general

nutrition, satisfactory results followed. In all the cases the treatment consisted primarily of cessation of the habitual work and special stress was laid on improving the general nutrition. The results were highly satisfactory. Local massage enhanced the recovery.

The observations related here are interesting for the following reasons: 1. The occurrence of pain at the level of insertion of an isolated portion of a muscle and especially of the serratus magnus is very exceptional. 2. Its occurrence is possible without an involvement of the nerve distributed in the muscle. 3. Muscle pain is possible without a neuritis. 4. Overfunction of an organ or a tissue leads to its morbidity, when the body is under the influence of a disordered metabolism.

The essential nature of myalgia is but little understood. The data we possess point to an involvement of the muscles, namely muscle sheath, tendon, and fascia. The name fibrositis is so far well applicable. Like all inflammatory processes it is accompanied by a serous exudate which is either absorbed or else remains chronic and nodules are in consequence formed. Stockman is one of the very few who studied these nodules histologically. The latter showed on sections to consist of the fibrous sheath of hypertrophied muscle. In place of the fibre, tissue penetrated between the muscle fibres, some of which were degenerated; the small vessels showed periarteritis. These morbid findings suggest either chronic infection or the influence of toxins. That there was a state of faulty metabolism in my patients can be seen from the morbid general condition and low nutritive state of every individual. As the tissue proteins break down in starvation, various abnormal chemical elements are formed. On the other hand fatigue is the result of activity by which a cell is less readily put into action again. Chemically speaking fatigue is characterized by a production of lactic acid at a greater rate than it can be replaced by the oxidation process. Lactic acid has undoubtedly a toxic effect on the muscle and as long as it is not removed by oxidation the muscle will be incapable of full activity. It seems therefore that the abnormal muscular chemistry together with the general faulty metabolism is apt to explain comprehensibly the pathogenesis of myalgia without having recourse to the conception of fibrositis which with the exception of one case of Stockman is far from being a constant finding.

The view of a general toxicity together with a local toxicity caused by an overfunctioning of a muscle appears to explain the problem of myalgia. Such a pathogenesis finds its corroboration in therapeutic efforts. The patients were all removed from work so that the muscles were given ample time to oxidize the accumulated surplus of lactic acid and much attention was paid to ameliorating as rapidly as possible the state of starvation in which all the patients were found. The results were uniformly good.

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1812 SPRUCE STREET.

COLITIS.

BY ALBERT C. GEYSER, M. D.,
New York.

Of all the diseases to which the human flesh is heir, none are more puzzling to the physician nor more annoying to the patient than lesions of the large intestines. This is especially true of the lower portion or the large colon. I will omit from consideration all such lesions as kinks, bands, adhesions, and new growths. These are entirely surgical.

ANATOMY.

The colon begins at the head of the cecum and ends with the rectal pouch. It has been computed that in about twenty-nine per cent. of cases the ileocecal valve is incompetent. Personally I have never laid much stress upon this incompetency because a provision of Nature has retained a nice balance in such emergencies. The contents of the small intestines, as they pass through the valve into the cecum, are in a fluid state. They remain so in the cecum and in the ascending portion of the colon. A slight amount of regurgitation, while not desirable, is not cause for serious alarm. It is also possible that the twenty-nine per cent. of incompetencies of this valve is a wrong estimate. When the lower bowel is filled with bismuth paste, the patient is very apt to make violent efforts at retention. The bowel makes equally violent attempts to expel the foreign mass. Something must give way; if the rectal sphincter is stronger than the ileocecal valve, incompetency will manifest itself. May this not be a safety valve rather than a deficiency? Here we are able to find a reason for at least a certain proportion of pathological states in this region. Let us suppose that a patient under the average stress of business life is obliged to forego the regular calls of Nature. By a violent contraction of the rectal sphincters a reverse peristalsis is set up in the large bowel. We will further assume that this valve is competent and does not yield. The entire force of the reversed peristalsis then is expended upon the cecum. Chronic constipation would have a similar effect. If, then, incompetency exists in twenty-nine per cent. of the cases, seventy-one per cent. are liable to suffer baneful effects from the lack of incompetency. This condition in a measure accounts for the large number of cases of typhlitis, paratyphlitis, and appendicitis. It certainly is not difficult to appreciate how an appendix chronically inflamed is practically in a state of stasis, has some foreign matter such as grape seeds forced into it, becomes incapable of expelling the foreign matter, and as a consequence becomes gangrenous. The very incompetency of the ileocecal valve could have prevented this.

In the transverse portion of the colon the contents are less fluid, they undergo a sort of to and fro movement, the liquid part is absorbed, and the residue is passed on into the descending portion. The transverse portion of the colon is especially liable to pathological conditions. Digestion, as far as the bowel is concerned, has been completed when the contents pass through the ileocecal valve. We know that the secretions of the large intestines are alkaline and rich in mucine, with no constituent

capable of acting chemically upon the three main groups of foodstuffs. All the chemical changes in the large intestines are caused by the intestinal bacteria. The reaction of the colonic contents are strongly acid. When the bacterial flora of the transverse colon produces a large amount of gas, distention is the result. As an immediate result of this gas formation by bacterial action the circulation of the blood in the wall of the bowel is impeded; consequently a lessened amount of mucus and neutralizing alkalis is produced. A more or less dry, chemically inflamed area is the result. From such an area absorption takes place that is not physiological. It is the absorption of toxic substances under such circumstances that is really responsible for the copremia in cases of constipation.

The descending portion of the colon and the sigmoid flexure are as closely related anatomically and physiologically as the cecum and the ascending portion. Under normal conditions, when the feces have attained a certain consistency, they are passed on and remain in the sigmoid flexure and do not descend into the rectum during the interval between one evacuation and the next. Defecation can be inhibited for a certain time by voluntary contraction of the external sphincter and the levator ani. By this mechanism it is possible, especially when often repeated, to postpone the act for some time, probably because the feces which have descended into the rectum are partly pushed back into the colon by the action of these muscles. The resultant effect is easily understood when the anatomy and the physiology of the large intestine are taken into consideration.

MUSCULATURE.

Since all of the muscles of the large bowel from the cecum to the sigmoid flexure are of the involuntary type it follows that their nerve supply is under the control of the sympathetic system. Along the anterolateral surface of the spinal column the ganglia of the sympathetic nervous system are situated. The ganglia correspond in number to the vertebræ. Those lying opposite the first to the fourth lumbar vertebræ give off branches which supply the various portions of the colonic area. It is a well recognized fact that the function of the nervous system is to control the blood supply to the organs and the tissue generally. In order to do this it is necessary that these ganglia receive stimuli from some organ requiring a change. A stimulus is produced by an injury, shock, or other pathological condition in some organ or tissue. If the response by the vasomotor system is adequate and the injury to the organ or tissue ceases, there is a repair and natural recovery—*vis medicatrix nature*. If the vasomotor response was inadequate or the injury to the organ or tissue continuous, not only does recovery not take place, but by the constant stimulus received by the sympathetic ganglia, they themselves become hypersensitive. The sympathetic ganglia, through the rami communicantes, are in contact with the posterior spinal or sensory nerve roots. This anatomical and physiological relationship between the organ and the tissue of the general and the sympathetic spinal system is of the utmost importance in the diagnosis of these lesions.

DIAGNOSIS.

Nearly all the symptoms that a patient with colonic pathology presents are of a reflex character. Very seldom do any of these reflex symptoms point to the site of the lesion. Colonic lesions usually present such symptoms as headache, neuralgia, neuritis, rheumatism (?), backache, indigestion, loss of appetite, gastric pain and discomfort one or two hours after eating, general malaise, irritability, coated tongue, vomiting, loss of weight, etc. Any one or all of these symptoms may be present in some degree, yet none point directly to the site of the lesion.

Spinal diagnosis.—A pad properly moistened is placed over the solar plexus, the patient resting upon the pad. The other, the examining electrode, is an ordinary sponge electrode and handle. The examining electrode is placed at the nape of the patient's neck; the current is turned on gradually from a high tension faradic coil until the patient is aware of the current or until muscular contractions are visible. The patient is instructed to note, as the sponge electrode is passed up and down the entire length of the spinal column, if there are any areas where the current seems to produce painful sensations. If the current is felt evenly along the entire length of the spine, the force of the current is increased so as to gain deeper penetration. If the colonic region is in a pathological state, the patient so examined will wince whenever the current passes through the nerves issuing between the first and the fourth lumbar vertebrae. Frequently a red spot or line will appear in this region, reaching from the first to the fourth lumbar vertebrae and as wide as the examining electrode. This red line is not constant, it depends upon the instability of the vasomotor system which varies in the individual. Whenever a red marking appears or when the patient describes the sensation to the faradic current as more painful than in other regions, it is an unfailing sign of some pathological condition of the colon. The diagnosis of colitis is thereby not only corroborated and confirmed but established as a reality.

THERAPEUTICS.

We are confronted with two conditions in the therapeutic procedure. One is the removal of the cause, the other, the abatement of the symptoms. The cause of the symptoms is a pathological condition of a part or perhaps the entire length of the colon. This pathological condition is a stasis, an inadequate attempt at repair of some injury. The real injury or the original cause of it may or may not be present. As a rule the original injury has subsided. It may have been anything from a *locus minoris resistentiae* to an actual trauma. Most frequently it is the result of dietetic errors aided by the formation of intestinal flora of the colon and other toxic acid forming bacilli.

The selection of a suitable diet under the existing circumstances is then of paramount importance. Individual conditions vary so greatly that it is impossible to lay down any specific rules. Each case must be treated according to the conditions present. While we are positive that toxic acid producing bacilli are present in the colon, we are equally positive that we have no drugs

or chemicals at our disposal that would destroy their activity or remove them *in toto*. Much study has been given to intestinal antiseptics, antitoxins, antiferments, etc. As a matter of fact, the whole process of digestion is one of fermentation brought about by enzymes; it is only when the splitting up process is carried on by certain acid producing bacilli that it becomes unphysiological. It is also a well recognized fact that bacilli resist chemical action longer and better than living enzymes. It naturally follows that any drug or chemical which possesses the power of inhibiting the bacillary activity in the colon will also interfere with the enzymotic action to the detriment of the patient. Intestinal antiseptics are a delusion and a snare. We have a means whereby we can rid the colon of injurious bacilli. If we administer the *Bacillus bulgaricus* (Metchnikoff) either in liquid or tablet form for a sufficiently long time, the putrid ferment forming bacilli will be displaced by a complete flora of lactic acid forming bacilli. Of course it is not the lactic acid which they form but the fact that the pathogenic bacilli do not thrive in a medium inhibited by the *Bacillus bulgaricus*. Lactic acid is comparatively harmless.

When the pathogenic germs have thus been removed we can turn our attention to the stasis of the colon. Diathermia is the agent that is capable of heating the internal organs to a degree to insure the production of an active arterial hyperemia. About thirty to forty-five minutes must be consumed either daily or on alternate days to change the stasis of the affected parts to an active interchange of the blood current. The patient is seated in an autocondensation chair, the other pole is attached to a metallic electrode of flexible tin which is applied over the region of the colon. If measured by a Wappler hot wire meter the reading should show about 2,000 milliamperes. About six to eight weeks are required to treat the average case of typhlitis, chronic appendicitis, colitis, or sigmoiditis. The three measures, suitable diet, *Bacillus bulgaricus*, and diathermia will remove the local manifestations. Without the removal of the local cause no cure can be expected in the reflex or secondary symptoms.

REFLEX SYMPTOMS.

There is no disease condition with which I am familiar that can show so many and so varied a set of reflex symptoms. There is hardly any need of calling attention to the individual reflex symptoms. There is one cause which, however, deserves especial mention, that of acidosis.

Acidosis.—"By acidosis is meant such an increased amount of acetone in the urine as to cause a disturbance of the equilibrium of the metabolic processes of the body, thereby causing definite symptoms, often even of a serious nature" (1). The increase of acetone and diacetic acid or acetone bodies in the urine causes no metabolic disturbances, but the fact that they are present in the urine shows that these same constituents have been present in the blood. It is the acidemia that is responsible for the various symptoms of acidosis. The theories as to how this excess of acid gains entrance to the circulatory blood are too many for our considera-

tion at this time. I will call attention to only one route. In cases of colitis we have as a rule more or less gaseous distention of some part of the colon. This distention, aside from the anatomical and physiological disturbance which it causes, allows the acid fluids of the pathological colon to be absorbed into the general system. The contents of the normal colon should be alkaline. If they are acid it is due to the action of pathogenic germs. The normal stool should be alkaline, well formed, and covered with mucus. Since the contents of the ascending and the transverse colon are normally in a fluid state and since the normal stool is well formed what has become of the fluid? It must have been absorbed by the colon. The absorption of the fluid from the colon is perfectly physiological, but this fluid, like the normal blood, must be alkaline. There are perhaps many other ways in which an acidosis may be produced, but for our purpose in colitis this one is sufficient. The general symptomatology is too well known to require repetition here.

After the immediate cause has been removed the administration of equal parts of sodium bicarbonate and sodium citrate at least neutralizes the otherwise harmful effects. The bowels must be emptied daily; better than the routine administration of cathartics is the regular use of the soap and water enema. The best results are obtained by the hydroelectric douche. The positive galvanic current is used with a large pad over the abdomen, the negative is attached to hydroelectric douche. The negative current in the sigmoid flexure stimulates alkaline and mucus secretions in the colon; the former neutralizes the existing acidity, the latter coats the stool, favors expulsion, and protects the inner surface of the bowel.

Colitis is difficult to diagnose, it is a complicated condition to treat, but once properly appreciated it is very amenable to correct therapy.

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301 WEST NINETY-FIRST STREET.

GAUCHER'S DISEASE.*

By MARK S. REUBEN, M. D.,

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I have already (1) reported a case of splenomegaly Gaucher in a child four years old. In March, 1912, splenectomy was performed on this patient. The child did not survive the operation. Histological study of the liver, the spleen, the lymph glands, and the bone marrow confirmed the diagnosis previously made on a clinical basis. This was the first case to be reported in the English language in which the diagnosis in a child was made prior to operation or necropsy and was confirmed later. The diagnosis was correctly made in a child only once before by De Jong and Van Heukelow in 1909. The object of this paper is to report another case of this disease in which the diagnosis was made prior to operation and which was substantiated by histological

examination of splenic tissue obtained by splenic puncture.

CASE I.—Harry H., two years old, came to my notice in the pediatric department of the Vanderbilt Clinic on May 19, 1917; he was brought to the clinic for abdominal enlargement and general physical backwardness; the patient at two years of age could neither walk nor stand unsupported. The family history was negative; there was no evidence of tuberculosis or lues in the family; the parents were related (second cousins). There was no history of miscarriages and there was but one other child in the family, a girl four years old. The patient was born at full term; labor was easy; birth weight about seven pounds. He was breast fed for sixteen months, and was then put on a diet suitable for his age. The bowels were always regular and there was no history of vomiting except during the first few months of infancy; the abdominal enlargement was noted at six months and it was thought to be due to gas; he began to talk at sixteen months; the first teeth appeared at ten months. He had chicken pox at eighteen months, but no other acute infectious disease. The patient was subject to frequent attacks of bronchitis and tonsillitis. At four months a hydrocele developed which disappeared without treatment. At one year he had a severe, spontaneous epistaxis, which lasted two to three hours before it could be stopped; no history of any other hemorrhages.

Physical examination showed the face and hands distinctly tinted yellow or Roman gold color, the light tan of sunburn; nutrition was good; his head was somewhat small for his age; the fontanelles were closed; epiphyses not enlarged; the lower extremities markedly hypotonic; no bowing; the skin was dry and of peculiar lemon yellow color (no jaundice); the conjunctivæ normal (no pinguecula). The axillary, epitrochlear, and inguinal lymph glands were not enlarged; cervical and submaxillary glands were somewhat enlarged—probably due to enlarged tonsils and adenoids. The tongue was normal; he had sixteen teeth. The heart and lungs were negative. The abdomen was markedly enlarged; diameter, twenty-three inches. There was no evidence of fluid. The spleen was enormously enlarged; it occupied the whole left side of the abdomen and extended to the pelvis and beyond the median line; the indurated edge and notch could be distinctly felt; the spleen was of hard consistence. The liver was enlarged, but not quite as large in proportion as the spleen; the right lobe was more enlarged than the left and extended to the pelvis; the left lobe could be felt at the level of the umbilicus. Mentality was normal for the age. He weighed twenty-four pounds six ounces stripped. The dimensions were as follows: Height, thirty-one inches; circumference of head, seventeen and three quarter inches; of chest, nineteen inches; of abdomen, twenty-three inches. No evidence of rickets was present. The blood examination was as follows: Hemoglobin, fifty-five per cent.; red blood cells, 3,500,000; white blood cells, 4,500; differential count, normal—forty-four polynuclears, fifty-five lymphocytes, no abnormal cells. The Wassermann and the Pirquet reactions were negative. A tentative diagnosis of Gaucher's disease was made on the first visit. As the disease is usually familial, the mother was requested to bring the other child for examination. As the examination of the girl revealed that she too had a large spleen and liver, consent for splenic puncture was requested and obtained. The splenic puncture on the boy was carried out under strictly aseptic precautions on May 26th. Not the slightest ill effects of the puncture were noted, although the child was seen every day for several days after it was carried out. Enough material was obtained to make four smears. Two slides examined by the writer showed the characteristic endothelial cells; the other two slides were examined by Doctor Bernstein, of the pathological staff of Mt. Sinai Hospital, and he confirmed our findings. Under treatment with iron and arsenic the blood picture has improved, but the splenic enlargement continues; splenectomy has been advised and consent has been obtained and will soon be carried out.

CASE II.—Sarah H., four years old, sister of the above patient. Delivery was instrumental; breast fed for thirteen months; chicken pox at three years; no other acute infectious disease. She had never had any illness except an occasional spoiled stomach, and there was no history of any hemorrhages. Physical examination showed her color

*Read before the Connecticut State Medical Society, October 3, 1916.

to be a peculiar yellow; nutrition was good; there were no glandular enlargements; heart and lungs were negative; conjunctivæ normal; tonsils enlarged; adenoids present. Abdomen slightly enlarged; the spleen two and one half fingers below costal margin; the liver two fingers below costal margin; the child did not complain of anything, and these findings were found in a routine examination of the child. The blood examination was as follows: Hemoglobin, eighty-five per cent; red blood cells, 4,200,000; white blood cells, 7,200; no abnormal cells were present. The Wassermann and the Pirquet reactions were negative.

Historical.—In 1882, in a thesis for his doctor's degree, Gaucher reported the first case of the disease which now bears his name. He considered the malady to be a primary epithelioma of the spleen. In all there are sixteen authentic families reported in the literature in which the diagnosis was definitely established; of these patients eight were children and nine were adults at the time of report. Various opinions have been expressed as to the nature of the disease; as yet there is very little agreement of opinion.

Etiology.—The disease is undoubtedly congenital and usually affects more than one member in the same family; although it is familial, it is not hereditary. Of the eight patients in whom the diagnosis was definitely established, six were females and two were males. The youngest child reported was seventeen months old; the earliest splenic enlargement was noted in one case at two months.

Pathology.—In five of the eight authentic cases necropsies were performed and in three the spleens were examined after operation; in two, splenic tissue obtained by splenic puncture was examined. In the ten examinations of the spleens, the findings were almost identical in all the cases. Bovaird was the first to note similar changes in the mesenteric glands, and Mandlebaum and Libman were first to find the endothelial hyperplasia in the bronchial and the retroperitoneal glands and in the bone marrow. The appearance of the cut section of the spleen varies. A central section shows firm yellow white areas of pyramidal form; the remainder has the appearance of normal spleen. Sections from hard white areas differ from other sections that have the appearance of normal splenic tissue. In the latter sections there are large irregular spaces filled with large, brightly stained cells. The walls of these spaces consist in part of a delicate line of connective tissue with infrequent small oval nuclei; adjoining spaces communicate with one another by narrow passages. The cells within the spaces are very large and are of varied shape; many lie free in the spaces; these cells are round or oval. The nuclei vary considerably in size and shape; as a rule they are very small in proportion to the size of the cell. There are also in some places giant cells; the malpighian bodies are almost unchanged. Sections from the white areas consist of dense connective tissue.

Symptomatology.—One of the first symptoms and signs noted by the parents and the patients is a mass in the left hypochondrium; this mass is not tender. There is a gradual but progressive enlargement of the spleen. The increase in size of the spleen in this disease is not surpassed by splenomyelogenous leucemia; one obtains a better idea of how large the spleen may become in this disease when we note that in Collier's case the child weighed

twenty-three pounds, and the spleen weighed four pounds, two ounces. In all cases there is a concomitant enlargement of the liver; in some cases, the liver increases in size proportionately to the spleen; in others it is only slightly enlarged. The lymph nodes are usually normal.

The blood usually shows a mild anemia which varies from time to time and is subject to various grades of improvement; only in the later stages of the disease does it become progressive. The white blood cells are usually diminished in number, even when the red blood cells are not. A persistent leucopenia in the absence of anemia is a very suggestive symptom. The hemoglobin varies with the anemia; usually there is a greater reduction in the hemoglobin content than in the number of the red blood cells, giving rise to a low color index and therefore to a mild anemia of the chlorotic type. The differential count is normal. Abdominal pain, especially over the splenic area, fullness, and dragging sensation were noted in nearly all the cases. The pigmentation has been variously described varying from a brownish bronzing and Roman gold color to yellow, light yellow icteric hue; the pigmentation is seldom diffuse and usually affects the neck, the face, the extremities, the bridge of the nose, around the eyes and the cheeks. A brown yellow, wedge shaped, thickening of the conjunctivæ of both eyes was observed in several cases. Hemorrhages as a rule are not severe and are usually in the form of epistaxis or oozing from the gums. Jaundice is never present; bile is not present in the urine and urobilinuria is not increased to any appreciable extent. As the spleen and the liver become larger the children begin to complain more and more of abdominal pain, general discomfort, weariness and dyspnea. As the disease progresses, and the anemia becomes more marked, emaciation becomes extreme.

Course of the disease.—In infants and young children the disease is slowly progressive with a certain number of remissions. The younger the child is when the first splenic enlargement appears, the graver is the prognosis. This disease does not run so benign a course as it does in adults. Adults on the average live about nineteen years after they have contracted this disease and may live as long as thirty-six years after its inception. Adults afflicted with this disease usually die of some intercurrent affection. Infants and children, on the contrary, usually die of asthenia or rupture of the spleen brought about by the disease itself. In the fourteen cases reported, seven patients died, five of the disease itself and two after splenectomy. The prognosis in children is far graver than it is in the adult type of the disease, unless splenectomy is performed early. There are not sufficient data at hand to prove or disprove that splenectomy brings about a cure. Of the five cases in which splenectomy was performed, in two the patients died immediately after operation, and in the three patients who survived, the hepatic enlargement progressed after the splenectomy. Certainly splenectomy produces no such wonders in this disease as it does in Banti's disease and in splenic anemia. It relieves all the symptoms, but whether it produces a cure we have

not sufficient data, pro or con. The three cases in which the patients survived splenectomy have not been observed sufficiently long to draw any definite conclusions from them. The pathologist must also tell us whether the lesion begins in the spleen and then spreads to the other blood forming organs, or whether the power for the disease to progress lies latent in the other organs, and may become active even when the spleen is removed. Definite knowledge on this point is lacking. There is no agreement of opinion among the pathologists on this point. Some assert that the spleen is the primary seat of the disease and that the large cells in the course of the disease are transported to the other blood making organs and there proliferate. In accordance with this view an early splenectomy should result in a cure. Others maintain that although the spleen is the first of the hematopoietic organs to show activity in this disease, the other blood forming organs have the power latent in them from birth to become active and may cause enlargement of the liver, even after the spleen is removed. According to this view, splenectomy cannot stop the progress of the disease; it can only relieve the symptoms due to the size and the weight of the spleen. In the progressive cases of infants and children, however, splenectomy is the only measure to be thought of for the temporary relief, if not for the cure of the disease, as the size of the spleen may be a direct menace to life on account of the danger of rupture. All other measures are futile.

Diagnosis.—This disease is not a manifestation of tuberculosis or syphilis. In the stage of prehepatic enlargement, the following points are important: the familial nature of the disease; persistent leucopenia, even in absence of anemia; progressive enlargement of the spleen in spite of the improvement of the anemia, if present, is almost pathognomonic; the conjunctival thickenings; the absence of all etiological factors; the absence of jaundice, ascites, urobilinuria and fever, and splenic puncture. This procedure is hardly ever used in the United States; in Italy, especially Florence, where it has been extensively tried, very few untoward complications have been observed from its use. As in very young children and in infants this disease is almost invariably fatal, a splenic puncture for diagnostic purposes should be performed in every case in which this disease is suspected. If examination of this material reveals it to be a case of Gaucher's disease, splenectomy should be urgently recommended, for it is these cases without hepatic enlargement that offer the best hope of permanent relief and cure of this disease.

In the stage in which both the spleen and the liver are enlarged, the diagnosis can more readily be made. There is no other disease of infancy and early childhood in which the liver and the spleen assume such enormous proportions, splenomyelogenous leucemia not excluded. This disease runs an afebrile course except in its terminal stage. Here too the other symptoms are of great importance in arriving at a correct diagnosis: the familial predisposition; the persistent leucopenia; the conjunctival thickenings; absence of jaundice, ascites, and urobilinuria; the presence of a brown yellow pig-

mentation, especially on the face, neck, extremities, and the abdomen; the presence of often repeated but slight hemorrhages, mostly in form of epistaxis and oozing from the gums, which are usually spongy; the absence of all symptoms when anemia is not present, in spite of an immense liver and spleen; the progressive enlargement of the spleen and the liver, in the anemic stage, even when the anemia under treatment is rapidly disappearing; the absence of all glandular enlargement, and finally splenic puncture.

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316 WEST NINETY-FOURTH STREET.

MYOMA OF INTESTINES.

Report of a Case.

By FREDERICK CHRISTOPHER, S. B., M. D.,
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The infrequent occurrence of myomata of the intestine and the important rôle which such tumors occasionally may assume, seem to warrant the reporting of a case in which, during the course of a

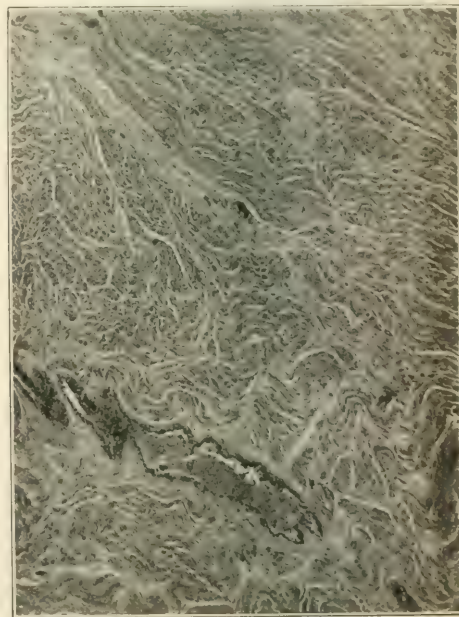


FIG.—Microphotograph of section of the tumor.

gynecological operation, an intestinal myoma was discovered and excised. In his analysis of 119 cases of benign tumors of the intestines, King (1) found the proportion to be: Myoma, forty-five; lipoma, twenty-nine; adenoma, seventeen; fibroma, fourteen; angioma, three; fibromyxoma, three; neuro-

fibroma, three; teratoma, two; fibroadenoma, two; rhabdomyoma, one. The importance of these growths is better appreciated when we learn that one fifth of the cases of intussusception in adults collected by Eliot and Corcaden (2) were associated with benign tumors.

Myomata of the intestine have been studied very carefully by Steiner (3) who analyzed fifty-one cases. In forty-one per cent. of these cases the myomata were attached to the stomach and in fifty-nine per cent. they were about equally divided between the large and the small intestine. The age varied from seventeen years to eighty years and there was considerable probability that in some of the patients the myomata were congenital. The tumors varied in size from one centimetre to thirty by forty centimetres and weighed as much as seven kilograms. The intestinal obstruction which occurred with some of the intrainstestinal tumors was not infrequently of the intermittent type, while that associated with the external myomata generally was acute.

The origin of these tumors is uncertain. Many believe congenital cell rests to be the starting point, while others attribute the growth to inflammatory stimuli. Proliferation of the endothelium of the serosa, etc., has been mentioned (4). King (1) considers that reported cases of myomata and fibromata are those that arose from the muscularis, "as there is slight possibility of any of them having originated from the muscularis mucosa."

CASE.—Anna S., twenty-eight years old; married; Hebrew. Since the birth of her only child at a normal delivery thirteen months before admission, the patient suffered from pain on both sides of her abdomen and a small amount of yellowish vaginal discharge. She had never been sick otherwise. Family history was irrelevant. Menses were regular. Physical examination was negative save for fixed pupils, impairment of left apex, relaxed perineum, and retroversion of a small uterus. Wassermann reaction in the blood was positive. Urinalysis was negative. Diagnoses of chronic appendicitis, retroversion of uterus, chronic pulmonary tuberculosis, and syphilis were made. Operation on February 27, 1917, was performed by Dr. Eugene H. Pool. Appendectomy for chronic appendicitis and a Gilliam suspension were done in the usual manner. During the course of the operation a nodule some three centimetres in diameter was noticed attached by a pedicle 2.5 centimetres long by about 0.8 centimetres in diameter to the anterior aspect of the sigmoid flexure. This nodule appeared yellow white and seemed to have a thick wall. It was removed and sent to the pathological laboratory for examination. The patient was discharged, improved, fifteen days after operation.

The pathologist reported a degenerated myoma of the intestine. He observed that the specimen consisted of an encapsulated tumor the size of a lime that was removed from the sigmoid flexure of the colon. The capsule was thin but dense. The interior of the tumor was composed of a tissue the consistence and general appearance of uterine muscle, though somewhat softer than the latter. The section of the tumor showed it to be a myoma. All parts of the section showed evidences of degeneration, the peripheral zone being more markedly affected than the central parts. Numerous collections of hematoidin crystals were found in the central part of the tumor.

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A NOTE ON AMAUROTIC FAMILY IDIOCY.

By JULIAN W. BRANDEIS, M. D.,
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In an article on Amaurotic Family Idiocy, by Dr. J. Epstein (1), the following statement occurs: "The parents of the infants of Cases I and II are first cousins, and the consanguinity probably has some etiological influence, but it is difficult to understand why the sixth and seventh child only in this family suffered."

Amaurotic family idiocy is a recessive condition, and as such the consanguinity is of great importance and the fact that but two out of seven children have been afflicted is the reasonable Mendelian expectation. Each one of the parents carried latent within himself or herself the factor for producing the disease, inherited from members of the same ancestry. In fertilization, a spermatozoa carrying the recessive factor meeting an ovum bearing the same factor, an individual was produced pure for the recessive condition, and therefore exhibiting the disease. The accompanying chart represents the

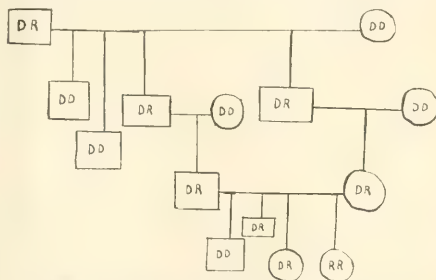


FIG.—Diagram representing the family tree of the family in Epstein's case of amaurotic family idiocy.

family tree of this family. If the law of segregation, as enunciated by Mendel, is kept in mind, the occurrence of two cases of idiocy among seven—it should be eight—is seen to be the natural expectation. This law states that although an individual may harbor within himself the factor for producing both the dominant and the recessive conditions—DR—when it comes to the formation of germ cells the factors segregate; half of the germ cells may contain the factor for producing the dominant condition and half may contain the factor for producing the recessive condition, but no germ cell can contain both factors. Thus:

DD with RR gives all DR.
DR with RR gives 1 DR and 1 RR.
DR with DD gives 1 DD and 1 DR.
DR with DR gives 1 DD, 2 DR, 1 RR.
DD with DD gives all DD.
RR with RR gives all RR.

remembered that the pure dominants, DD, and the impure or heterozygous dominants, DR, both exhibit the dominant condition—in this case, appear as normal. Only the pure recessive, RR, presents to the view the picture of the malady.

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156 WEST 121ST STREET.

Medicine and Surgery in the Army and Navy

TRENCH DISEASES.

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(Continued from page 75.)

TRENCH NEPHRITIS.

Description.—So long as the armies were shifting back and forth, making long gains in either direction, there was only the usual amount of nephritis always to be found among large bodies of men, but as soon as both armies had dug themselves in for good a large number of cases of acute nephritis of no obvious etiology came to the attention of the surgeons. Those interested in medical history at once recalled that a similar situation occurred in the Civil War, but not since. Acute nephritis in the troops was rare in the Franco-Prussian War, the Chino-Japanese War, the Spanish-American War, the English conflicts in the Soudan, the Russo-Japanese War and the Boer War. Casting about for a reason, it was recalled that in 1863 the dash of the armies of the Confederacy northward was checked at Gettysburg, and a prolonged trench warfare followed, resembling in many particulars present day trench warfare. In civil life acute nephritis is not common. Langdon Brown states that while there are 70,000 medical cases admitted to St. Bartholomew's Hospital every year, there have been only 166 cases of acute nephritis in nine years, or one thirty-eighth of one per cent. Trench nephritis, as at present understood, is a transient albuminuria of unknown origin, showing chiefly edema and dyspnea, going on usually to recovery, but occasionally to a chronic condition, and rarely to death; and showing pathologically a proliferation of the epithelium of the capsules of the glomeruli, a degeneration and desquamation of the epithelium of the tubules, and cellular infiltration of the interstitial tissues.

Etiology.—The one word "unknown" might be written in discussing the etiology, and no one could question it. This indeed is the conclusion of Sundall and Nankivell, after reviewing all existing theories in a recent article. It is known, however, that the exacting conditions of trench warfare, the exposure, the fatigue, the lack of exercise, the cold, and perhaps something in the food, have been responsible for these cases, which have occurred in all the classes and services except among the Indian troops (Bradford). It was thought at first that exposure played a prominent part, but Bradford calls attention to the fact that there were very few cases until March and April, 1915, although all the troops were subjected to severe exposure before that time. Langdon Brown expresses the same views, and calls attention to the fact that there has been quite as much exposure of the troops in former wars, but practically no nephritis. McLeod and Ameuille, who examined the kidney function in large numbers of healthy men and tested the effects of exposure, faulty diet, and slight infections, came to the con-

clusion that exposure has little or nothing to do with it. Many observers have concluded that trench nephritis is of infectious origin. Langdon Brown says that an infectious process is indicated by analogy and by the fact that the distribution is glomerulotubular. Raw, Dixon, Moorhead, and Rowlette all believe it is infectious in origin. McLeod and Ameuille, after discussing all other hypotheses, came to the conclusion that the following was probably the explanation: The kidney, in common with the other organs of the body, has its resistance lowered by a slightly scorbutic condition, and gives out when in addition to this it is required to make an excessive metabolic effort, owing to high protein diet, or is exposed to bacterial intoxication, either by direct invasion or by the establishment of an infective focus in some other part of the body. Chandler, commenting on these conclusions, says that as a rule there is no lack of vegetable food for the troops, hence no scorbutus. He thinks the origin is infective. Auld, who has tested many cases with phenolsulphonaphthalein, also believes that an infection is responsible. Langdon Brown speaks of several etiological theories: the water supply has been blamed, but this has not been proved; some investigators have laid the disorder at the door of excessive protein diet, causing intestinal toxemia, but Mackenzie Wallis has found ethereal sulphates markedly diminished, thus negating intestinal toxemia. Clarke found a previous severe infection in most of his cases. Acidosis has been mentioned, but not proved. Dysentery, typhoid, alcoholism, and malingering by the deliberate ingestion of cantharides and chromic acid have all been suggested, but they explain only a moiety of cases.

Three suggested causes deserve passing mention: White found lead in the urine in four cases and suggests that the disorder may be due to the large consumption of canned foods. Four of Clarke's cases were either painters or plumbers before the war. Chapple says that it is well known that large doses of potassium chlorate produce hematuria with blood casts and diminished secretion of urine, many of the tubules being filled with plugs of blood (Lander Brunton). He suggests that the common practice of using calcium hypochlorite in sterilizing trench water may be responsible for trench nephritis. Bull, in a recent article, says he has been able to confirm this from personal observations. Klein and Pulay have found colon bacilli in the urine and think the cause may lie here.

Pathology.—Urinary analysis shows an albuminuria varying from a trace to 0.3 per cent. (Mackenzie Wallis), the diastatic output is low, and hyaline casts are practically constant. Granular, fatty, and blood casts also occur. The ethereal sulphates are markedly diminished and the urine is very toxic. Colon bacilli have been found in the urine (Klein and Pulay). Langdon Brown, it may be mentioned, states that the urine is sterile and variable in quantity and shows a picture of subacute diffuse nephritis. According to Pick, Sundell, and Nankivell the nephritis is focal and not diffuse. The renal permea-

bility has been tested by Tremolières and Caussade in France and J. Trevan in England by three methods: 1, indigo carmine; 2, elimination of chlorides; 3, estimation of the urea in the blood. Their results will be given under Symptomatology below. Osler says the picture is simply one of acute nephritis, and Andrewes agrees with this. Clarke states that a post mortem of one of his cases showed that the disorder was a diffuse nephritis, affecting chiefly the convoluted tubules.

Londek states that the kidneys are azotemic, that N and NaCl were dealt with in an antagonistic sense, that is, that N is not managed while NaCl is properly excreted, and *vice versa*. The kidneys may be restored to function even while albuminuria, hematuria, and cylinduria persist. Davies and Weldon concluded from a number of autopsies that only one portion of the renal unit bore the brunt of the disease, that is, the convoluted tubules, and they decided that these tubules are damaged in excreting a soluble poison, which may or may not be bacterial. Cases which have come to autopsy show, according to F. W. Andrewes, changes in the glomeruli, tubules, and interstitial tissue. There is proliferation of the epithelium of the capsules of the glomeruli, and degeneration and desquamation of the epithelium of the tubules. Fatty changes are slight or absent. There is a cellular infiltration of the interstitial tissue, chiefly by leucocytes; plasma cells are absent. All in all the changes observed resemble the acute glomerular nephritis of scarlet fever.

Symptomatology.—Tremolières and Caussade describe three kinds of cases: 1, Cases where the onset is insidious comprising about one third of all cases. The kidneys show a normal permeability, the albuminuria being the only symptom. In one third of these cases it disappears gradually; in two thirds it remains in some degree. These patients can be returned to duty. 2, Cases with an acute onset, comprising about three fifths of all cases. In three fourths of these cases there is an increased elimination of indigo carmine with retention of chlorides. Edema and hematuria may be present at first, but the picture gradually changes to one of simple albuminuria. In one fourth of these cases the condition is more serious: these are usually in men over thirty years of age and cramps and "dead fingers" are common. The elimination of indigo carmine is diminished, there is retention of chlorides, and the urea in the blood is increased. Some of these cases may be returned to duty if the heart is normal and the blood pressure not over 170 to 180 millimetres. 3, Those cases, comprising about seven per cent. of the total, which quickly merge into chronic nephritis. There is cardiac hypertrophy, gallop rhythm, accentuation of the second sound at the base of the aorta, and rise of the arterial tension. These cases are unfit for duty, and indeed may terminate fatally.

Practically all writers on the subject speak of localized edema, rapidly subsiding, and dyspnea. Bradford gives five cardinal symptoms: 1, well marked renal dropsy, rapidly subsiding; 2, the frequent presence of bronchitis and dyspnea; 3, the severe and sudden onset of uremic symptoms; 4, the rarity of inflammatory complications; 5, the ex-

tremely low mortality, 0.3 to 0.4 per cent. Osler comments on the transient edema, with the great improvement following, and the unusually prominent dyspnea.

Clarke, who has made an intensive study of seventy-four cases, says that the chief symptoms are edema and dyspnea, the latter often, but not always, associated with some bronchial condition. The heart showed a ringing or accentuated aortic second sound, with occasionally a systolic murmur or reduplicated first sound of the apex. Abercrombie, who has seen over 500 cases, says premonitory symptoms occur in one half the cases and are bronchitis, pain in the back and limbs, abdominal pains, and vomiting; the most constant symptoms, he says, are headache and dyspnea, convulsions occur in three per cent., mania in 0.8 per cent., amaurosis in 0.6 per cent. Sundell and Nankivell report uremia in eight per cent. of their cases. They also report enlargement of the spleen and granular mucous membrane in the trachea. Langdon Brown says the edema is almost constant and sometimes curiously localized, dyspnea is frequent; there is a slight and irregular fever in the early stages; convulsions occur in seven per cent. of all cases, and a rare and probably serious symptom is milkiness of the blood serum. Dixon has not observed cardiac changes and says the relation of the temperature to the albuminuria is variable. Bradford says there is no nephritic facies; the albuminuria is considerable in the acute stages and persists longer than the edema; epileptiform seizures are not rare; bronchitis occurs in about thirty per cent., and no changes in the fundus oculi have been found in those cases where the eyes were examined. He says that uremic symptoms are common and always occur in fatal cases, among them ammoniacal odor, apathy, drowsiness, headache, nausea, and sometimes vomiting, twitchings, cramps, and skin eruptions have been observed.

Diagnosis.—The diagnosis is fairly easy, and if the urine of every ill soldier is tested, will never be overlooked. An acute nephritis, with transient edema, headache, and marked dyspnea, coming on in a previously healthy soldier who has served in the trenches, at once arouses suspicion, which is confirmed by the uranalysis.

Prognosis.—The prognosis is good for recovery although relapse may occur. The average duration is two to three weeks (Clarke). About seventy-five to eighty per cent. of all patients may be returned to duty, about fifteen to twenty per cent. become chronic, and from 0.5 to one per cent. die. Sundell and Nankivell had seven deaths in 250 cases, or 2.8 per cent. This is the French estimate (Tremolières and Caussade). Davies and Weldon give four per cent. A recent English war order (March, 1917) directs that all nephritics must spend at least three months in the hospital; if they are then free from albumin they are put on home service only. Any soldiers over thirty-eight years of age with cardiovascular changes and persistent albuminuria are invalided out. Soldiers with persistent albuminuria, but no cardiovascular changes, are retained in a class not higher than C 3.

Bradford reports a mortality of only three in 571, or 0.5 per cent.; in one of these cases chronic

Bright's disease was found and in the other two congenital defects of the kidney. Osler gives the mortality as from one to two per cent, and speaks of the danger of chronic nephritis. Davies and Weldon say that pulmonary complications and uremia are the principal causes of a fatal issue. Bruno says there is a marked tendency to relapses which duplicate the original attack, but no tendency to chronicity.

Treatment.—The great point which the English have learned by sad experience in the treatment of trench nephritis is to keep the cases under treatment for a long time; three months in the hospital is advised as a minimum. The treatment is otherwise the same as that of acute nephritis in civil life; Langdon Brown lays special stress on a diet poor in nitrogen. Sundell and Nankivell say that diuretics and diaphoretics apparently had no value. A rigid milk diet for the first few days, continued after that if there were uremic symptoms, was advised. Opium proved beneficial when uremia was present. Clarke recommends rest in bed always until either the albuminuria or the casts have cleared up. The daily diet he gives his patients at first is: milk, two and a half pints; bread, six ounces; rice, one ounce; butter, half ounce, and fruit occasionally. As improvement took place the bread was increased to eight ounces and the yolks of one or two eggs were added; later on, four ounces of fish or chicken were added and perhaps more bread and butter. Salt was not used except in cooking greens. As to medication, most of Clarke's patients had only a simple diaphoretic mixture with other drugs as indicated. The sodium carbonate treatment, suggested by Dr. Martin H. Fischer, gave great success in Clarke's hands, except in a few cases where it failed rather inexplicably.

(To be continued.)

ITALIAN MEDICAL ACTIVITIES IN THE WAR.*

By VICTOR G. HEISER, M. D.,

New York,

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American Red Cross Commission to Italy.

It was generally understood, Doctor Heiser stated, that the Italian Army consisted of at least 4,000,000 men and that the number of hospital beds was approximately 1,000,000. Just what it meant in two years to expand a country's hospital service to these huge proportions could be better appreciated when it was recalled that in the entire United States, with a population almost three times as great as that of Italy, there were only 300,000 beds. In spite of this vast achievement, the work accomplished by the Italian medical profession since the beginning of the war had attracted but little attention in this country.

While probably none of the Allies fighting in Europe had received less aid other than financial help from outside their own borders, the medical men of Italy almost invariably were loath to speak of their achievements. It was characteristic of the Italian

medical service to achieve results and then perhaps talk about them. The equipment for the care of the sick and wounded had been provided almost entirely in Italy. Mobile hospitals of 100 bed capacity, which could be taken down, transferred seventy-five miles, set up, and put in service again within twenty-four hours, were in use, the entire equipment being transported on five camions, or motor trucks, and three touring cars. New operations, particularly in dental and lung surgery, and new instruments without number had been developed. The Italian medical service was presided over by an official who had his office with the Minister for War at Rome. Under the chief medical officer there was stationed with each army a principal medical officer who had almost determining powers in directing the medical work of the army with which he was stationed. The care of the wounded was undertaken jointly by the Italian Red Cross and the Sanitare Militare, or Army Medical Service, medical aid being rendered through the following seven agencies: 1. The *posti medicazione*, or the most advanced dressing stations for emergency service, were located usually in dug-outs in trenches very close to the front. 2. The *sezione sanita*, located one or two kilometres behind the front, were dispensaries and more fully equipped than the preceding. 3. *Ambulancia di montagna*, were located from two to five kilometres behind the front, the most advanced point reached by the Italian Red Cross. 4. The *stazione di sanita* were somewhat larger and better equipped than the *ambulancia di montagna*. 5. The *ospedale di campo*, or field hospitals, were at accessible points somewhat farther back; they were of 500 bed capacity and were used also as distributing centres where cases were classified and sent to various special hospitals. 6. *Ospedale di tappa* were base hospitals several hundred kilometres behind the lines with a bed capacity of from 20,000 to 40,000. 7. *Ospedale di riserva* were institutions throughout the cities of Italy which had been made available for soldiers.

For each army there were a number of large quarantine stations provided with steam disinfecting apparatus or sulphur dioxide chambers. Every patient before admission to the general hospitals and all prisoners were passed through stations of this kind. Hospitals afforded by the Italian Red Cross consisted largely of tourist hotels, schools, and other buildings adapted to the purpose; those provided by the medical service consisted of existing army hospitals, military buildings, or entirely new structures. The latter were usually one story pavilions about fourteen feet high, eighteen feet wide, and of any desired length, constructed of angle iron placed on six foot centres, with the intervening space filled in with hollow tile resembling that used in fireproof construction in this country. The roofs were also of tile. They were cheaper than tentage, were cool in summer, and could be kept warm in winter. The decreased use of cavalry had made available large numbers of cavalry barracks. In one of these at Udine a single ward had 300 beds. Hospitals were being located nearer and nearer the front and in most unusual places. Thirty or forty feet under ground and directly under a point where a battle was raging it was a novel experience to see

*Abstract of a paper read before the College of Physicians of Philadelphia, January 2, 1918.

the hospital routine in good operating rooms and wards supplied with artificial ventilation and modern hospital equipment. On the other extreme, at an elevation of 6,000 feet in the Dolomites we came upon a thirty bed hospital hewn out of the side of a cliff. The two sides and back wall were of stone and the mountain range at this point was so narrow that through a hole bored in the back wall of the hospital it was possible to look into the Austrian trenches on the other side of the mountain. After receiving emergency treatment patients were sent to the rail head on the marvelous *teleferica*, which often go from mountain top to mountain top over chasms thousands of feet deep.

Specialization has been carried to a high degree; at Udine we saw 1,500 fracture cases in a single hospital; at other hospitals we saw only gunshot wounds of the chest. Professor Morelli had invented an improved aspirator for draining fluid from the chest. Pressure within and without the lungs could be accurately read on a gauge and through the development of special technic, which among other things permitted the lungs to remain collapsed during definite periods, he had been able to produce some startling results in lung surgery. In 100 recently completed cases there had been no mortality and Professor Morelli believed it entirely feasible to keep the mortality well under five per cent. in all gunshot wounds of the chest.

Practically every hospital throughout Italy had one or more x ray machines, all manufactured in their own country. The smooth organization of the hospital train service was one of the most striking features which we saw in Italy. Often we saw a train back into a side track next to a hospital, take on board fully 350 wounded, and in less than thirty minutes proceed on its way. Everything worked with clocklike precision. One was particularly impressed by the amount of new apparatus invented to meet the needs of war cripples and almost unbelievable progress had been made in appliances and methods for the reeducation of lost functions. Great stress was laid upon specialized forms of physical drill for rehabilitating nerve function and remarkable results were shown us. Doctor Guali at the Villa Fiore had devised excellent improvements in artificial limbs; also a clever apparatus for registering the pressure of the artificial foot. At other institutions a trade suitable to the individual patient was taught. Italy had established huge stations for the return of her soldiers from Saloniki and Albania. In view of 100,000 cases of malaria invalidated back, the importance of such quarantine stations was manifest. A comparatively small amount of tuberculosis has been encountered in the Italian army, but it was said that 30,000 tuberculous Italian prisoners had been returned from Austria. The x ray diagnosis was a routine procedure.

Among other activities with which the medical service was associated was an active reclamation department which provided for the collection and repair of articles left on the battlefield. The very general employment of huge fireless cookers assured to the soldier absolutely hot meals in whatever position he is. Huge shops for repairing those cookers form part of the system. The prison camps at the

front consisted of barbed wire enclosures with good tents and excellent cooking arrangements. They were divided into three sections. In the first the prisoners were bathed and their clothing disinfected; in the second, stools specimens were taken for cholera, dysentery, and typhoid. After three days those whose stools were negative are sent into the third section where they stayed until sent to the interior. For the officers houses of a semipermanent character were provided. The food was the same as that given to the Italian officer or soldier of corresponding grade. No work was required of officers. No actual official records of venereal disease were available. The disease was stated to have been reduced to almost negligible proportions. A complete medical school had been established near the front line trenches. During the months when the army was comparatively inactive, all medical students in the service were ordered to San Giorgio di Nogaro, at which point professors from various medical schools who were in the army also assembled and were assigned to look after the sick in the vicinity. This enabled them to use the clinical material for the benefit of the students. Finally it may be stated that we were much impressed by the excellent care given the wounded. The medical officers were on duty early and late and a wonderful fellowship and mutual helpfulness prevailed.

HOT AIR THERAPY IN WAR WOUNDS.

Heated Air a Sterilizer, Cauterizer, Analgesic, and Cicatrizer.—Heated Air Douching.—Massage by Heated Air.—A Prophylactic Agent Against Infection.

Dr. Charles Greene Cumston, writing from Geneva, Switzerland, gives the following brief account of the uses of heated air in war medical and surgical practice. There is no question but that heated air is of considerable value in the treatment of injuries in war. Heated air at the temperature of carbonization is a perfect sterilizer and when blown over a large open gangrenous surface, it carbonizes the slough and penetrates all the irregularities, while its action as a thermocautery is also elective. Its destructive action on gangrenous tissues is enhanced by the secondary hyperemic and leucocytic reaction which is both uniform and intense. By many army surgeons it is regarded as almost a specific in these cases. Heated air at therapeutic temperature, from 50° to 100° C., is an excellent analgesic, its effect usually appearing within a few minutes. As a bactericidal agent, it must be employed at a high temperature. It does not act deeply in the tissues, but the good results obtained are explained by the resulting hyperemia, hyperleucocytosis, and the formation of immunizing bodies in large quantities in the morbid focus. Although heated air at the usual therapeutic temperatures is not absolutely bactericidal, it certainly prevents the development and increase of bacterial growth. Unquestionably, the most evident and constant effect of heated air is its cicatrizing action. Sloughing sores and torpid ulcers having no tendency to cicatrize return to life, changing in aspect and color by its use.

Heated air douching also acts by vibratory

massage of the wound by the column of air in motion, the secretions which maintain an intense exudation in the wound evaporating, and therefore, mechanically cleanses it. By varying the pressure and temperature, the effects and wound reactions are also varied. At a temperature of 50° C., a simple hyperemia of the diseased part is obtained by constant contact of a jet of heated air. With a temperature of from 120° to 150° C. a more active hyperemia and revulsion is obtained. Massage by heated air is obtained by forcing it on the wound under a pressure of from three to five kilograms. Active and reactive hyperemia is produced by alternating with a hot and cold air douche. At the temperature of carbonization, 400° to 800° C., air is unquestionably the ideal agent of sterilization.

Heated air can be used to advantage in the prophylactic treatment of wound infection from bursting shell, hand grenades, torpedoes, combined with a free incision and mechanical cleansing; in gangrenous and gas bacilli infected wounds after freely exposing the traumatic focus by incision; and in old foci or osteomyelitis following fracture, after free exposure and cleansing of the focus. At the temperatures producing hyperemia, 50° to 150° C., in the form of a douche, heated air gives excellent results in wounds with abundant suppuration; in acute outbursts of erysipelous or phlegmonous lymphangitis; in bed sores from decubitus or secondary upon nervous or medullary lesions; in atonic wounds without any tendency to cicatrization, particularly ulcerations in amputation stumps; in certain stubborn fistulae on the condition that they are not kept up by the presence of a foreign body or sequestra.

MEDICAL NEWS FROM WASHINGTON.

Bill to Give Dental Corps of the Navy the Same Status as that of the Army.—Physical and Temperamental Requirements for Submarine Commanders.—Sickness on the Pacific Fleet.—Navy Department's Arrangements for Treatment of Injured in Battle.

WASHINGTON, January 15, 1918.

The members of the army Dental Corps having been placed on the same basis as the Medical Corps in the matters of rank, pay, promotion, etc., it is considered only fair that similar legislation be enacted for the benefit of the Dental Corps of the navy. Senator Lodge has introduced a bill that provides that the Dental Corps of the navy shall consist of commissioned officers of the same grades and proportionally distributed among such grades as are now or may be hereafter provided by law for the medical corps, who shall have the rank, pay, promotions, and allowances of officers of corresponding grades in the Medical Corps, including the right of retirement as in the case of other officers. It also is provided that there shall be one dental officer for every thousand of the total strength of the navy and marine corps.

* * * * *

The navy medical officers have brought to the attention of the Navy Department the advisability of following the rule that officers detailed for instruction with a view to duty on board submarines should be as carefully selected as are those for aviation duty, although not necessarily on the same lines. The aviator flies alone, or accompanied at the most

by one or two men, whereas the submarine commander has from fifteen to twenty men under him whose lives are wholly in his keeping, and nothing in the whole range of a naval officer's duty calls for more perfect physical, mental, and moral equilibrium than the command of a submarine in war. For this reason, the medical officers believe that not only should officers slated for submarine duty be given a special physical examination with higher requirements, but also that special attention should be given to their temperamental qualifications. In addition to a liberal amount of good sound judgment, the medical officers believe that the following qualities also are necessary: mental and physical alertness, selfreliance, coolness, selfcontrol, attention to detail, appreciation of the necessity for effort, and ability to inspire confidence in men.

* * * * *

According to reports received at the Navy Department, malarial infections have been noted on nearly every ship serving in Mexican and Nicaraguan waters on the Pacific side. On one of the vessels of the reserve force serving in Mexican waters forty-six cases of malarial fever developed in sixteen days. An epidemic of measles occurred on the destroyer *Paul Jones*. An epidemic of mumps occurred on the old battleship *Oregon*, and there were a few cases on the armored cruisers *South Dakota* and *Pueblo*. A single fatal case of cerebrospinal meningitis occurred on the cruiser *Albany*. Several cases of amebic dysentery were admitted on vessels serving in Mexican and Nicaraguan waters, and they probably originated from insufficient precautions in regard to fresh fruit and vegetables obtained from shore. A brief immersion of all fruits and vegetables in boiling water affords reasonable protection against this type of infection. There has been an absence of smallpox in the Pacific Fleet, despite the fact that it exists in epidemic form in several of the Mexican ports and in spite of the number of refugees from infected ports transported on our ships.

* * * * *

Special efforts are being made by the Navy Department Bureau of Medicine and Surgery for the handling and treatment of the injured in battle and in improvement of the battle dressing stations. The plan of abandoning the sick bay and adjacent space in battle in favor of sites previously selected, protected by the ship's armor and having more or less permanent installment of lockers for surgical dressings, available running water, etc., is the basis of all elaboration in this regard. The battleship *Pennsylvania* has, and other ships of this type about to be commissioned or building will have, a complete portable sterilizing outfit by which dressings, utensils, instruments, and water can be sterilized by electricity at the respective battle stations.

Hereafter, and beginning with Battleship No. 43, vessels of that class will have installed auxiliary electric lighting circuits for operating room and battle dressing stations, so as to insure as far as possible adequate illumination of these important places amid the casualties of battle. The designs of the sick bay, dispensary, etc., of battleships 49 and 51 are based on the idea that the dispensary will be used strictly for compounding and dispensing of drugs and for clerical work.

Editorial Notes and Comments

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ANTISEPTICS OLD AND NEW.

We hear much now about antiseptics in the treatment of wounds. It has been suggested that recent systems of antiseptic treatment are really as old as Lister both in principle and practice and that there is little that is new in them. Since the discussion is on the carpet it might be well to remind ourselves that in the history of surgery the most important point, after the use of anesthetics, was the employment of antiseptics to prevent the formation of pus with its serious consequences for the patient. It seems almost impossible to believe that this teaching should have been promulgated seven centuries or more ago, but the republication of textbooks of medieval surgeons during the past twenty-five years has made all those familiar with medical history appreciate the age of this teaching and the thoroughness of its recognition. Doctor Buck in *The Growth of Medicine* has brought this out clearly and to read some of the passages he has quoted from old surgeons while the din of present day discussion is still in one's ears makes one realize completely the truth of James Russell Lowell's expression that "to read a classic is like reading a commentary on the morning paper."

Theodoric, for instance, whose father was a surgeon in the Crusades and three of whose brothers were surgeons, published in his volume on *Cyrurgia* the secrets which up to that time had been carefully guarded as family possessions. He declared explicitly: "It is not necessary, as Roger and Roland [Ruggiero and Rolando were two great Italian surgeons of Salerno who had written manuals of surgical practice before Theodoric's time] have taught and as many of their disciples are still teaching and as all modern [how curious this use of the word "modern" seems just after the middle of the thirteenth century!] surgeons profess, that pus should be generated in wounds. No error can be greater than this. Such a practice is indeed to hinder nature to prolong the disease and to prevent the conglutination and consolidation of the wound."

Many people are of the impression that the doctrine of laudable pus, that is, the formation in a wound of purulent secretion of not very virulent character, as a necessary preliminary to wound healing, which was the common teaching of the nineteenth century down to Lister's time, was also the teaching of all preceding centuries as far as we know anything about it. As a matter of fact the surgeons of the Middle Ages invented the expression "healing by first intenton." The very wording of the phrase is medieval Latin and in any modern language a knowledge of the significance of the medieval Latin words is necessary to understand what was intended by it. The first place the expression is noted is in the textbook on surgery by Bruno of Longobergo which was written just after the middle of the thirteenth century. He and Theodoric were contemporaries and Theodoric tells us of the "pretty linear cicatrices" which he had often seen in his father's practice and it is evident from this mode of expression that medieval surgeons must have been rather proud of them, but above all must have been quite familiar with them and recognized the fact that it required special skill and meticulous care to secure them.

Gurlt in his great history of surgery, *Geschichte des Chirurgie*, has given us the details of Theodoric's description of wound treatment. A rather thick pledget of linen, preferably old soft linen, was soaked thoroughly in wine. Theodoric insists that it should be good wine, meaning thereby rather strong wine of good body, and this was placed directly over the wound, which was then covered with a series of dressings. The wine evaporated after a while, leaving the dressings absolutely dry, and therefore this was familiarly called the "dry

dressing." Theodoric insisted that there should not be much manipulation of wounds, deprecated the use of probes and of extensive exploration, and tells of some very large, even gaping, wounds that had been treated with the best results by this method, the dressings not being renewed frequently. Above all, this method was recommended for the treatment of compound fractures and Theodoric is very proud of the results that had been secured by his family in such cases.

He had seen injuries of the skull involving considerable loss of brain substance heal under such treatment and while he does not hesitate to insist that tumors of the brain should be removed and particularly that depressed fractures should be lifted, he suggests that wounds of the skull with loss of brain substance should be treated expectantly. He had seen one case in his father's practice where a projectile penetrated the skull so that even one of the cells of the brain, which Gurlt thinks would be one of the ventricles, had been evacuated and yet the patient recovered. Apparently this mediæval surgeon had seen a case not unlike the famous crowbar case of the modern time.

Theodoric has a great many details of modern surgical technic. He describes a number of operations on the ear, nose, and throat, the removal of tonsils and polyps, the shortening of the uvula, and surgical intervention of edema of the glottis, and above all has a number of details on surgical intervention in wounds of the intestines. He inserted a tube of metal within the intestine, sewed the wounded intestines over this and reported good results. It would be quite impossible to credit such surgery only that we have the actual textbook which was first printed at Venice about the time of the discovery of America. Theodoric himself was a bishop, but seems to have made a good deal of money in his surgical practice, as he well might, since he had thus anticipated so many things that bring surgeons deservedly good fees in the modern time. He left the money for charitable purposes, but left a much more precious treasure to humanity in his book on surgery which surgeons have only been able to appreciate since they have rediscovered many of the things that he and his contemporaries were doing seven centuries ago.

DIAGNOSIS OF PRIMARY TUBERCULOSIS OF THE CONJUNCTIVA.

Although a rare morbid process, primary tuberculous conjunctivitis is met with from time to time and offers a special clinical type which is to be differentiated from the secondary type of the affection and lupus. The primary process is more com-

monly met with in children and young adults and usually only one eye is involved.

Primary tuberculosis and lupus of the conjunctiva are microscopically identical lesions, as both contain giant cells and the tubercle bacillus, but clinically it is important to differentiate them. Luc maintains that lupus never invades the conjunctiva primarily; a primary tuberculous ulcer, which is crateriform, is surrounded by yellowish miliary nodules. Lupus begins as a vegetative lesion and only loses its exuberance when it is about to end in a cicatricial process. Yellow points are never seen. The lupic ulcer cicatrizes spontaneously on its edges, while, on the contrary, the tuberculous ulcer extends from its borders. The usual site of lupus is on the free edge of the lid. Primary tuberculous lesions of the conjunctiva give rise to a marked purulent secretion and to involvement of the preauricular lymph node which is a constant phenomenon in the process. Nothing of the kind is met with in ocular lupus.

The differential diagnosis must be made between primary tuberculosis of the conjunctiva and epithelioma of this mucosa. In the former morbid process there is never any tumor, it being a surface lesion, and the ulcer is surrounded by miliary tubercles. The patient is more apt to be a child or young adult. In epithelioma, the lesion offers the aspect of a vegetating growth, which is ulcerated and which began on the skin and only invaded the conjunctiva secondarily. The patient is usually advanced in years, rarely a young adult, and never a child.

Syphilis produces conjunctival ulcers which are in some respects not unlike those of tuberculosis. The syphilitic type is anfractuons with irregular edges and is situated near the free border of the lid. It is a true loss of substance resulting from the breaking down of an initial sclerosis. The tuberculous variety is regularly crateriform, oval or round, more commonly seated on the tarsal conjunctiva and occasionally in the culs de sac.

Primary tuberculosis of the conjunctiva must not be mistaken for certain luxurious forms of chronic trachoma; this will be avoided if one takes into account the lardaceous aspect of the mucosa, the presence of miliary tubercles, and the involvement of the preauricular lymph node. Actinomycosis should be mentioned as a possible mistake in diagnosis. The search for the yellow grains will affirm or deny the existence of this morbid process, which should only be thought of in exceptionally rare cases.

To avoid confusion with the affections enumerated or with others of lesser importance, such as conjunctival polypi, and to make an undeniable sci-

entific diagnosis, an extemporaneous biopsy should be made in every case where there is any suspicion as to the true nature of the conjunctival process. A portion of the piece of tissue removed should be examined microscopically, while the remainder is to be inoculated with all proper aseptic technic, into the anterior chamber of the eye or peritoneal cavity of a rabbit or guineapig.

THE MIND OF THE SOLDIER.

It is a hopeful sign of progress that parallel with the marvelous mechanical development of modern warfare, the progress of the medical sciences has more than held its own with respect to the prevention of disease among troops, the care of the sick, and the salving of the injured as well as the teaching of the crippled. useful occupations which will make them selfsupporting. In previous wars the disease casualty was greater than the wound casualty, but even at the present time little or no attention is paid to the mental health and development of the soldier. To be physically fit and healthy is all that is required of the soldier. It would seem, however, that because of the highly specialized devices of modern warfare with which the soldier must become acquainted, his mental requirements should rise accordingly. American recruiting officers are now paying much attention to this phase of the work.

Schier, in a recent number of the *United States Naval Bulletin*, found that about twelve per cent. of those physically acceptable fell below requirements mentally. The detection of the feeble-minded among the recruits has a special significance beyond the effect it has upon the efficiency of the unit of which the applicant would be a member, in that so many of those ascertained feeble-minded by the usual tests are either frank cases of dementia præcox or have later had dementia præcox engrafted on them. Most of these apparently engrafted cases conform to the hebephrenic type. Equally important with the detection of this feeble-minded dementia præcox type is the detection of the psychopathic personalities in whatever form they manifest themselves. It can easily be understood that for these individuals the stress or even the disciplinary repression would be a provoking force in activating their mental condition. An equally difficult task for the recruiting medical officer is the detection of the malingerer.

Aside, however, from the detection of the psychopathic or mentally feeble person before acceptance for military service, it must not be forgotten that military life has at least the same incidence of mental and nervous disease and disorder that civil life has, and much more probably because of the new and unusual circumstances under which the soldier must live. On the other hand, because of

the high pressure of medical and surgical work incident to active field duty this type of illness goes undetected or if detected has no room where emergency cases must be treated. Unless psychiatrists are specially attached to the field and base hospital these cases must go undetected and untreated. It is for this reason that the equipment and attachment of neuropsychiatric units to the hospitals are so important. A unit of this kind will not only serve in the detection and in the treatment of these cases but will be a valuable asset in developing the mental hygiene of the soldier and in indicating the best methods for reducing the psychogenic factors of military life.

The fact that certain psychological conditions in respect to tools, working hours, and environment have been found to influence the efficiency of the work and the wellbeing of the worker in nearly all industrial pursuits should at least lead to investigations along similar lines in military pursuits. It is not sufficient that the sanitary side of military life has been improved if the mind of the soldier is neglected and the whole problem of reducing the incidence of mental disease and disorder is overlooked. Moreover, the care of the mind of the soldier during warfare would eliminate the numerous post bellum mental conditions for which the soldier must be mustered out and which help to swell unnecessarily the already too crowded class of the insane.

REMOVAL OF SUPERFLUOUS HAIR CONSTITUTES THE PRACTICE OF MEDICINE.

The definition of the term "practice of medicine" has been laid down in Chapter 49, Section 160, Subdivision 7 of the Public Health Laws of 1909 of the State of New York. An interesting judicial precedent has recently been established construing the application of this definition to so called "beauty doctors" in the decision of Mr. Justice Benedict in the case of *Rose Engel vs. Mollie Gerstenfeld* in the Appellate Term of the Supreme Court of the State of New York. The definition reads as follows: "A person practises medicine within the meaning of this article, except as hereinafter stated, who holds himself out as being able to diagnose, treat, operate, or prescribe for any human disease, pain, injury, deformity, or physical condition, and who shall either offer or undertake, by any means or method, to diagnose, treat, operate, or prescribe for any human disease, pain, injury, deformity, or physical condition."

In the case in court the plaintiff, who conducted a beauty parlor, undertook to remove superfluous

hair from the face of the defendant by means of the electrical needle. For this she was to be paid at the rate of \$2.50 an hour. A part of the bill, \$225, was paid at the end of two months, but a balance of \$223.75, for later treatment, was not paid, and it was for recovery of this balance that suit was brought. The Appellate Court held that the plaintiff had committed a misdemeanor in undertaking to treat the "deformity," or "physical condition" of the skin of Miss Abrams and that in consequence she was not entitled to recover. The case is somewhat similar to that of *People vs. John H. Woodbury* Dermatological Institute (*New York Law Journal*, July 15, 1908), where the Court of Special Sessions of the City of New York held the defendant, a corporation and its president, guilty of "advertising to practise medicine" within the meaning of the Laws of 1907, Chapter 344, which contained in Section 15 a definition of the practice of medicine similar to that in the present law. In that case one of the deformities which the defendant advertised to cure was superfluous hair.

One of the most interesting features of the case from the medical point of view is the opinion of Mr. Justice Callaghan, who dissents on the ground that the presence of superfluous hair on the face does not constitute a "deformity." The learned Justice in discussing the meaning of the word says:

The Century Dictionary described a "deformity" as a "deformed or misshapen condition; an unnatural growth, or a distorted or misshapen part or member; disfigurement; as a bodily deformity." The statute does not state or contain a definition of any of these words. The presumption, therefore, is that they were used in their ordinary sense, and with their ordinary intent. A growth of hair on a woman's face can certainly not be a "deformed or misshapen condition." In considering the second meaning given, viz.: "an unnatural growth or a distorted or misshapen part or member," the words "unnatural growth" cannot but pertain to matters that are *ejusdem generis*, when joined with the expression "or a distorted or misshapen part or member," common sense dictating to us that in the ordinary acceptance of such terms, reference must naturally be to a physical growth or deformity, such as a web foot or a hunch back. Proceeding to the third meaning given by the Century Dictionary we find that the word "disfigurement" is stated to be "the state of being disfigured," i. e., "physically marred in any manner." It would clearly be absurd for us to say that "physically marred" would be applicable to the case at bar. I am not satisfied that the unnatural growth of hair on a woman's face is a deformity within the common definition of that word.

Had the Justice pursued his philological studies further, had he sought for the general acceptance of the term in the common language of the people, he would surely have found that the presence of superfluous hair on the face of a woman is quite commonly, in fact, almost universally, regarded as a "deformity," and a serious one. It is fortunate

that his associates took a view of the definition of the term more in consonance with general usage, for the decision will be of value in curbing the illegal practices of these so called "beauty parlors."

A PROUD RECORD.

The secretary of war in his report for 1917 says: "Indeed the honor of first participation by Americans in this war belongs to the Medical Department." Representatives of that department were serving with the English and the French forces months before any other branch of the American army was on foreign soil. Officers and men of the Medical Department are now serving in Italy and on the battle lines of Macedonia. Quite recently Ambulance Section No. 5, on duty with the French forces, has received the "fourragere," the first decoration for valor given to any American military organization in this war. This decoration which is rarely bestowed may be worn only by members of an organization twice cited in orders for extraordinary heroism. As pointed out in *The Military Surgeon* for January, the medical profession of the United States has made a record in this war of which its members may well be proud, for they have been first on the firing line, have gone furthest, and have now been adjudged the bravest.

News Items.

Camp Merritt Hospital.—A thousand bed hospital is in process of construction at Camp Merritt, the embarkation camp near Tenafly, N. J. The hospital will be under the command of Major Leeson O. Tarleton, M. C. Hitherto the sick from this camp have been sent to the Englewood Hospital or to the St. Mary's Hospital at Hoboken. Both this hospital and that at Lakewood will have sixty-five female nurses besides the usual quota of orderlies.

Medical Reserve Officers Promoted.—The following named captains in the Medical Reserve Corps have been named majors, with rank from December 26, 1917: Charles Marion Aves, John Taylor Barbee, Herbert Hazeltine Frothingham, Woods Walker Lynch, Frank R. Maura, Edward August Meyerdier, Mahlon Dickerson Ogden, Harry Alexander Peyton, William Edward Shea, Edward Burnside Simmons, Louis A. Spaeth, and Albert Rotild Goodman.

Associated Out Patient Clinics.—The annual meeting of this organization will be held on Friday evening, January 25th, at 8:15 o'clock, in the lecture room of the Presbyterian Hospital. The programme will include a discussion of the following topics: The Voluntary Workers in Dispensaries, by Dr. Charles Hendee Smith; Malnutrition Clinics and the Work of the Poliomyelitis Clinics, by Dr. E. Lewinski-Corwin, executive secretary of the association; Dispensary Problems Growing Out of the War. The name of the speaker who will introduce the last topic has not been announced.

Massage Operators Must Be Licensed.—The Department of Health of the City of New York directs attention to the fact that the code of ordinances of the city requires every person giving massage treatment, with the exception of physicians, osteopaths, and registered nurses, to be licensed and provided with a certificate showing that the licensee is free from communicable diseases. It is also illegal for any massage operator to treat a patient of the opposite sex in his or her office without first receiving a written order from the physician specifying the number of treatments, which must not be above ten on any one order. This is required only where the treatment is administered in the office of the operator.

Street Accidents in New York.—Street accidents, with attendant fatalities, increased in New York during the past year, despite every effort made to make the streets safer. The figures compiled by the statistician of the Police Department show that the total accidents in 1917 amounted to 26,145, as compared with 24,464 the previous year. The total fatalities in 1917 were 699. In 1916 they were 644. The street accidents show that in 1917, 2,295 children under six years of age were injured, as compared with 2,024 the year before. Between the ages of six and fifty, 5,443 were injured in 1917; in 1916, 5,066. In 1917, 4,340 persons over fifty years of age were injured, as against 3,824 in 1916. The greatest number of accidents were charged against passenger automobiles, with motor trucks second and motorcycles third.

Personal.—Major Glenn I. Jones, Medical Corps, U. S. A., will repair to Washington, D. C., and report in person to the Surgeon General of the Army for consultation, and upon the completion of this duty will proceed to Edgewood, Md., and take station at that place for duty in connection with the establishment of a hospital.

Dr. I. H. Goldberger has been reappointed chairman of the Bronx County Milk Commission. With him are associated Dr. S. Rosenzweig, Dr. Vincent Hayward, Dr. Stella Shafer-Epstein, and Dr. William Rost.

Dr. Irving David Steinhart has been appointed by the Jewish Board for Welfare Work in the United States Army and Navy to give instruction in the teaching of sex hygiene to the camp workers of this organization. The instruction will be given by a course of lectures, the first of which was delivered on Friday evening, January 11th.

Pneumonia in Training Camps.—Pneumonia caused 149 of the 235 deaths reported among the National Guardsmen and National Army men training in this country in the week ending January 11th. The weekly report of the Division of Field Sanitation shows that eighty-eight guardsmen died, as compared with 100 the week before, and 147 National Army men as against 167 the previous week. Both the hospital admission and noneffective rates in the Guard and National Army Camps increased for the week, with pneumonia generally prevalent. Among the guardsmen there were 342 new cases of pneumonia, and in the National Army 340. Camp Doniphan, Okla., led the guard camps in the number of new cases of pneumonia with fifty, and Camp Wheeler, Ga., was second, with forty-seven. Camps MacArthur, Tex.; Bowie, Tex., and Beauregard, La., were above the average in the number of new cases with forty-five, forty-six, and thirty-six cases, respectively. Camp Travis, Tex., headed the National Army camps with new cases of pneumonia with ninety-four, against seventy-two the week before; Camp Pike, Ark., was second with forty-one cases, and Camps Lee, Va., and Taylor, Ky., reported twenty-four and thirty-four new cases, respectively. The week before there were fifty-nine new cases at Camp Lee.

Meetings of Medical Societies to Be Held in New York During the Coming Week.—Monday, January 21st, New York Academy of Medicine (Section in Ophthalmology), Yorkville Medical Society, Medical Association of the Greater City of New York (annual), Psychiatric Society of Ward's Island; Tuesday, January 22d, New York Academy of Medicine (Section in Obstetrics and Gynecology), New York Psychoanalytic Society, New York Dermatological Society, Metropolitan Medical Society of New York City, New York Medical Union, New York Otolological Society, New York City Riverside Practitioners' Society (annual), Valentine Mott Medical Society, Washington Heights Medical Society, Therapeutic Club (annual); Wednesday, January 23d, New York Academy of Medicine (Section in Laryngology and Rhinology), New York Surgical Society, New York Society of Internal Medicine; Thursday, January 24th, Ex-Intern Society of Seney Hospital, Brooklyn, Hospital Graduates' Club, New York (annual), New York Physicians' Association; Friday, January 25th, Society of New York German Physicians, New York Clinical Society, Manhattan Medical Society, Society of Alumni of Sloane Hospital for Women, Brooklyn Society of Internal Medicine, Italian Medical Society of New York; Saturday, January 26th, New York Medical and Surgical Society (annual), West End Medical Society, Harvard Medical Society, Lenox Medical and Surgical Society.

The Lakewood General Hospital.—The work of converting the Lakewood, N. J., Hotel into a general hospital of a thousand beds is almost complete. The recreation grounds make it an ideal place for convalescents. For the present it will care for the sick of the Army from camps, cantonments, and ports of embarkation, under command of Colonel Allen M. Smith, M. C.

Instruction in the Treatment of Infected Wounds.—The Department of Surgery of the Long Island College Hospital has arranged a practical course of instruction in the treatment of infected wounds for medical officers of the Army and Navy. This course consists of ten daily sessions from 9 to 12 a. m., Saturdays excepted, and is open to classes of not more than six members. A new class will be started on the first and third Mondays of each month. The course will be conducted by Professors Campbell, Harloe, and Oliver.

Rules for Physical Examination of Recruits to Be Revised.—A board has been appointed to meet in Washington, D. C., at the call of the senior member, for the purpose of revising the regulations for the physical examination of applicants for enlistment in the army and registrants under the selective service regulations. This board consists of the following members: Colonel George E. Bushnell, United States Army, retired; Lieutenant Colonel Thomas L. Rhoads, Medical Corps; Lieutenant Colonel Philip W. Huntington, Medical Corps; Major Pearce Bailey, Medical Reserve Corps; Major Joseph C. Bloodgood, Medical Reserve Corps; Major Elliot G. Brackett, Medical Reserve Corps; Major William H. G. Logan, Medical Reserve Corps; Major Warfield T. Longcope, Medical Reserve Corps; Major Walter R. Parker, Medical Reserve Corps; Major Charles W. Richardson, Medical Reserve Corps; Contract Surgeon Henry H. Morton, United States Army (alternate, Contract Surgeon William A. Pusey, United States Army).

Medical Problems in the War Draft.—A stated meeting of the Medical Association of the Greater City of New York will be held in Du Bois Hall, New York Academy of Medicine, Monday, January 21st, at 8:30 p. m. The evening will be devoted to a discussion of Medical Problems in the War Draft. Papers on the subject will be presented as follows: Rehabilitation of the Rejected, by Dr. William Harris Sheldon; The Practical Operation of the Selective Service Act, by Roger B. Wood, Esq., recently Director of the Draft in New York City for the Adjutant General of the State of New York; The Medical Advisory Boards, by Dr. Charles N. Dowd; The Need for Standardization of Local Board and Army Examinations, by Dr. Richard Ward Westbrook; Some Abuses of the Medical Side of the Draft, by Dr. Victor C. Pedersen; The Cardiovascular Problem in the Draft, by Dr. Harlow Brooks. The discussion will be opened by Dr. James F. Rooney, from the office of the Adjutant General of the State of New York, and Dr. James S. Waterman.

Health Commissioner of the City of New York.—Dr. J. Lewis Amster, of 2055 Bathgate Avenue, the Bronx, has been appointed Commissioner of Health for the City of New York, to succeed Dr. Haven Emerson, at a salary of \$7,500 a year. Doctor Amster was born in New York in 1879, was graduated from the College of the City of New York, and in 1898 from Cornell University Medical School. He has served as house surgeon in the Lying-In Hospital, and as house physician in St. Mark's Hospital, and is clinical assistant surgeon at the Polyclinic Medical School and Hospital and consulting surgeon to the Home for the Aged and to the Hospital of the Little Sisters of the Poor. He is president of the Cornell Medical Alumni and of the Bronx County Medical Society. Doctor Amster is a contributor to THE NEW YORK MEDICAL JOURNAL. On assuming the duties of his office he issued the following statement: "The work of the department of health is perhaps the most important activity carried on by the municipality. The present organization has been built up as a result of years of labor. I realize that the duties of this important office are tremendous, and I am satisfied that cooperative measures will be immediately established between the department of health and the physicians of this city. Only with such cooperation and mutual understanding can the efficiency of the health department be maintained."

Modern Treatment and Preventive Medicine

A Compendium of Therapeutics and Prophylaxis, Original and Adapted

TREATMENT OF ACUTE MERCURY BICHLORIDE POISONING.

BY LOUIS T. DE M. SAJOUS, B. S., M. D.,
Philadelphia.

(Concluded from page 85.)

In the preceding issue attention was called to the probable utility, as a factor in the Lambert and Patterson treatment of bichloride poisoning, of the organic potassium salts administered by mouth and rectum, acting as alkalies after destruction of their organic components in the system. According to Fischer's view of the pathogenesis of nephritis, the toxic action of the bichloride on the renal cells results successively in asphyxia, an acid state, and a swelling of these cells. By overcoming the acid state, the alkalies relieve the cellular swelling and thereby tend to prevent or overcome anuria. Apart from the presumably acid condition of the renal cells themselves, it is well known that a general acidosis may occur in nephritis, especially in the later stages. Lewis and Rivers, 1916, as already mentioned, found evidence of an acidosis even during the early stages of bichloride intoxication. According to Marriott and Howland, 1916, the acidosis of nephritis is due neither to acetone bodies nor lactic acid, but to inability of the kidneys to excrete acid phosphate; their clinical tests actually showed an increase in the phosphorus in the serum to many times the amount normally present.

In toxic nephritis the value of alkalies has been definitely shown experimentally. Thus, MacNider ascertained that alkalies would reduce the severity of experimental uranium nephritis, a condition in which, as in mercurial nephritis, the convoluted tubules are the structures chiefly involved. More recently Goto, 1917, likewise in uranium nephritis, demonstrated an acidosis and by giving sodium bicarbonate through a stomach tube secured not only an improvement in the acidosis, but also a reduction of the albumin and casts in the urine, of the plasma chlorides, and to a less extent of the urea in the blood, previously found increased. In the animals treated with the bicarbonate, furthermore, the pathological changes in the renal tissues were found less severe than in those untreated. In relation to arsenical nephritis, in which the anatomical changes are produced mainly in the glomeruli, Woodyatt, 1915, has reported a case benefited by rectal use of Fisher's solution.

That large doses of sodium bicarbonate administered intravenously soon after ingestion of mercury bichloride might prove valuable in protecting the kidneys has been suggested by Lewis and Rivers, 1916. These observers lay especial stress on measures to combat retention of waste nitrogen due to renal impairment, believing such retention to be a factor in the early fatal issue of bichloride cases, in spite of the fact that signs of uremia are rarely observed. Carbohydrates having marked power to lessen the consumption of proteins in the body, and

hence to reduce the amount of waste nitrogen in the blood, these authors advocate free administration of carbohydrates to postpone the extreme grades of nitrogen retention which usually precede death. If the carbohydrates are not retained when given by mouth, glucose in ten to fifty per cent. solutions is to be given intravenously. Lewis and Rivers found that even after six days of anuria urinary secretion might be thus reestablished and the kidneys regain a practically normal functional capacity within twelve days. From this viewpoint, that of sparing proteins, the use of carbohydrates is especially adapted for treatment of the later stages of mercurial nephritis. Their employment, on the other hand, in the earlier stages as diuretics and dehydrants of swollen renal cells has already been referred to.

Another measure, occasionally availed of to obviate the consequences of the renal intoxication, is decapsulation of the kidney. The efficiency of the newer methods in counteracting anuria renders it advisable seriously to consider whether this operation is ever indicated. After all, the procedure probably secures but one of the several benefits conferred by the internal and colonic saline alkaline treatment, viz., release of the abnormal pressure due to swelling of the renal cells which by inducing stasis, invites anuria. The one measure tends to bring relief from the outside, the other from within. H. Luxembourg, 1915, reporting on four cases treated by decapsulation, states that these patients died in spite of it, though two of these showed marked improvement in urinary secretion after the operation. The fourth recovered after decapsulation on the ninth day. Reference is also made by this author to Kummel's case, in which decapsulation of the right kidney after anuria of seven days' duration was followed in a few hours by free passage of urine; the patient, however, succumbed later. On the whole, though the efficiency of the operation in restoring urinary flow cannot be denied, the field for it now seems limited.

The frequency of cases ultimately fatal in spite of successful restoration of a previously inhibited urinary flow demonstrates the necessity of also counteracting toxic injury elsewhere in the system, in particular in the colon. The insidious nature of the colitis is well illustrated in a case seen by Lambert and Patterson in which, after three days of anuria, free colonic irrigations led gradually to resumption of free urination, yet after three weeks severe colitis developed and the patient succumbed to intestinal hemorrhage. Such a case tends to show that, if lethal injury is to be avoided, delay in instituting treatment of the colon is even less permissible than deferred treatment of the kidneys. In spite of the apparent failure of colon irrigations in this instance, such irrigations, when begun early, have proved of inestimable value in warding off ulcerative colitis. In the Lambert-Patterson treatment this feature is provided for by colon irrigation

twice daily, continuous rectal introduction of potassium acetate solution by the drop method being also carried out. The conclusion of these observers is that when such treatment is faithfully carried out, the tendency to diarrhea and colitis in bichloride cases is regularly controlled. In a case reported by J. H. Anderson, 1915, ectocomy was resorted to for bowel irrigation, five to ten gallons of water being daily used in this manner, with recovery in spite of total anuria and the usual early abdominal symptoms.

The liver is another organ seriously endangered. Kahn, Andrews, and Anderson, 1915, chemically analyzing the cadaver in a fatal case, found a higher ratio of mercury in the liver than in any other structure, including the kidney. Burmeister and McNally, 1917, found in experimental poisoning that the hepatic changes vary as the duration of the intoxication. The best method of protecting the liver from absorbed mercury consists obviously in a strict enforcement of all measures calculated to hasten elimination of the poison. These measures have already been described.

From this review of the newer procedures it will be clear that our resources against acute bichloride poisoning have been considerably enriched from various directions. Especially by a combination of these methods should gratifying results in the future be secured. When a case is first seen Carter's antidote of sodium phosphite and sodium acetate, or Fantus's combination of sodium hypophosphite and hydrogen peroxide, should be given, and gastric lavage with sodium bicarbonate promptly carried out—the latter to be repeated later till the gastric contents by Vogel's test show no more mercury. Further to minimize organic damage, the various steps of the Lambert-Patterson method, or similar measures, should be instituted, including an alkali sugar mixture every eight hours, with milk, or better egg albumin water, every two hours; continuous proctocolysis with potassium or sodium acetate solution; colon irrigations with water or dilute sodium bicarbonate solution twice daily, and a hot pack once daily. Duration of treatment may be gauged according to the elimination of mercury in the urine. In cases already advanced the protein sparing effect of carbohydrates, such as glucose, may prove of some service. Particularly to be realized is the fact that active measures now appear to be available for every stage of the intoxication. Omission or delay in the application of any of these measures, when indicated, is from the start fraught with serious risk.

Total Hysterectomy for Nonmalignant Conditions.—R. Worrall (*American Journal of Obstetrics*, December, 1917), having encountered three cases of cancer of the cervix after subtotal hysterectomy and noticed an unsatisfactory condition of many other patients similarly treated, was led to evolve a technic which, he believes, meets all the objections to both the total and the subtotal operations. The bladder having been emptied, the vagina is scrubbed and disinfected, and a syringe of freshly made tincture of iodine slowly injected into the uterine cavity. Through a median abdominal incision, each

round ligament is held up and divided. The finger having been thrust through the opening thus made in the anterior layer of the broad ligament, the vascular arch above the finger is divided between clips on the uterine side of the ovaries, the latter always being left in if healthy. The peritoneum between the cut round ligaments is then divided, the bladder dissected down with scissors, the bared uterine vessels clamped a little below the inner os, and with blunt bent scissors the cervical musculature is incised all around, penetrating about halfway to the canal. Below, the cut is expanded to include all the external os. Figure of eight catgut sutures are used anteriorly, posteriorly, and laterally to close the opening into the vagina. All artery clamps having been replaced by ligatures, a pursestring suture on each side closes the broad ligament, and unites the round ligament stumps to the cervix. These sutures secure the ovaries perched on the rim of the cervix with their vascular supply unimpaired. In the presence of infection drainage is secured by not closing completely the opening into the vagina. The parietal wound is closed by five tiers of sutures. With this operation hemorrhage is slight, the keystone of the vaginal vault is not weakened, convalescence is rapid, and all glandular epithelium is removed, together with the danger of cancer. The author's entire record is 125 cases, with one death.

Treatment of Leucorrhea with Lactic Acid Bacilli.—Frank Benton Block and Thomas H. Llewellyn (*Journal A. M. A.*, December 15, 1917) proceeded on the basis of the fact that the normal vaginal secretion is acid from the growth of the Bacilli of Doederlein, while that in leucorrhea is alkaline and these organisms are absent. It was their hope that the implantation of acid forming organisms would lead to a control of the leucorrhea through destruction of the saprophytic organisms. The technic of treatment included a thorough pelvic examination to eliminate surgical causes of the leucorrhea, testing of the reaction of the secretion, thorough cleansing of the vagina of mucus and discharges by an alkaline spray, and drying with cotton. Then a tablet of Bulgarian bacilli was slightly moistened with water and inserted into the upper portion of the vagina through the speculum. There it was smeared over the surface and the speculum was withdrawn. No tampons were applied and the patient was cautioned to take no douches. The treatment was repeated at weekly intervals. When the reaction of the secretions had become acid the treatment was required at intervals of only a month or more. The method proved of little or no value in the vulvovaginitis of children while gonococci were still present, but after their disappearance it hastened the reduction of the discharge and the disappearance of the irritation. The nonspecific types of vaginitis in children usually responded well to the treatment. In cases during the child bearing period having a gross pathological pelvic condition, and in those of gonorrheal origin, or due to cervical erosion, laceration, etc., the treatment was of little value. About half of the remaining cases of leucorrhea in such women responded well to the treatment and the best results of all were secured in the cases of senile atrophic vaginitis.

Sciatica.—Israel Strauss (*Journal A. M. A.*, December 15, 1917) believes that in a large proportion of the cases of sciatica the lesion involves the nerve itself and in such cases, after the exclusion of possible lesions elsewhere, he finds that the most satisfactory method of treatment comprises absolute rest in bed, the application of warmth along the course of the nerve and specially in the gluteal region, and the administration of large doses of the salicylates during the early stages. If the attack does not respond to such treatment one of two other methods of treatment can be used with good results. The first consists in the injection of 100 to 150 mils of physiological saline solution into the region of the sciatic nerve at a point one inch to the outer side of the junction of the inner one third with the outer two thirds of a line drawn between the sacrococcygeal articulation and the lowest point of the posteroexternal border of the great trochanter. From three to five such injections may be required at intervals of two days before there is permanent relief. The second method is the injection of sixty to eighty mils of warm sterile physiological saline solution into the epidural space through the superior sacral foramen. The first ten to twenty mils of the saline should contain a small amount of epinephrine and 125 mgm. of novocaine. The injections should be given at two day intervals and three are usually sufficient, though sometimes more may be required. Much harm is done in cases of sciatica by massage and this should invariably be interdicted.

Sterilization by Dakin's Solution and Secondary Hemorrhage.—E. F. Bashford (*Lancet*, October 20, 1917) made simultaneous parallel tests of the antiseptic power, the lethal action, and the digestive property of Dakin's solution and a number of other antiseptics by immersing living tadpoles in solutions of the antiseptics of varying concentration. Dakin's solution and eusol were found to be practically the same in their antiseptic powers and their lethal effects, though eusol was far less potent in digesting the tissues than was Dakin's solution. Both sterilized the living tissues in about half the time required to kill the animals. Chloramine proved relatively less toxic to the animals than the two preceding, as compared with its antiseptic property. It sterilized the tissues in about one quarter of the time required to kill the tadpoles. Flavine, iodine, and mercuric chloride did not show this separation of the sterilizing and lethal actions, though iodine proved to be an efficient antiseptic for the sterilization of living tissues. Further experiments showed that the digestive action of Dakin's solution and eusol were far more marked on previously killed tissues than on those of the living animal and this corresponds with the clinical observations. It was concluded that secondary hemorrhage is not due to the erosion by digestion of normal vessels, but that it results from previous damage to the walls of the vessels with the subsequent erosion of the dead tissues. The great advantages of Dakin's solution would seem to lie in its effectiveness in sterilizing wounds and its property of promptly cleaning up the wounds by the rapid digestion of all dead tissues. Secondary hemorrhage need not be feared from uninjured exposed vessels.

Calcium Sulphide in Treatment of Poisoning by Mercuric Chloride.—Charles C. Haskell and R. H. Courtney (*Journal of Laboratory and Clinical Medicine*, November, 1917) performed experiments on dogs subjected to mercuric chloride poisoning to determine whether calcium chloride is an antidote of value. While it is admitted that Wilms has suggested a way of treating such poisoning that is capable of causing the recovery of dogs that would die if untreated, the authors believe that the value of intravenous injections of solutions of calcium sulphide depends chiefly or entirely on the fluid which is introduced, and that equally good results can be secured by the intravenous injection of physiological salt solution. The intravenous injection of the sulphite possesses dangerous possibilities, and it may be that a fatal outcome in cases of mercurial poisoning is hastened, rather than retarded by its use. A plea is made for the continued use of the methods of proved value in the treatment of bichloride poisoning, such as gastric lavage, colon irrigation, hot packs, and the free exhibition of fluids.

Therapeutics of the Cardiopulmonary Circulation.—G. Colleville (*Presse médicale*, October 25, 1917) reports studies on the pulse or differential blood pressure as influenced by various drugs, with general exercise and breathing exercises superadded. The ratio of systolic pressure to diastolic pressure is deemed of far greater import, from the therapeutic standpoint, than the actual difference between the two or pulse pressure. Stress is laid on the myocardium, circulatory dynamism as a whole, and the condition of the nervous system as the three main factors in the regulation of blood pressure. Blood viscosity is also an important feature. The author employs the Pachon oscillogram as a means of working out precise therapeutic indications in the presence respiratory or nervous deficiency, retention of toxic products through emunctory impairment, insufficiency of the pulmonary circulation, or myasthenia or debility of the general vascular tension. Radional medication of the pulmonary circulation generally involves the use of diuretics and vasodilators to reduce excessive circulatory resistance, sometimes with heart tonics given in addition. Terpene, sodium benzoate, acting as diuretics and liquefying bronchial secretions, together with codeine, which allays cough and amplifies respiration, constitute a triad of remedies serving to unload peripheral resistance of the pulmonary resistance, thereby improving both the pulmonary and the general circulation. Quebracho combined with lobelia notably amplifies the respiration and secondarily imparts greater elasticity to the lesser circulation, without exerting any special effect on the general circulation. Caffeine iodide acts as a tonic to the lesser circulation. Fibrinolysin, loosening recent pleural adhesions, restores play to the pulmonary apparatus and especially the lesser circulation. Adrenalin acts with special strength on the lesser circulation as vasoconstrictor. Strophanthin stimulates the lesser circulation without acting on the general circulation; lobelia increases this action. Sodium iodide influences blood viscosity and overcomes pulmonary stasis; iodoglysol acts even more strongly in this direction.

Treatment of Trench Feet by Passive Hyperemia.—Philip Turner (*Lancet*, October 27, 1917) believes that the treatment of this condition should include thorough cleansing and the prevention of secondary infection as well as measures for the relief of the original and primary inflammatory process produced by the cold. The plan followed by the author, which has given the best of results, is first to clean the feet with ordinary soap and water, clean and cut the nails, and then to paint the skin with a one per cent. solution of picric acid in methylated spirit. This latter application is repeated daily at first, and later every other day. The feet are then wrapped in sterile gauze and left exposed to the air until they are more comfortable when covered by the bedclothes. The inflammatory process is treated by Bier's passive hyperemia which is begun as soon as the cleansing is completed. The venous return is cut off by an elastic bandage applied just above the knee. This is left on for eighteen hours the first day, removed and reapplied after an interval of six hours. Thereafter the constricting bandage is applied for twenty-two out of each twenty-four hours. The treatment should be painless and a complaint of pain demands the removal of the bandage. The treatment usually relieves the pain in a few days and the blisters dry up and desquamate. Gangrenous parts also dry rapidly and separate, and the amount of tissue lost is strikingly less than would be supposed by the apparent extent of the signs of gangrene. As soon as the pain is gone the patients are allowed to walk a little in soft shoes, the hyperemia being continued when they are not walking.

Cure of Inguinal Hernia.—Alfred J. Hull (*British Medical Journal*, October 27, 1917) has devised an operation which has for its basic principles the removal of the hernial sac at the highest possible level, the reduction of cutting of the tissues to the minimum, and the avoidance of traumatism to the spermatic cord. Under local anesthesia from the injection of 0.5 per cent. novocaine solution midway between the extremities of Poupart's ligament and half an inch above, an incision from half to one inch long is made over this same point and carried down to the external oblique aponeurosis. The fibres of this aponeurosis are then split for half an inch so that the opening lies directly over the cord. The cremasteric and spermatic fasciæ covering the cord are drawn out through this split and the cremasteric fibres parted. The spermatic fascia is then incised and the hernial sac exposed. This sac is incised with scissors for half an inch between a pair of Halstead's mosquito forceps. Four hemostatic forceps are applied to the edges of the incised sac, it is then held open and four incisions are made to enlarge the aperture, each between a pair of the forceps. If omentum is found in the sac it is drawn down, ligated, and cut off. The neck of the sac is next freed by a short incision along the margin of the crista and it is drawn down gently and ligated as high as possible. This can usually be done at a level about two inches above the internal ring. The normal elasticity of the peritoneum at once displaces the ligated point to a location well behind the rectus. This is usually all of the operation except

the suture of the skin wound with fine silkworm gut, passed down to take up the edge of the external oblique. In the rare cases having a large internal ring or very thin peritoneum the conjoined tendon is drawn down and sutured to Poupart's ligament without enlarging the incision.

Cholera.—Vivian B. Bennett (*Indian Medical Gazette*, October, 1917) recommends as the theoretically correct line of treatment, which has proved markedly efficient in a number of cases during a severe epidemic, the free use of castor oil. The purposes of the treatment are: 1, to remove the cholera vibrio and its toxins from the bowel; 2, until this is done to protect the mucous membrane from its irritating action; 3, to pass substances through the bowel to limit or prevent the growth of the vibrio, or to disintegrate its toxins. The great obstacle to efficient treatment is the difficulty of getting anything into the bowel, as the stomach is so irritable. He administers two ounces of castor oil at once. In some early cases this is retained and soothes the irritability of the stomach; if it is rejected he chloroforms the patient, washes out his stomach, and introduces the drug. Permanganate can be mixed with the castor oil at the time it is given; it becomes somewhat discolored but seems to be efficient. Betanaphthol or salol can be used in the same way. After this first dose an ounce of castor oil is given every hour or two.

Radium Therapy of Recurrent Cancer of the Breast.—Sinclair Tousey (*Texas Medical Journal*, November, 1917) describes two distinct effects from the application of the radiation from radium which are obtained by slightly different methods of application. The destructive effect is characterized by the death of tissue and its extrusion as a discharge or scab. It may be accompanied by redness, pain, and suppuration if the application is made to a region where the skin is thin and vascular like the normal integument of the back of the hand. This effect of radium with suppuration is employed in recurrent cancer of the breast when there are ulcerated areas of moderate extent and apparently of a superficial character. A glass tube containing twenty mgm. of radium having a radioactivity of two million is applied for about half an hour to an area about half an inch in diameter and without interposition of any filter except the thinnest rubber to prevent contamination of the glass tubes. Half an hour constitutes the complete treatment for the half inch area. A few days later a condition of moderate inflammation begins. This commences to subside about the seventeenth day and by the thirtieth day a crust has come away, leaving a healed and apparently healthy surface. An alternative effect may be produced by a single application as above described but of twenty minutes' duration. Repetitions may be required to prevent recurrences. As an adjunct to radium in the treatment of recurrent cancer of the breast, the x ray, generally applied to the axilla and the front and back of the chest, is employed. Another is the x ray examination of the teeth where the seat of infection in cancer is frequently found in the form of dental abscesses. This should be treated with autogenous vaccines.

Miscellany from Home and Foreign Journals

Acute Congestion of Liver in Young Children.

R. Kaimondí (*Presse médicale*, November 19, 1917) describes a condition due to excessive feeding, lasting generally six to eight days, though ranging in duration in certain cases from forty-eight hours to three weeks, according to the promptness and stringency of dietetic treatment. The temperature varies with the degree of hepatic congestion, though occasionally, in the presence of constipation, slight fever persists for two or three days after the liver has returned to its normal size. The tongue is white and moist. Jaundice is never present, though there may be a slight subicteric tint. The spleen is never enlarged. Where the temperature has not descended to 37° C. morning and evening on three successive days, a relapse is always to be apprehended. Occasionally, where the liver is rapidly decongested by treatment, a rather sharp liver pain radiating to the right shoulder may be experienced for a few hours. A relapse is the rule when the return to a normal diet is made too rapidly. Recurrences are frequent in children with bulimia, or at least, a somewhat exaggerated appetite, as well as in children with inherited hepatic weakness. In some the condition persists till the age of six or eight years, though the attacks appear at increasingly long intervals. In the diagnosis, the relative abscess of vomiting and of diarrhea are important differential features. Careful palpation to ascertain the limits of the tender area together with examination of the stools, may be required to exclude recurrent chronic appendicitis. Acute hepatic congestion and chronic appendicitis may be simultaneously present after the second year of life. Treatment during the acute stage consists in purging once or twice with calomel, the dose being 0.02 gram from the sixth month to the first year; 0.05 gram each of calomel and powdered scammony from the first to the second year; 0.1 gram of calomel and 0.05 gram of scammony from the second to the third year, and after that, 0.1 gram of each remedy. The calomel should always be given at night, an hour and a half to two hours after a bottle of sweetened, boiled water. Next morning, a teaspoonful of castor oil is administered, followed after three hours by an enema, to be repeated daily thereafter throughout the febrile period. For a further antipyretic effect, a bath at 36° C. may be given, or a moist pack at 37°. Biliary or mixed opotherapy is also instituted, and powders of sodium bicarbonate, sulphate, and benzoate prescribed, to be taken with Vals mineral water. The diet consists of skimmed or buttermilk mixed with Vals water, together with vegetable bouillon, an infusion of powdered wheat embryos, kephir No. 1 or 2, or yogurt. After convalescence, fluidextract of boldo is administered. The prophylactic interval treatment consists in avoiding overfeeding in those with inherited hepatic weakness, a monthly calomel purge followed by semistarvation for one day, and a reduction of the intake of butter and sugar to a minimum.

Balantidial Colitis.—C. H. Manlove (*Philippine Journal of Science*, May, 1917) reports two cases, with clinical histories and autopsy reports. In one case there was a history of dysentery for approximately two months before death; in the other, the condition was detected only on routine examination, the patient succumbing to a mixed parotid tumor and epithelioma of the cheek. This case showed that, as in amebiasis, extensive intestinal lesions may be present in balantidiasis without causing symptoms. The intestinal lesions of the latter disease were observed to vary from a simple catarrh to deep ulceration. Organisms were abundant in the intestinal wall, with some resulting inflammation, and there was also a burrowing necrosis of the submucosa, similar to that of amebiasis. All parts of the colon may be involved. An etiological diagnosis can be based only on the discovery of the balantidia. Eosinophilia in sections of the intestine, emphasized by previous observers, was not prominent in Manlove's cases.

Comparative Results of Functional Kidney Tests.—B. A. Thomas and J. C. Birdsall (*Journal A. M. A.*, November 24, 1917) emphasize the need for definite information on the relative value of some of the more commonly used functional kidney tests by pointing out that uremia is the chief cause of death following operations on the genitourinary tract. The statistics from twenty-six hospitals show that the fatality from nephrectomy and prostatectomy done by general surgeons was twenty-six and 22.5 per cent., respectively, while it was only 7.7 and 4.3 per cent. in seven times as many cases in the hands of eight of the most noted urologists. Many have expressed opinions as to the relative merits of one or another functional kidney test, but in most instances comparative tests of several methods have not been carried out on the same patients. During the past two years the authors have subjected every patient who was suitable to each of the following tests: indigo carmin, phenolsulphophthalein, total nonprotein blood nitrogen, urea nitrogen of blood and urine, urine urea by sodium hypobromite method, Ambard's constant, blood creatinin, and cryoscopy of blood and urine. The results show that none of the tests surpasses the use of indigo carmin in value, this being both more trustworthy and more valuable than phenolsulphophthalein and the tests of retention. Where tests confirmatory of the indigo carmin test are desired the best are the phthalein test, total nonprotein nitrogen of the blood, or blood urea nitrogen. Ambard's coefficient is of questionable value in the differentiation of nephritis. Cryoscopy is valueless, and the results of blood creatinin and urine urea are so variable as to be untrustworthy. In the application of the indigo carmin test the best results are obtained by taking the time from the moment of injection, rather than from the first appearance of the dye in the urine. The index of its elimination should also be taken as a measure of the stability of the kidney function. This is the comparison of the quantitative excretion in the first and third hours.

Anal and Rectal Fistula.—J. Rawson Pennington (*Journal A. M. A.*, November 3, 1917) defines a fistula as an infected artificial channel between the skin and a normal cavity or between two normal cavities. In the case of the rectal and anal fistulas several classes of causes must be considered, but one of the most important and least appreciated is the presence of normal embryonic sinuses and diverticula extending out of the lower rectal wall. These channels are blind and often very narrow, are prone to harbor many organisms, and are the primary cause of many anal fistulas. Four stages can be distinguished in the development of a fistula: the prefistula stage, in which there is some form of rectal disease which predisposes to infection; the stage of infection, which includes the invasion of the tissues with pyogenic organisms; the abscess stage, in which the organisms form a pocket of pus in the tissues and continue to multiply with the extension of the abscess; and the fistula stage, which begins with the abscess breaking and discharging its pus. The treatment of fistula may be prophylactic, by the prevention or early treatment of rectal diseases and the keeping of the rectum in a clean and healthy condition. During the abscess stage the fistula may be aborted by simple opening of the abscess and the provision of free drainage. No further interference than this should be undertaken. Some fistulas can be cured by primary thorough cleansing with neutral chlorinated soda solution and injection with bismuth subnitrate ointment. Others can be cured by careful and complete excision of the entire fistulous tract and its immediate closure by suture. Finally it may be necessary to lay the tract open, dissect away the whole fistulous lining, obtain complete hemostasis, and close the wound by immediate suture.

A Histological Study of Fifty Uteri Removed at Cæsarean Section.—J. Whitridge Williams (*Bulletin of the Johns Hopkins Hospital*, November, 1917) presents some interesting conclusions, in that they are not in accord with certain current teachings, and show that some of the statements in textbooks concerning the third stage of labor are too arbitrary and general. No hard and fast rules can be laid down concerning the line of cleavage during this period, nor can they be made as to the amount of decidua which will be retained at the placental site or elsewhere in the uterus. In some cases cleavage occurs definitely in the spongy layer, and less often in the compact layer, and very frequently it is irregular, involving one layer in one place, and the other in other places, so it is not justifiable to teach that separation must take place in the spongy layer. Secondly, contrary to the generally accepted statement, Williams thinks that thrombosis is not a characteristic feature of the freshly delivered uterus, that when it occurs it is a secondary process incident to the cutting off of the circulation, and that it cannot be regarded as the prime factor in the control of bleeding. Forty per cent. of the specimens showed inflammatory changes, which seemed to demonstrate anew the dangers of conservative Cæsarean section when performed at any other but the optimal time, that is, at some date during the last days of pregnancy or within a few

hours after the onset of labor in patients who have recently been examined only by those who observe an appropriate technic. The cases studied indicate that the healing of Cæsarean section wounds is usually satisfactory, if the convalescence has been normal, and ordinarily there is no need for a repetition of the procedure, unless definitely indicated by the existence of extreme disproportion or some other condition. But if the convalescence has been abnormal, it is probable that the cicatrix will be greatly thinned out and will offer conditions favorable to rupture. To avoid this in these cases a repeated Cæsarean section may be necessary. Such patients should be kept under the closest observation during the last months of the next pregnancy.

Etiological Factors in Gross Lesions of the Large Joints.—Herbert C. Clark (*Journal A. M. A.*, December 22, 1917) made routine examinations of the large joints in a series of 1,100 consecutive necropsies on persons mainly of the laboring class and largely of the negro race. In 172 cases, or over fifteen per cent., definite gross lesions of the large joints were found, although less than one per cent. of those having them had been "arthritic suspects" during life. In 129 cases the lesions were of a chronic, degenerative type, and of these ninety-six showed evidences of syphilis and thirty-three of arteriosclerosis. Forty-three cases were of the common acute types of arthritis or showed ill defined combinations of acute and chronic types. The conclusion was reached that chronic vascular disease, both syphilitic and arteriosclerotic, combined with hard labor was an important etiological factor in chronic degenerative arthritis. Also, it was concluded that the occurrence of focal degenerative arthritis at autopsy was of some value as evidence of syphilis, and that appropriate laboratory tests should be applied in such cases.

Causation and Curability of Certain Albuminurias.—David Riesman (*Journal A. M. A.*, December 15, 1917) calls attention to a form of chronic nephritis with albuminuria which is often insidious and found in apparently healthy persons in the course of routine examinations. The same affection has also been classed among the cyclic or orthostatic albuminurias of adolescents. The features are those of a nonprogressive nephritis with small amounts of albumin, occasional granular and hyaline casts, and a normal phenolsulphonethalein excretion. Such cases usually show no obvious cause of the nephritis and albuminuria, but on careful examination there will be found to be some chronic focus of infection, such as the tonsils, kidney stone, etc., removal of which leads in a few months to complete recovery of normal kidney function with freedom from albumin and casts in the urine. Several illustrative cases are given, in one of which the infection was bronchial and the staphylococcus was isolated from the sputum. The administration of a vaccine cured both the infection and the nephritis. Dental abscesses are also very frequent foci of infection which lead to these forms of nephritis. While recovery follows the removal of all foci of chronic infection, its progress may cover several months, during which the irritation of the kidneys is being repaired.

A New Infectious Disease.—R. Rendu (*Presse médicale*, November 19, 1917) reports six cases of a condition characterized by inflammation of the conjunctival, nasal, buccopharyngeal, and preputial mucous membranes and at times an eruption of vesicles and blebs on the extremities. While an acute infection, the disease does not appear to be contagious. The inflammation of the orificial mucous membranes is characterized by superficial ulcerations with a tendency to suppurate or with a more or less heavy pseudomembranous exudate. The latter is only slightly adherent, but the underlying mucosa bleeds very readily. These lesions are most intense at the margins of the lids and meatus and on the inner surfaces of the lips and cheeks. In two instances anal involvement was noticed. The vesiculobullous skin eruption exhibited a purpuric tendency, but was observed in only two out of six cases. The disease is at times accompanied by albuminuria and nearly always by fever, at least in the beginning. Recovery takes place in three to six weeks. Differentiation from the ulceromembranous stomatitis of Bergeron is made by virtue of the bilateral situation of the lesions, the false membrane and absence of necrosis, the simultaneous involvement of the conjunctival, nasal, and genital mucosæ, and the fever, albuminuria, and skin eruption. Bacteriological studies by Costa and Troisier revealed a large number of bacterial species, including fusiform and spirillar organisms, pseudodiphtheria bacilli, diplobacilli, staphylococci, and streptococci, without a distinct or constant predominance of any of these. In polynuclear cells from the balanic ulcerations, groups of small bacilli, negative to Gram's, were observed in two instances; they could not, however, be successfully cultivated, even on blood agar.

Cardiovascular Disturbances Following Intoxication by Asphyxiant Gases.—J. Parisot and L. Tixier (*Paris médical*, November 10, 1917) consider the cardiovascular disturbances far more important from the standpoint of ultimate prognosis, in cases recovering from the initial pulmonary edema, than any tissue injury which the gases may produce in the lungs themselves. In the cases of intermediate severity, the circulatory manifestations run a definite, characteristic course. There is first a stage of tachycardia, with a pulse rate of 100 or 120 in the absence of fever, or of 130 or 140 with temperatures of 38° or 39° C. In two or three days this tachycardia passes off, along with the lung edema, and by the fifth or sixth day it gives way to bradycardia, with the pulse rate at 45 to 55 or sometimes lower, down to 32. Whereas the pulse in the first stage is strong, in the second it is small and soft. The bradycardia is, however, well borne by the patient, who shows no tendency to syncope or convulsions. It persists till the twentieth or twenty-fifth day in the more severe cases and till the twelfth or fifteenth in milder cases. It is of the total type, amyl nitrite always increasing the rate by forty to fifty beats, and is ascribed to secondary toxic depression of both the sinus node and the heart muscle itself. It is therefore to be grouped with the toxic bradycardias of uremia, jaundice, and lead poisoning. The third stage is marked, the pulse rate having returned to normal, by a persistent instability

of heart action, the rate reacting violently and for a prolonged period to muscular exertion. Slight extrasystolic arrhythmia is frequent in these cases, not, however, in the presence of either tachycardia or bradycardia, but where the rate is normal. Blood pressure studies showed in the first stage a distinct increase in the systolic pressure and a marked relative decrease in the diastolic. In the stage of bradycardia the systolic pressure is low and the diastolic relatively normal. Often the blood pressure returns to normal much more slowly than the pulse rate. Such subjects require prolonged rest and treatment. The high pressure and tachycardia of the first stage probably constitute a defensive reaction against obstruction in the lung alveoli. Later, systematic pulse and pressure estimations serve as a valuable guide to treatment. An excessive load on the heart should be relieved by venesection or wet cupping, and the organ supported with camphor in oil and sparteine. Caffeine is to be avoided, and perhaps also digitalis. Emetine should be administered in moderate doses. During convalescence, tests of the myocardial function afford direct information as to proper management of the individual case.

Cancer of the Rectum and Pelvic Colon.—

Jerome M. Lynch (*Journal A. M. A.*, November 24, 1917) reviews his experience of 491 cases of cancer in these regions and records the fact that only fifty-one died, while 253 recovered following radical excision, giving a mortality of sixteen per cent. Early colostomy is absolutely vital in inoperable cases for the relief it brings. There are many misconceptions of cancer of the colon and rectum as described in the textbooks. Thus the disease has no age limitations, having been found in the present series in children under nine years of age as well as in adults over eighty years old. More than half of the cases, however, occurred in the decades from forty to sixty years. The symptoms usually given are those of the very advanced disease and are misleading so far as early diagnosis is concerned. Cachexia is rare until the disease is far advanced. The diagnosis must rest very largely on thorough physical examination of every patient if it is to be made early. When the disease is in the rectum it can be seen or palpated, when higher up the bismuth shadow is of great help. The occurrence of hemorrhoids is very frequent in cancer cases, ten per cent. of those in this series having been operated upon for this condition shortly before the correct diagnosis was made. Twenty per cent. of the cases in this series were incorrectly diagnosed and had been treated for various gastric or enteric diseases by mistake. It must be borne in mind that cancer of the rectum and sigmoid remains stationary for long periods of time and that successful resection can be made in cases with very large tumor masses. The radical operation with removal of all involved tissues gives very good results and a large proportion of more or less permanent cures. In every case the attempt should be made to restore the anus to its original location, for even with some incontinence this is better than a colostomy. The best results are generally to be secured by the radical, combined perineal and abdominal method, done in one or two stages.

Proceedings of National and Local Societies

SOUTHERN MEDICAL ASSOCIATION.

Eleventh Annual Meeting, Held at Memphis, Tenn.,

November 12, 13, 14, and 15, 1917.

The President, Dr. DUNCAN EWE, of Nashville, Tenn., in the Chair.

SECTION IN MEDICINE.

(Concluded from page 95.)

Oral Sepsis and the Cardiovascular System.—

Dr. ALEXANDER G. BROWN, of Richmond, Va., drew the following conclusions: Focal infection of the mouth, chronic alveolar abscess, chronic pericementitis, acute and chronic infection of tonsils and other oral, nasal and other cavities adjacent, produced serious, grievous, and dangerous diseases of the heart, endocarditis, myocarditis, pericarditis, and pancarditis. Often unrecognized because of their slow, insidious progress, grave maladies of the heart were produced secondary to gross, filthy, offensive, and criminal disease of the mouth. Oral focal infection was the cause, occasion, origin of disease of important organs of the body which must be recognized by the medical profession, which must be impressed upon the laity, and which must in the future diminish and decrease as the profession instructed and the laity heeded the instruction that the care of human mouth and accessory cavities from focal infection, or the early eradication of oral infection, when present, was insurance against the occurrence of many dreadful systemic maladies. Thorough mouth inspection should be made on every new patient coming for treatment or diagnosis. Old patients, with recurrent diseases, whose condition we might feel we knew, should receive careful and painstaking mouth, nasal, and aural inspection searching for any possible storage of septic bacteria. Dentists must be impressed with the complete and accurate removal of every focus of primary infection, or else secondary metastases could not be improved or cured. Röntgen ray was necessary for detecting foci in roots of teeth, whether crowned or not, in bone of lower jaw; but the evidence of gum infection, tonsillar infection, salivary gland infection, must be determined by inspection and study by the diagnostician.

The Relation of Oral Sepsis to the Nervous System.—

Dr. E. BATES BLOCK, of Atlanta, Ga., said that he had under his care several epileptics in whom pyorrhœa alveolaris or apical abscesses existed. Ten other causes for epilepsy could be found after carrying out the usual methods of investigation, and in view of the absence of other discoverable causes and the results obtained, he was inclined to think them due to this focal infection. It must be said that other causes such as syphilis, brain diseases, worms, adherent prepuce, intestinal stasis, etc., were far more frequent causes of this disease. He would not like to be understood as asserting that pyorrhœa alveolaris was a cause of epilepsy, but he believed the subject was worthy of further thought and study.

He had recently had under his care a young woman, who had five boils on the posterior surface

of the thigh, followed in four weeks by spinal myelitis involving the corresponding portion of her spinal cord. The question naturally arose why, with so many cases of oral sepsis, should so few cases of nervous diseases be produced by it if it was indeed the cause of these diseases. If there was free drainage and the pus was freely discharged, it would seem to be a very different proposition from the cases in which blind abscesses existed or where the peridental membrane was destroyed and toxic absorption was great. With an intact peridental membrane there might be no toxic absorption at all. Although focal infections might be the cause of other diseases, the mere removal of the focal infection did not necessarily cure the secondary disease, as the infection might already have extended beyond the point of focal infection, and the best results were obtained by the prophylactic effect of the removal of the focal infection, or in cases where the secondary disease was produced by the toxins from the point of focal infection.

Oral Sepsis and Arthritis.—Dr. J. HEYWARD GIBBS, of Columbia, S. C., said that a proper investigation of the gingivæ, teeth, and alveolar processes must include röntgenographic studies. The important relationship of chronic pyogenic infections to a large group of the arthropathies had been conclusively demonstrated, and the first step in the management of these cases should consist in a systematic search for foci of infection. No one portal of entry for infecting microorganisms should be allowed to obscure the importance of investigating all possible sources of infection.

Wild Rats of the Southern States as Carriers of *Spirochæta icterohemorrhagica*.—

Dr. JAMES W. JOBLING and Dr. A. A. EGGSTEIN, of Nashville, Tenn., stated that their work had shown that hemorrhagic icterus was present in their community, and that about ten per cent. of the wild rats harbored the causative organism. This percentage of carriers among rats was relatively high and justified them in calling attention to the danger attached to work which brought the individual into more or less intimate contact with the habitats of these animals. This warning would certainly apply to soldiers receiving trench training in the South. In this country and in Europe the mortality had not been as high as that observed in Japan. This might be due to the fact that in Japan the organism had become more virulent because of a more rapid passage from man to man, the rat acting as the intermediate host. This was shown to be true when the organism was passed through several generations of guinea pigs, and the same would probably apply when the organism became accustomed to growing in human beings. It was possible that we now saw the evolution of a new epidemic disease.

Fundamentals in Vaccine Therapy.—Dr. ESTILL D. HOLLAND, of Hot Springs, Ark., said that where and when to use vaccine was not so definite, but the newer fields in which he had been using it with good results were in some cases of infectious arthritis, arthritis deformans, eczema, and psoriasis.

He had had good results in some cases of psoriasis and he was now treating an old man with an extensive eczema who would not respond to any other treatment than a mixed stock vaccine. This patient had been with him three times before. Every time he arrived he was nearly crazy with eczema; he could not wear a coat or a shirt that touched his neck; his arms were raw to the shoulders and his legs to the knees, and his eyes nearly shut. Doctor Holland prescribed a stock vaccine, as used in arthritis, and the patient was wearing a stiff collar in six weeks and did not have a trace of eczema on him in two months' time. He had also had some good results in injecting the sciatic nerve with vaccines in sciatica, but this he did not consider due to an immunizing effect of the vaccine, but to the consequent trauma of the vaccine reaction in and around the nerve. Stock vaccines should be used in all chronic cases where the disease continued, but in a less active state, and that autogenous vaccines were indicated in acute cases where each exacerbation was as active and pronounced as the previous one.

SECTION IN PEDIATRICS.

Classification and Treatment of the Acute Diarrheal Diseases in Infancy.—Dr. JOHN L. MORSE, of Boston, Mass., stated that diarrhea from an excess of fat in an artificial food was not at all uncommon. When the disturbance was a mild one the stools were not much changed in color, but contained many small, soft curds and some mucus, and were somewhat more acid in odor and reaction than usual. Sometimes they were gray and shiny and in other instances, when there was an excess of neutral fat, they were creamy in consistency and color. Sometimes they looked like curdled milk. In other instances they were bright yellow and had an oily appearance. They were seldom green, unless there was also a disturbance in the digestion of sugar. In the worst cases, they were watery and strongly acid and caused marked irritation of the buttocks. When this happened, the fat was in combination with the alkaline salts, especially sodium. As the result, there was a considerable loss of alkaline salts in the stools. A relative acidosis was thus produced with an excess of ammonia in the urine. The symptoms of acid intoxication might then develop. A high fever was not uncommon in these severe cases. The prognosis depended upon the severity of the symptoms, but was in general good, unless there was a marked acid intoxication.

The treatment consisted in the complete elimination of fat from the food. It was not enough to diminish it; it must be cut out entirely. In most instances it was advisable to give a cathartic in the beginning and to starve for twelve to twenty-four hours. In the cases with acid intoxication, bicarbonate of soda should be given in some way and a food containing considerable amounts of sugar, preferably in the form of glucose or maltose. In the less severe cases protein was usually well tolerated and the caloric value of the food, which was much reduced by the withdrawal of the fat, could be made up by increasing the amount of carbohydrates. Fat could usually be cautiously added again in a few days. How rapidly it could be added could only be determined by observation of the symptoms and examination of the stools.

Diarrhea was more often due to an excessive protein in human milk than to an excess of either fat or milk sugar. The protein was most likely to be excessive in the early days of lactation and at the time of menstruation. An excess of protein might also be due to excitement anxiety and nervousness, or to fatigue or lack of exercise. The diarrhea was usually not serious. The baby was ordinarily not very sick, and the temperature was but little, if at all, elevated. The stools were loose or watery, and often contained fat curds as the result of the increased peristalsis and the consequent interference with absorption. The stools were usually brownish yellow in color, but might be green. They often contained mucus. The odor was not characteristic; the reaction was alkaline or feebly acid. They were not irritating to the skin.

The most important element in the treatment of infectious diarrhea was the diet. The character of the diet depended upon the variety of the microorganism which was causing the disease. These microorganisms could be divided, as far as the determination of the diet to be used was concerned, into two groups: 1, the various forms of the dysentery bacillus and the other organisms, except the gas bacillus, which caused the disease; 2, the gas bacillus and allied organisms. The other organisms, although of many different varieties, were grouped with the dysentery bacilli, because as regards their growth and the production of toxic substances from protein and carbohydrate mediums, they behaved in the same way.

Malaria in Infants.—Dr. MORGAN SMITH, of Little Rock, Ark., stated that malarial infection was less frequent in the infant than in the child or adult. This was not due to any natural protection possessed by the suckling, but to the vigilance on the part of the mother to protect her baby from the bites of all insects. Until the runabout age was reached, the infant took his day naps and slept at night under a cheesecloth canopy or other similar protection. The discovery of a bite on her baby incited the mother to renewed efforts for its protection. Living under the same conditions, the infant was as liable to malarial infection as the other child or adult, and the closer the observation the more convincing became this statement. Malaria, whether occurring in the infant, older child, or adult was a serious disease, and demanded the most prompt recognition and treatment. A positive diagnosis could not be made except by blood examination. A negative blood examination did not exclude malaria; not one, but many and frequent specimens of blood, taken at different stages of the disease, should be made. A therapeutic diagnosis should not be made unless it was impossible to make a diagnosis by blood examination. The treatment of malaria in the infant did not differ from that employed in the child or adult.

Rheumatic Fever in Childhood.—Dr. JAMES D. LOVE, of Jacksonville, Fla., stated that the physician recognized rheumatic fever before the symptom complex was nearly completed and before the rheumatic cachexia was established. The physician most apt to make a tardy diagnosis of rheumatic fever regarded joint symptoms as an essential manifestation of the disease. Doctor Love could not too thoroughly impress the fact that while at one

time or another the rheumatic child would probably display evidence of joint involvement, this was by no means necessary and should be regarded as merely an incident in the course of the malady, Hutchinson aptly remarked that had rheumatic fever been primarily studied in children it would never have been called acute articular rheumatism. In addition to recognizing the protean manifestations of rheumatic fever, we must particularly bear in mind the extreme vulnerability of certain tissues to the action of rheumatic streptococcus. We might thus be able to detect an insidious invasion of this organism before the customary symptoms were displayed and before the patient had sustained irreparable damage. He knew of no more reliable danger signal than the so called growing pains of childhood, trivial in themselves but suggestive to the trained physician of the gravest possibilities. These growing pains were usually an expression of muscular or fascial rheumatism, and few greater responsibilities devolved upon us than of educating the public as to the significance of such pains. Of more than casual importance was the suggestion of Williams that the growing pains of girlhood were more significant than of boyhood. The explanation was that the less strenuous life of young girls rendered them less prone to pains induced by overexertion and muscle strain.

The general management of rheumatic fever must be influenced by our very inability to detect cardiac lesions in their incipency. A given case of the disease might be progressing in a manner seemingly satisfactory, yet no one could state positively that structural damage to the heart was not already in insidious process of development. Bearing in mind that an organ at comparative rest was less subject to infection than when fatigued, it was obvious that a prolonged period of rest in bed must be insisted upon for all children suffering from even slight attacks of rheumatic fever. Certainly in view of the imminent possibility of cardiac involvement, any case of rheumatic fever called for absolute rest for at least two weeks.

Present Attitude Towards Protein and Fat.—Dr. OLIVER W. HILL, of Knoxville, Tenn., said that when possible, one should gradually increase the bovine protein as the educative process progressed, until a quantity equal to, or somewhat greater than, that found in human milk has been reached, for the reason that the principal problem was to get the child to assimilate a sufficient amount of protein to cause a consistent gain in connective tissue and muscular strength. We must always be guided by the digestive powers of the patients under consideration, and not by what the books said of calories and percentage. Protein had been grossly misunderstood from the standpoint of normal physiology. It was as much influenced by the individual tolerance or susceptibility as was either of the other food elements. We were learning something of the position of this element and were recognizing the fact that after all was said that we knew, and much that we must conjecture, more depended in the management of the case and the manipulation of the food than in the food itself as to how we succeeded, because a given protein, whether cow's milk, or human milk, was practically the same under all

circumstances as to chemical constitution, digestibility, etc. Most failures of feeding were not due to the food but to the feeder.

The Role of Carbohydrates in Infant Feeding.—Dr. O. H. WILSON, of Nashville, Tenn., stated that granting one had the proper appreciation of the dangers and difficulties of fat, the adaptation and dose of the carbohydrate was the determining factor in finding the proper food. Carbohydrate was the only element we could modify qualitatively. Normal babies could take with equal benefit any of the three forms of sugar. Lactose seemed to suit very young babies better. Cane sugar suited older babies as well as any form. Malt sugar was indicated when others failed to produce a sufficient gain, or when malassimilation of fat was evident. The adjustment of the carbohydrate to a difficult feeder was an individual problem. Starch waters were valuable chiefly through their colloidal action. An attempt to give enough to displace sugar was disastrous. If a baby had the same trouble taking care of sugar that Doctor Wilson had had trying to assimilate the confusing, contradictory, indigestible literature on the subject he was sure he would cut it out altogether.

Eczema in Infancy.—Dr. F. P. GENGENBACH, of Denver, Colo., summarized as follows: Eczema was a dermatitis due to many internal and external causes, some of which were still unknown and were included in the broad term predisposition. The principal internal cause, aside from the so called predisposition, was a food intoxication or sensitization, usually combined with faulty elimination. The external causes included all forms of irritation whether mechanical, chemical, or bacterial. The treatment consisted of the discovery and removal of the cause or the causes and the relief of the symptoms.

THE AMERICAN LARYNGOLOGICAL ASSOCIATION.

Thirty-ninth Annual Meeting, Held at Atlantic City, N. J., May 28, 29, 30, 1917.

The President, Dr. JOSEPH L. GOODALE, in the Chair.

(Continued from Vol. CII, page 1243.)

Removal of Foreign Bodies from the Larynx, Disproving Previously Made Diagnoses.—Dr. HILL HASTINGS, of Los Angeles, believed that the rapidly growing use of direct laryngoscopy was showing up many incorrect diagnoses, especially in children, where foreign bodies were found in the larynx and trachea.

In the case of a child, aged seventeen months, sick for a week with "croup," with gradually increasing obstruction to breathing, there had been slight respiratory obstruction and a little fever, 100.6° F. being the highest. The baby was breathing with audible roughness, but without cyanosis and without any considerable difficulty. The possibility of foreign body impaction was suggested. On crying the dyspnea increased and some cyanosis was observed, which subsided quickly when the child again became quiet. Indirect laryngoscopy was a failure. The x ray examination was neg-

ative. The child's obstruction grew gradually worse, and it was finally decided to do a tracheotomy. With Jackson's small sized laryngeal speculum, a piece of eggshell was found embedded in the larynx, between the cords, protruding into the glottis. The eggshell was easily removed. Convalescence was uneventful. The tracheotomy tube was not removed for three or four days because of the difficulty in breathing that resulted on attempts to do without it, which supported the contention that a preliminary tracheotomy was advisable.

In another baby, sixteen months old, the only history obtained was that the illness dated back fifteen days to a choking spell that occurred while the child was sucking a piece of mutton chop bone. Foreign body impaction was at once suspected. Immediate tracheotomy was done without anesthetic. The patient was practically unconscious from the deep cyanosis. On opening the trachea, immediate relief was obtained and the acute pigeon breast, tumorlike appearance at once disappeared. The end of a piece of bone was felt at the tracheal opening. A large, rather thick sliver of bone about one inch long, sharp at its upper end, firmly impacted above in the larynx, was removed by forceps. The child's fever and considerable purulent discharge and cough continued for a few days. Recovery was complete, and the patient was discharged on the sixteenth day.

Dr. HARMON SMITH, of New York, spoke of a child six years of age, treated by six different doctors for diphtheria with antitoxins and intubation on two occasions, and finally sent to him by a nose and throat specialist to remove a papilloma of the larynx. As Doctor Smith was about to operate he saw the tip end of a safety pin in the anterior commissure, wedged in between the two vocal cords. After its removal there was no further trouble.

External Surgery of the Superior Maxilla in Treatment of Nasal Disease.—Dr. JOHN F. BARNHILL, of Indianapolis, said that the attack upon nasal tumors of the nostril and its environment depended to some extent upon surgical training and the ability of the operator to locate accurately the origin of the growth. In case the origin is the ethmoid, turbinates, septum, or one of the walls of the nostril, the symptoms of early obstruction would cause the patient to consult the rhinologist, who either from tradition or belief in its greater efficacy, would almost without exception attack from within. If, however, the growth began outside of the nostril, the general surgeon often saw it, usually at a late stage, and attacked it by external methods universally approved by his branch of the profession. Rather frequently malignant disease of the upper jaw attacked the alveolar process first, and since the earliest symptoms were referred to the teeth, the patient was first seen by the dentist who treated the teeth and even extracted healthy teeth in the belief that the disease was in some way connected with dental surgery. Rhinologists have often cauterized and snared at malignant growths in the nose whose undoubted seat must have been in some distant part of the maxilla, while on the other hand the general surgeon had been guilty of removing the entire upper jaw for a disease that had its origin in the

nose or in the party line between the nose and antrum.

While the statistics of the rhinologist were probably better than the statistics of the general surgeon in the treatment of malignancy of the nose and its environment, these statistics were not entirely fair to external surgical methods. The length of time a malignant tumor had progressed prior to the operation had much to do with the end results of most operated cases. The rhinologist and the dentist saw malignancy of the maxilla earlier than the general surgeon. Sarcoma or carcinoma developed symptoms of distress much earlier when originating in the nose or alveolus than when the origin was in the antrum. Antrum malignancy might progress many weeks or even months before there was external or nasal swelling and before pressure symptoms caused pain. A candid view of the facts concerning the surgery of the upper jaw for malignancy was not altogether encouraging. External surgery of the maxilla was essential, usually more essential, to cure than intranasal surgery. The rhinologist who pretended to do radical intranasal surgery should prepare himself to follow surgical disorders leading from the nose to any part of the upper jaw, or to wherever they might lead. When this was done, and when the diagnosis was made earlier than at present, great improvement of statistics may be expected. All textbooks undoubtedly laid too much stress on total excision of the maxilla apparently because it was assumed that the disease had always advanced to a point that involved the whole upper jaw, or that any procedure short of total excision was inadequate. One of the chief objections to external surgery of the maxilla has been the deforming scars, the misplaced eye, and the palatal defects that result. Early and definite diagnosis as to the seat of the beginning of the growth, and an early studied plan of operation, would very largely avoid this objection.

Doctor Barnhill had seen but four cases of undoubted malignancy whose origin was within the nostril. Three of these cases were sarcoma, one epithelioma. All were operated intranasally, with recovery in the case of a spindle cell sarcoma of the inferior turbinated body. In two cases with later extension to the ethmoid and antrum, external operation was done, one patient dying within about one year and the other within eighteen months. In one case the condition returned in the nasopharynx and was extending so rapidly that the patient lived but a few weeks after the onset of the nasal ailment.

Dr. JOSEPH H. BRYAN, of Washington, expressed himself as in favor of external surgery in these cases. In an exaggerated fibromatous condition in one case the face was enormously distorted and the eye greatly displaced, and it was clearly impossible to remove it intranasally. He did the Moore operation and was greatly pleased with the facility which it afforded for the complete removal of everything within the maxillary antrum, and also the facility with which it aided the removal not only of the growth in the antrum, the whole nasal wall, including the superior middle and inferior turbinate bodies. In this case, unfortunately, the under surface of the wound became infected and broke down

It healed thoroughly, and while the scar was somewhat on the lower border, it was more than a good result under the circumstances. He believed Moore's operation was by far the best operation for complete eradication of all these growths within this cavity.

Dr. BRYSON DELAVAN, of New York, referring to the treatment of nasopharyngeal fibroma, said that except in cases where the growth involved the sinuses to such an extraordinary degree that it was not practical to apply the treatment, the thirty year old method of removal by electrolysis had never been improved upon. He had never heard of a death from this plan of treatment. Radium could not be brought into communication with the growth. In those cases the best plan was to open the maxillary sinus, and the best avenue of approach seemed to be through the roof of the mouth, which enabled the application of the radium to be made.

Dr. HANAU W. LOEB, of St. Louis, referred to a case he reported a number of years ago in which the tumor was removed by the electric cautery, and in which the hemorrhagic tendency was tremendously reduced by using the electrolysis method. He also called attention to the ease of going into the nasopharynx by removing the posterior portion of the palate, as he did in a case of carcinoma in the epipharynx not yet reported.

Doctor BARNHILL, closing the discussion, said that if the disease could be demonstrated in the floor of the nose or on the septum, it then seemed electrocauterization was justified. If, however, the disease had begun in the nasointral wall, in the alveolus and spread to the nose, in the antrum and spread to the nose, or in the ethmoid and spread to the nose, the rhinologist should either send this patient at an early date to a surgeon, or, if he was himself qualified to deal surgically with it, he should do so. It was possible, with skill, judgment, care, and patience, to make a diagnosis early enough and operate in time to cure many of these patients.

(To be continued.)

Letters to the Editors.

THE COMMUNICABILITY OF PNEUMONIA.

NEW YORK, December 27, 1917.

To the Editors:

The communicability of pneumonia is beginning to receive the attention which the importance of the subject deserves. In a paper on the communicability of poliomyelitis which appeared in *American Medicine*, October 1916, I cited a few cases that had come under my observation, which demonstrated the communicability of pneumonia, and in discussing the relative communicability of poliomyelitis and pneumonia, went on to say: "Here we have a distinctly communicable disease, which during the present year was more prevalent than poliomyelitis, which caused twice as many deaths—lobar pneumonia, 4,621; poliomyelitis, 2,286—but the patients were not strictly isolated, only a small proportion were sent to hospitals, and there they were not isolated in a separate ward; no restrictions were placed on contacts, there was no definite period of quarantine, and the patients were discharged, without making cultures to show the absence of virulent pneumococci. Although at present it might be difficult to carry out all these procedures, if we wished to be consistent, we ought to carry out some of them."

It has been suggested that only cases of lobar pneu-

monia should be reported, isolated, and controlled. I believe this would be a mistake, for several reasons. In a certain percentage of cases, it is very difficult to determine whether we are dealing with a lobar or a confluent lobular pneumonia, and there are atypical and mixed types. A bacteriological examination is made in only a small percentage of all cases. There is no reason to suppose that the pneumonias associated with streptococci, staphylococci, or the influenza bacillus are less communicable than those due to pneumococci. If only the cases of lobar pneumonia were reportable, it would be a very simple matter, if a physician failed to report a case, to say that it was a lobular pneumonia. During the recent epidemic of measles at Camp Wheeler, seven per cent. of the cases were complicated by pneumonia, and nearly one half of the deaths from pneumonia were in patients who had just had measles. The communicability of this secondary pneumonia was recognized. At this season of the year when pneumonia is prevalent, it would not be difficult for the hospitals to reserve one ward or room for the treatment of pneumonia patients.

Yours truly,

CHARLES HERRMAN, M. D.

Book Reviews.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

A Treatise on Diseases of the Skin for Advanced Students and Practitioners. By HENRY W. STELWAGON, M. D., Ph. D., Professor of Dermatology in the Jefferson Medical College; Consultant to the Dermatological Department of the Philadelphia General Hospital; Member of the American Dermatological Association, etc. Eighth Edition, Revised. With 356 Text Illustrations and 33 Colored and Half-tone Plates. Philadelphia and London: W. B. Saunders Company, 1916. Pp. 1309. (Price \$6.50.)

A Treatise on the Diseases of the Skin by Doctor Stelwagon has now appeared in the eighth revised edition, substantially improved in text and illustration. The characteristic clearness of the text throughout makes the book unusually readable and intelligible even to those for whom diseases of the skin are not a specialty. The limitation of the work lies perhaps chiefly in its conservative, essentially topographical, rather than genetic, mode of approach. Though in this way something is no doubt gained by keeping to the familiar field, there is a corresponding loss of large leading and perspective. The wider aspects of trophic control through nervous and endocrine action are ignored and therefore the etiological discussions seem at times unduly stiff and topical. On the other hand it is perhaps quite likely that for the present a general textbook should not venture freely on to a ground where matters are so much in question and where opinion as yet so largely holds the place of commonly accepted fact. The book may therefore be acceptably received on its face value and for its general clarity and serviceability.

L. S.

Practice of Medicine. A Manual for Students and Practitioners. By HUGHES DAYTON, M. D., Associate Attending Physician, New York Hospital; Attending Physician, Hudson Street Hospital; Formerly Instructor in Physical Diagnosis, Cornell University Medical School. New York. Third Revised Edition. Philadelphia and New York: Lea & Febiger, 1917. Pp. 326. (Price \$1.50.)

The third edition of this compendium is marked by a material revision with the inclusion of many of the newer diagnostic methods and a brief outline of acute anterior poliomyelitis. The work has been brought up to date in most respects, but it is striking to note that under the discussion of diseases of the heart almost no mention is made of auricular fibrillation as a clinical entity. It is to be found under the caption, "Nodal Arrhythmia, Ventricular Form of Venous Pulse, or Permanently Irregular Pulse." This paragraph is curiously out of harmony with modern knowledge, for it describes the probable origin of the

stimulus as being at or near the auriculoventricular node, whence it travels in both directions, "so that ventricular systole is contemporaneous with auricular, or precedes it by a short period. It is more generally attributed to auricular fibrillation." We now know that true nodal arrhythmia is very uncommon and that the perpetually irregular pulse is almost wholly due to fibrillation of the auricles which has nothing to do with the presence of a nodal stimulus. Further, it is stated that "it occurs in paroxysmal tachycardia," but the context does not make it clear whether the author is referring to nodal rhythm or to auricular fibrillation. It makes little difference, however, for neither occurs in paroxysmal tachycardia, although auricular fibrillation may follow such tachycardia. The author's weak point seems to be the heart, for in the discussion of mitral stenosis he distinctly implies that an irregular pulse, in both force and rhythm, is quite characteristic "in the early stage" (italics his). He also says that this irregularity of the pulse is associated with a rough, crescendo presystolic murmur; an association which is in point of fact extremely uncommon, for when fibrillation sets in the presystolic murmur almost invariably disappears. There are other points of weakness in the book, but as it is obviously intended as an epitome for ready reference these do not much matter, for one would scarcely be expected to rely upon the work for guidance in the diagnosis or treatment of a patient. In fairness to the author it should be said that, considering its size and the vast amount of material from which he had to draw, he has given a very presentable résumé of the more important features of most of the diseases which he discusses.

Physical Remedies for Disabled Soldiers. By R. FORTESCUE FOX, M. D., Honorary Medical Director of the Red Cross Clinic for the Physical Treatment of Disabled Officers. With Chapters by Major R. TAIT MCKENZIE, R. A. M., Professor of Physical Education and Physical Therapy at the University of Pennsylvania; FRANCIS HERNAMAN-JOHNSON, M. D., Senior Medical Officer to the X Ray, Electrical and Massage Department, Cambridge Hospital, Aldershot; Consulting Radiologist, Aldershot Command, and JAMES B. MENNELL, M. A., M. D., Civilian Medical Officer in Charge of the Massage Department, Military Orthopedic Hospital, Shepherd's Bush; Medical Officer to the Physico-Therapeutic Department, St. Thomas's Hospital. New York: William Wood & Company, 1917. Pp. xiv-277. (Price \$2.75.)

The great war has brought forth many advances in methods of treatment, but none has been of greater moment than those which have to do with the restoration of function among the disabled and more or less crippled victims of wounds. The work which is being done in England and France in this reclamation of men is truly remarkable, and the measure of ultimate success has far surpassed the most optimistic expectations. This restoration has been due in part to the many improvements in surgery which have permitted the saving of limbs that would otherwise have had to be sacrificed to spare the lives of their bearers. Even greater has been the influence of the various physical remedies upon the successful restoration of function. The methods employed have included the various hydrotherapeutic measures, with some new developments in this field: all forms of mechanical measures, as massage, passive movement, active and resistance movements, and exercises; and all forms of electrotherapy and radiation. It was Fox's purpose to outline these several measures, to indicate the results which they might be expected to give, and to set forth some, at least, of the indications for their use as well as some of their shortcomings. All of this he has done, and done well, in the small volume at hand. He has also given excellent working descriptions for the establishment and conduct of hospitals, dispensaries, and camps in which the measures may be carried out with numbers of men at one time. He has not attempted to enter into any detailed discussion of how each of the methods employed accomplishes its results, for such would have been impossible in a book twice the size of the present. It has been his good fortune, however, to produce a most excellent small guide for the use of physical remedies which should go a long way to extend their use and make them available for both the civil and military population. The results cited by him stimulate interest and should prompt further investigation of the possibilities of the methods.

Births, Marriages, and Deaths.

Married

CREAMER-HORNE.—In Boston, Mass., on Wednesday, January 2d, Dr. William H. Creamer, of Falls River, and Miss Elizabeth G. Horne.

PERRY-FULLER.—In Suffield, Mass., on Sunday, December 30th, Dr. Sherman Perry, of Tewksbury, and Miss Bessie Young Fuller.

KELLOGG-STAINES.—In Grand Rapids, Mich., on Tuesday, January 1st, Mr. W. K. Kellogg and Dr. Carrie S. Staines, of Battle Creek, Mich.

Died.

ATKINSON.—In St. Louis, Mo., on Monday, December 31st, Dr. Robert C. Atkinson, aged seventy-six years.

BELLEVILLE.—In Delaware City, Del., on Sunday, January 6th, Dr. Frank Belleville, aged sixty-five years.

BROWN.—In New Orleans, on Monday, December 31st, Dr. J. Maurice Brown, of San Antonio, Texas, aged forty-five years.

CROTHERS.—In Hartford, Conn., on Sunday, January 13th, Dr. Thomas D. Crothers, aged seventy-six years.

FARNUM.—In Portland, Ore., on Monday, December 31st, Dr. Mary L. Farnum, aged fifty-five years.

FERGUSON.—In Huntington, W. Va., on Friday, January 4th, Dr. Napoleon B. Ferguson, aged sixty-five years.

FUDGE.—In Spring Valley, Ohio, on Wednesday, January 2d, Dr. Joseph G. Fudge, aged fifty-three years.

GARNER.—In Maryville, Tenn., on Monday, December 24th, Dr. Jephtha D. Garner, aged eighty-six years.

GOODWIN.—In Monticello, Ind., on Wednesday, December 12th, Dr. Grant Goodwin, aged forty-one years.

HAVEN.—In Lake Forest, Ill., on Thursday, January 3d, Dr. Alfred C. Haven, aged sixty years.

HERVEY.—In San Jose, Cal., on Thursday, December 27th, Dr. Charles H. Hervey, aged sixty-three years.

JACKSON.—In New York, N. Y., on Thursday, January 3d, Dr. Moses J. Jackson, aged sixty-nine years.

KEOUGH.—In Elizabeth, N. J., on Thursday, January 3d, Dr. John W. Keough.

KILMER.—In South Bend, Ind., on Friday, December 28th, Dr. Samuel L. Kilmer, aged sixty-nine years.

LANIER.—In Claybrook, Tenn., on Tuesday, January 1st, Dr. John H. Lanier, aged seventy-eight years.

LARUE.—In Putnam, Conn., on Friday, December 28th, Dr. Omer LaRue, aged sixty-eight years.

LOWRY.—In Valley Falls, Kans., on Monday, December 31st, Dr. Albert D. Lowry, aged forty-two years.

MADDUX.—In Chester, Pa., on Thursday, January 3d, Dr. Daniel P. Maddux, aged fifty-six years.

MARTIN.—In Burlington, Vt., on Friday, January 4th, Dr. Edward F. Martin, of Middlebury, aged fifty-seven years.

MARTIN.—In Cowlesville, N. Y., on Thursday, January 3d, Dr. William Nelson Martin, aged eighty years.

MITCHELL.—In Baltimore, Md., on Friday, December 28th, Dr. Charles W. Mitchell, aged fifty-nine years.

MONROE.—In Chicago, Ill., on Thursday, January 3d, Dr. James A. Monroe, of Chenoa, aged seventy-five years.

MOORE.—In Columbia, S. C., on Friday, January 4th, Dr. Robert L. Moore, aged forty-four years.

PEARSON.—In Philadelphia, Pa., on Saturday, January 5th, Dr. John S. Pearson, aged sixty-four years.

RAUSCHKOLB.—In Columbus, O., on Thursday, January 3d, Dr. Charles Rauschkolb, aged fifty-six years.

SANDERS.—In Montgomery, Ala., on Wednesday, January 2d, Dr. William Henry Sanders.

SHERRICK.—In Monmouth, Ill., on Friday, December 28th, Dr. Chauncey Sherriek, aged sixty years.

STAUB.—In Pittsburgh, Pa., on Thursday, January 3d, Dr. Franklin B. Staub.

THATCHER.—In Dallas, Tex., on Monday, December 24th, Dr. Winthrop F. Thatcher, aged seventy-one years.

TORREY.—In Beverly, Mass., on Tuesday, January 1st, Dr. Samuel W. Torrey, aged seventy-five years.

VINNEDGE.—In Chatham, N. J., on Friday, December 28th, Dr. William W. Vinnedge, of Lafayette, Ind., aged seventy-one years.

WHITLESEY.—In St. Louis, Mo., on Monday, December 24th, Dr. Granville E. Whitlesey.

New York Medical Journal

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NEW YORK, SATURDAY, JANUARY 26, 1918.

WHOLE No. 2043.

Original Communications

THE COMPLETE CLINICAL CHART.

BY SOLOMON SOLIS COHEN, M. D.,
Philadelphia,

In the effort to make a concise record of cases of lobar pneumonia treated by what I have termed "the definite method" (1), there has gradually been evolved a clinical chart, which is now brought to the attention of physicians in general. It will serve as a complete clinical record of nearly all classes of cases, medical or surgical. It has been called The Complete Clinical Chart (see Fig. 1), under which name it can be obtained from the Hospital Standard Publishing Company, 31 South Howard Street, Baltimore, Md., bearing the name of any hospital which may install this system of recording, and at quite reasonable rates, since the expense of making the plate has already been defrayed, and all personal and private rights have been waived. Charts can also be obtained with a different set of headlines for cases treated at the patient's home.

The main features of the chart are: 1. It provides in a way which nurses cannot misunderstand, for the recording at the proper place and without disfiguring the chart, of all important measures of treatment or other notes of significance. 2. It provides for the record not only of temperature, pulse frequency, and respiration frequency, but also of systolic and diastolic blood pressure, without confusion of curves, overlapping of numerals, or break in the continuity of numerals. There is one continuous line of numerals which, with their corresponding horizontal lines, can be utilized for the record of any and all of the curves mentioned. This is especially convenient in recording cases of lobar pneumonia and in guiding their treatment by the definite method; but its advantage is not confined to this condition or any special therapeutic plan.

In pneumonia, it shows at a glance both the relation of the systolic pressure to the pulse frequency according to the method of Gibson, of Edinburgh—the *Gibson pressure-pulse ratio*—and that of the diastolic pressure to the respiration frequency—the *pressure-respiration ratio*—on which the writer has laid stress in the paper cited. Fig. 2, reproduced from that paper, will serve to recall attention to the significance of these curve ratios.

In using the chart, for the record of pneumonia, for example, the administration of agents affecting the *temperature*, or whose effect upon the temperature is a guide to their use, is indicated by a symbol

placed at the top of the temperature division of the chart. Thus, in the partly diagrammatic illustration (Fig. 1) a plus sign in this division of the chart indicates the intramuscular injection of one gram of quinine and urea hydrochloride, the same symbol with .5 to the right and below, indicating the injection of one half gram. A plus sign inside a capital V indicates the intravenous injection of one gram of the quinine salt; and the same symbol with .5 to the right and below, indicates that the quantity injected was one half gram. Similarly, a plus mark with a circle around it and .6 to the right and below, indicates the administration of 0.6 gram of quinine and urea hydrochloride by mouth.

In like manner, various symbols placed in the *pulse* division, and conveniently at the top thereof, indicate remedies given to affect the pulse frequency or the *systolic blood pressure*, or whose use is guided by the height of the curves mentioned. In the illustration, the double dagger indicates the intramuscular injection of two mils of a twenty per cent. solution of camphorated oil. Any deviation from this standard quantity would be indicated by the appropriate numeral to the right and below, just as in the case of the quinine and urea hydrochloride. A triangle indicates the intramuscular injection of one mil of a posterior pituitary preparation, and a triangle with a dot in the centre indicates the use of the pituitary preparation intravenously. The notation of .5, in the same way as in the other cases, indicates 0.5 mil.

Medicaments given to affect the *respiration* frequency or the *diastolic blood pressure*, or whose use is guided by the height of these curves, are recorded in the respiration division, or, if more convenient, just above it, as in the illustration. For example, a circle represents inhalation of oxygen, and a capital D indicates the hypodermic injection of the standard dose of a digitalis preparation—in this instance, twenty minims of digalen. Variation from the standard would be indicated in the same manner as in the other cases mentioned. Capital D with the numeral 4, the whole surrounded by a circle, indicates the beginning of the administration of a digitalis preparation by the mouth—twenty minims U. S. P. tincture—every four hours; and the withdrawal of it is indicated by a multiplication sign.

Referring to the bottom of the sheet where the symbols are explained, it will be noticed that the simple plus sign, the double dagger, the triangle, the

multiplication sign, and the circle have been printed; while the D, the enclosed plus signs, the plus sign inside a V, and the triangle with dot, are written in one of the blank spaces left for such purpose. Similarly, if we were making the record of a case of typhoid fever, for example, and had used up all the other symbols and wished to record a hemorrhage or a section for perforation, we might write in the letter H to indicate the former, and the letter S to indicate the latter.

There are two other printed signs, a square and an asterisk, which have not been utilized in the illustration. These could have been chosen, had we so wished, in place of some of the written symbols. In other words, the printed symbols and any others adopted extemporaneously may be used as desired to indicate anything that in any particular case or class of cases is considered of sufficient importance for the permanent record. A certain consistency in the choice of symbols develops in the course of one's personal experience; e. g., the modification of the symbols for quinine and pituitrin to indicate intravenous or oral use.

In some hospitals, nurses have the habit of writing on the chart the administration of enemas and the occurrence of chills. If it is desired to record these, the nurse can be told simply to write the letter E in an appropriate place on the chart, with the ex-

ward Men's Med. Bed 8
Provisional Diagnosis { acute Leber }
Revised Diagnosis { pneumonia }
Model to follow I Type II.
Result Recovery

JEWISH HOSPITAL PHILADELPHIA COMPLETE CLINICAL CHART (DESIGNED BY S. SOLIS COHEN M. D.)

Service of Dr. S. Solis Cohen
Internic Dr. N. Goldberger
Admitted Feb 5 1916
Discharged Feb 28 1916
(Autopsy No. 191)

Register No. A 536 Name Abram Miller Age 99 Sex M Occupation Janitor

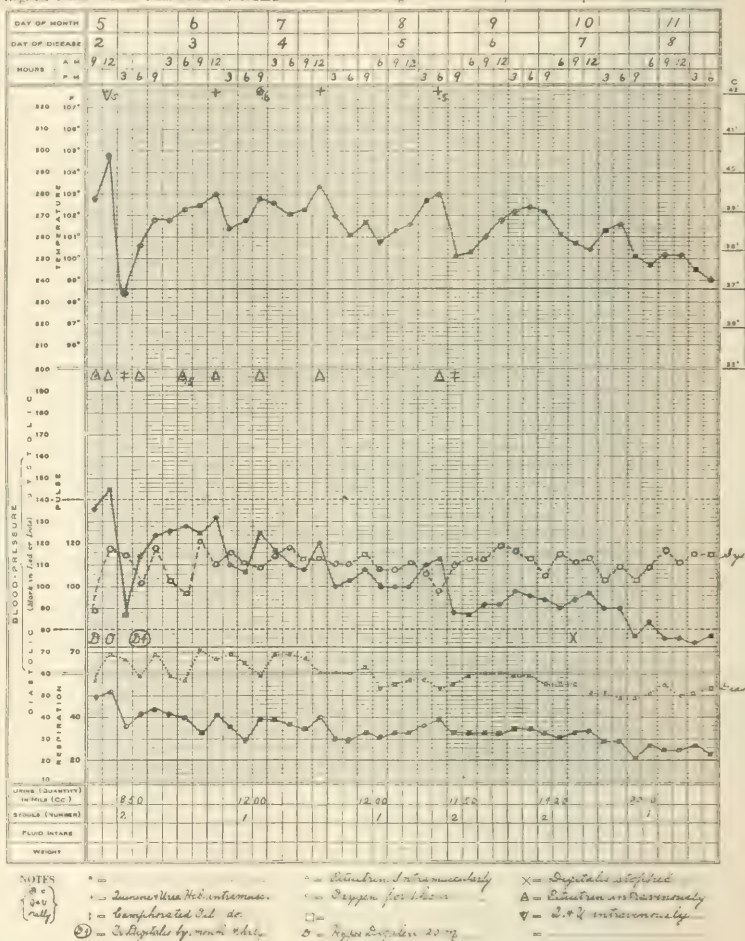


FIG. 1.—Complete clinical chart: The curves are based upon an actual case, but the chart as given is partly diagrammatic in order to bring out the various points mentioned; that is to say, all the therapeutic measures recorded for illustration were not employed in this particular case. The curves of systolic and diastolic blood pressure are best recorded in red, with open circles joined by dotted line for one, and solid circles or dots, joined by solid or broken line for the other. In the illustration, however, dotted black lines with open circles are used for both pressure curves, for typographical reasons.

planation in the notes, "E=enema"; and to indicate the chill by the letter C at the top of the temperature division, at the proper hour, with the explanation "C=chill" in the notes.

The columnar divisions of the chart are such that it can be used for morning and evening records daily, or for records at two hour, three hour, four hour, or any other periods desired. The illustra-

tion uses a three hour period, omitting periods at which the patient was allowed to sleep undisturbed by counting of pulse or taking of temperature. The other features of the chart scarcely call for comment, being simply the provision of spaces above for the record of the broad features of personality and case, and the ordinary provision below, for the record of stools and urine, fluid intake, and weight. These can be modified in any way desired. Thus, for use at a patient's home, the references to hospital history, as number, autopsy, etc., would be omitted; and the diagnosis need not be entered until the record is filed.

It is only after using a chart of this kind for some

FURTHER CONTRIBUTIONS TO THE TREATMENT OF ACUTE AND CHRONIC ARTHRITIS WITH RADIOACTIVE WAVE ENERGY.

BY ERNEST ZUEBLIN, M. D.,
Cincinnati,

Associate Professor of Medicine, University of Cincinnati; Medical Director, Cincinnati Tuberculosis Hospital.

In the course of former studies of radioactive substances applied to diseased joints which were affected with acute and chronic arthritis I reported my favorable results (1). My tests of these radioactive substances (2) suggested the possibility of

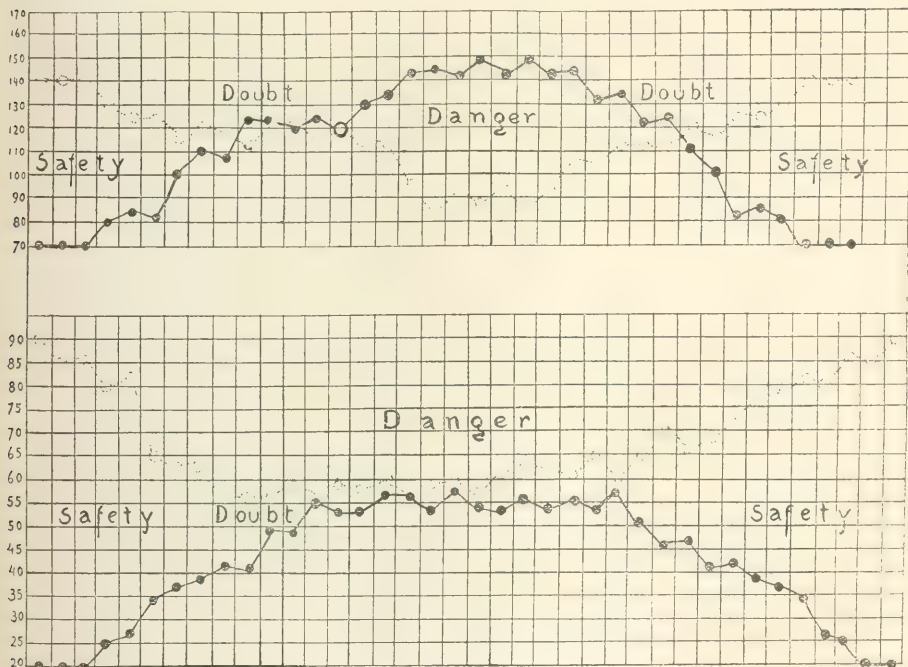


FIG. 2.—Diagram showing Gibson's pressure-pulse ratio and its significance (upper chart); and author's pressure-respiration ratio and its significance (lower chart).

time, that one comes to appreciate fully its advantages both at the bedside and in later study; as well as the space that it saves in the filing of records. The one sheet of paper contains everything of importance for ordinary purposes, and the progress of the case, the use and effect of remedies are visible at a glance. Intimate details of daily progress, if necessary for any special purpose, can be got at from the hospital files or in private cases from the nurses' records. The chart as it stands is especially valuable for the preservation over a series of years of comparable records of the effect of certain forms of treatment in a special group of cases.

REFERENCE.

1. SOLOMON SOLIS COHEN: NEW YORK MEDICAL JOURNAL, June 3 and 10, 1916, ciii.

applying larger amounts of radiating energy upon the diseased organs (3). For that purpose I designed an apparatus consisting of two specially constructed electrodes. The patient is placed in the path of the electric wave energy, then one of the electrodes is applied directly over the diseased organ. These experiments started about three years ago and are still in progress. Conducted in cases of chronic sciatica and acute and chronic arthritis, they have yielded satisfactory results so that a caustic report of my clinical experiences seems of interest.

The following case histories observed on hospital and private cases will precede the final remarks:

CASE I.—Mrs. M. W., forty years old, from Cockeysville, Md.; married; seven children; husband living and

well. Family history was negative regarding rheumatism, tuberculosis, malignancy, and mental diseases. In 1885 she had tonsillitis, and since then frequent attacks of sore throat, in 1890, scarlet fever, typhoid measles and mumps; 1907, first attack of rheumatism, since when patient had frequent pains in her joints. At that time she was confined to bed for four weeks, with all joints involved. In 1913 the first recurrence was observed with considerable involvement of her knee and feet, which gradually cleared up. Three attacks occurred in the spring of 1914 of similar nature. In 1915 pleurisy, and about March 10th the present swelling of all joints, edema of the ankles, and considerable pain started. The patient's appetite was fair; she had considerable constipation and for the first week had nausea and vomiting with bloody stools. Four years ago during the winter the patient had hemoptysis while suffering from a severe cold. At present no such manifestations were recorded. There were moderate shortness of breath after exertion, slight edema of the ankles in the evening, occasionally some fluttering and precordial pains, and flushes of heat at irregular intervals. Examination of the genitourinary system was negative. The patient suffered from insomnia. The knee, left ankle, right shoulder, arm, and fingers were involved.

Physical examination showed a well developed and well nourished woman. Teeth were in poor state of preservation; tonsils of irregular surface, retracted and congested; pharynx hyperemic; cervical glands enlarged and tender; posterior cervical muscles tender, spontaneously and during motion; chest well developed; lungs and heart normal; abdomen negative. The right knee was swollen. There was considerable pain, spontaneously and on motion, and rise of local temperature; motion was considerably impaired. The right hip was tender on motion. The left ankle was moderately swollen and there was much pain, spontaneous and on palpation. The right arm to shoulder was very tender on touch and on motion and moderately swollen with local rise of temperature. The right elbow was equally involved as well as the little joints of the right hand, namely, considerable swelling, pain on touch and on motion, rise of temperature, and impaired motility. The temperature during the first five days was irregular, slightly elevated, fluctuating from 99° to 101.4° F. Pulse, accelerated, ranged from 85 to 100. Urine on examination, April 10th, showed albumin. There was no more on later examinations; specific gravity from 1.012 to 1.020; no sugar; in sediment a few white blood cells and epithelial cells. On April 9th the medication consisted of twenty grains of triple bromides once or twice a day and hot compresses saturated with radioactive magnesium sulphate solution were applied to the painful knee, repeated every six hours. The bowel movements were effected by two drams of compound licorice powder in the evening.

As already stated in a former publication (4) the therapeutic result with these external applications was very satisfactory, but as the other joints were not treated at all, an attempt was made with the application of a special electric apparatus consisting of two electrodes connected with the two poles of the x ray apparatus. The patient was placed in the field of electric waves circulating between the two electrodes, one of them being directly applied upon the involved joint. The treatment varied according to the case but in the average lasted from two to five minutes with a current of eight to ten milliamperes in the primary circuit. The following findings before and after treatment are of interest:

At first the patient, on account of her pains, was unable to sleep, but under the applications to the knee the pains were considerably relieved and the patient spent restful days and nights. The diet was soft throughout; no salicylates were given. Within a few days the patient presented a material reduction in the swelling of the affected joints, the motility was greatly improved, and the compresses were only applied during the night. The therapeutic effect of the local applications to the different joints was very satisfactory without requiring the internal medication of salicylates. April 20th. The left elbow, radioulnar joint, was very tender on pressure with marked swelling; patient

was unable to move her elbow; complete extension was impossible beyond 150°. Both wrists were very tender and swollen, also the second, third, fourth, and fifth metacarpal phalangeal joints of either hand, with impaired and painful motion. Local rise of temperature but no distinct redness. The left knee, slightly swollen and very tender, presented a fair amount of liquid and a thickened capsule; impairment of all movements was much more pronounced on the left side than on the right. The electric radiation was applied for four minutes with ten to eleven milliamperes. On the following day the swelling of both knees was considerably less; hardly any fluctuation wave was obtained in left knee. The capsule was less tender and motility of the joint was better. The same change was noted in the left elbow, namely, diminution of swelling and tenderness and gain in motility. Less swelling of the smaller joints of the hands, absence of tenderness, and less stiffness were found. Further treatments on May 1st, 4th, and 11th of the same duration were followed by considerable improvement, so that the patient, in leaving the hospital after a stay of about four weeks, could move her limbs freely without pain. The swelling of the left elbow had disappeared, as well as the tenderness and thickening of the capsule. The extension of the elbows was still slightly impaired but possible to an angle of 165° to 170°. The small joints of the hands were no longer swollen and tender; their functions were not impaired. They showed normal appearance. The left knee presented a circumference of twelve and one half inches and appeared normal on inspection; no swelling was found; the capsule was slightly thickened; there was no tenderness or fluctuation, and motility was normal. The right knee was of normal size, twelve and three quarters inches in circumference; the capsule was slightly thickened but not tender on touch, and motility was normal.

CASE II.—S. B., aged twenty-seven years; married; occupation, housework. Family history was negative; mother was living and well; of five sisters living, one suffered from nervous spells. The patient had had two children, but both died, one at the age of three years from spasms, the other at birth. Patient had measles, chickenpox, whooping cough, quinsy, and acute articular rheumatism in 1912, with a fever, and involvement of both knees, wrists, and elbows. These joints were very painful; the entire condition lasted from three to four weeks. In 1913 patient had a severe attack of quinsy. She menstruated at the age of twelve years; periods regular every four weeks and lasted from seven to ten days with profuse flow. Venereal history negative as regards ulcers; there had been marked fluor albus for the past two years. Present illness: About December 10, 1914, after having been out in the cold all day, patient experienced in the evening a general chilly sensation with headache. On the following day fever with sweats set in with considerable pain and tenderness in both knee joints. Very soon afterward both ankles became involved in a like manner but to a lesser extent. Simultaneously tenderness over the phalangeal joints of the right hand was observed.

Physical examination showed a young woman suffering from severe pains in both ankles and knees, in a poor state of nutrition and general anemia. Examination of the head, eyes, ears, and nose revealed nothing important. All the upper teeth, save the last molars on both sides, have been removed, leaving large cavities. The lower teeth, four incisors and canines and two last molars were poorly preserved, with numerous cavities. Gums were retracted, roots of the incisors were exposed, and a slight degree of pyorrhea present. Fauces were slightly hyperemic; tonsils and pharynx were moderately congested. There was nothing abnormal in the examination of the neck. Thorax was phthisical in shape; supraclavicular and infraclavicular fossae were depressed; there was free expansion on both sides. Respiration was thoracic in type; both apices were impaired on percussion, particularly over the right side. Except for slight roughening of the expiratory sound over the supraclavicular fossae, auscultation was negative. The apex beat was in the fifth intercostal space three and one half inches to the left of the midline; absolute cardiac dullness showed nothing abnormal. Heart sounds were clear and distinct without any murmurs; there were no thrills or shocks and rate and rhythm were regular. The muscular contractions were of good quality, although accelerated. Examination of the back showed absence of

tenderness, rigidity and deviation of the spine. The abdominal wall was thin and relaxed, but otherwise normal. The gynecological examination revealed nothing particular except a large, hard, firm, indurated cervix with a large laceration and excoriation. Lower extremities were fairly well developed; anterior border of the tibia was not roughened. The right knee was large, swollen, and extremely tender to touch; the skin was reddened, the joint felt hot, and the patella was floating and fluctuating. Extreme tenderness and pain were produced by slight movement. The left knee was painful on motion and presented marked tenderness about the tendinous insertions of the popliteal space; there was no redness. Both ankles were tender and most painful on movement and on pressure; there was no redness and swelling. Reflexes were not obtained on account of the joint condition. In the upper extremities were not involved and axillary and epitrochlear glands were not enlarged; triceps and periosteal reflexes were normal. Pulses were equal and of fair volume; the rate was slightly accelerated; there were normal tension and good rhythm. No thickening of vessel wall was noted. Laboratory findings: Urine, dark amber; specific gravity, 1032; negative to albumin and sugar; sediment showed a few mucus shreds, pus cells, many uric acid crystals, no casts. Examination five weeks later showed similar findings. Examination of blood on December 29, 1914, showed: hemoglobin, sixty-five to seventy per cent; leucocytes, 20,000; polymorphonuclears, sixty-six per cent; small lymphocytes, twenty-two per cent; large lymphocytes, 12.7 per cent. Red blood cells had a washed out appearance. On February 10, 1915: hemoglobin, sixty-five to seventy per cent; leucocytes, 118,000; red blood cells, 3,670,000. Differential count: polymorphonuclears, sixty-one per cent; small mononuclears, thirty-four; large mononuclears, two; eosinophiles, two; basophiles, one. On February 3d the Wassermann test was negative and the gonococci fixation test was positive.

This patient was given different treatments in succession, namely, high doses of salicylates which were not attended by any favorable result; then radioactive magnesium sulphate solutions were applied locally with favorable results, including radioactive water—radiorem, local applianee of the radiorem stick, and finally the electric wave treatment. Only the latter results will be considered in this paper. On February 23d circumference of left knee was thirteen and seven eighths inches. There was a rise of local temperature and very moderate tenderness on the internal condyles. There was not much tenderness elicited on deep pressure upon the capsule itself. The patient was given the electric wave radiation for two minutes. After that the swelling of the knee was less marked; the circumference was thirteen and three quarter inches; no tenderness at all was found by deep pressure upon the capsule itself. There was some atrophy of the muscles of the left leg. On April 12th the electric wave energy was applied for five minutes and well borne. The patient felt considerable relief objectively; the swelling of the left knee joint, the thickening of the capsule had diminished materially, and a considerable motility of the joint was obtained. The final result of the electric treatment in this case was very satisfactory. The improvement was much more quickly observed locally and generally, and it seemed that without any antirheumatic internal medication the patient, relieved from pain, could be induced to use her joints more rapidly compared with the customary methods resorted to in these chronic cases. The patient's temperature for the first five weeks was slightly above normal, gradually coming down from 102.8° F. to 99.6° F., after which time it was practically normal with the exception of the different relapses, during which the knee joint presented more inflammatory symptoms. After March 3d the temperature stayed normal.

CASE III.—Mr. L. H., sixty-one years old, watchman, suffering from articular rheumatism of the left and right knee, at first had been treated by the application of radioactive magnesium sulphate solution. Since he presented at a later period a rheumatic involvement of his wrists, a trial was made with the electric wave application for four minutes, maximum current eleven milliamperes to the right and left wrist. Following this application the patient felt much relieved. Before that he had been unable to move and use his hands. On the following day no pain at all could be produced over either of the wrists. This im-

provement was more noticeable over the right wrist, while the left was still slightly aching. After the first application of the electric wave energy the temperature returned to normal and remained so until the discharge from the hospital. In all, the patient was given six such treatments on June 16th, 18th, 20th, 22d, 23d, and 25th with the same beneficial results. On July 5th considerable improvement of the elbows, wrists, knees, and ankles was noticed without any swelling, tenderness, or fluid; the motility was found considerably improved in all the joints previously involved and no spontaneous pain nor on motion could be produced. The patient's rapid improvement was striking, as notwithstanding the serious and extensive involvement of his joints, he was out of bed after two weeks without the aid of salicylates, and left the hospital much improved in a much shorter time than usually expected.

CASE IV.—Mr. J. P., age twenty-nine years, suffered from acute infectious arthritis involving the right knee, left ankle, and the back. While the back was treated successfully by applying radioactive magnesium sulphate solution, the right knee was subjected to four minutes of electric wave treatment with five to ten milliamperes in the primary circuit. Immediately before the treatment was given, September 21st, the following local findings are of interest: Circumference of the right knee, fourteen and three quarter inches; left knee, fourteen and one half inches. The upper cul de sac, right knee, was infiltrated and tender; the capsule over the internal and external condyle was granular, thickened, and very tender; the popliteal space was tender and infiltrated. The left knee was quite normal. The comparison of the function of both joints was found as follows:

	Right, on day	Left
	Right, following treatment	Left
Active flexion	140°	160°
Passive flexion	148°	160°
Active extension	170°	180°
Passive extension	175°	180°

Marked cracking sounds noticed during flexion and extension: normal. The patient, who for the past three days had remained in bed without being able to make the slightest movement of his joints on account of the pains, felt considerably relieved on the day after the first treatment. Spontaneous pain was absent and better active flexion and extension could be secured. On September 23d another electric wave treatment of the same intensity and duration was given. All pain had disappeared and no tenderness on deep pressure upon the capsule could be elicited. The patient, who was brought in the rolling chair to the x ray room, walked back to the ward, and being out of bed and walking for two hours in the morning and evening, did not experience any discomfort. The next day, seven days after he entered the hospital, he left the institution considerably improved for the resumption of his work.

CASE V.—J. O. C., age twenty years; cartoonist; Union Bridge, Md.; admitted April 20, 1915; discharged May 29, 1915. His complaint was pain in ankles and feet for the past few months. He was well and in good health until August, 1914, when he had an attack of gonorrhea, which was treated for two months with partial benefit. Soon afterward painful heels and arthritis of the elbow and of the phalangeal joints were noticed. For a short time he was treated at the dispensary by vaccine, which gave no relief, so that he had to enter the hospital. He was considerably improved by radium treatment with the exception of his heels, which condition developing later, grew worse after walking and exercise. A recurrence of rheumatism of the ankles and instep followed, for which condition he reentered the hospital. Other symptoms were negative. Urinary examination was negative as to sugar and albumin. The urinary sediment contained a great amount of calcium oxalate crystals, numerous shreds, a few epithelial cells and white blood cells, no casts. Blood: hemoglobin, seventy-five per cent; leucocytes, 15,200; polymorphonuclears, 65; small mononuclears, 28; large mononuclears, 5; eosinophiles, 2. For ten days the patient received five grains urotropin three times a day, and as a tonic, iron, strychnine, and quinine, medication which had no result whatever upon his articular complaints. On April 30th the following local status of his left foot was obtained:

The joints between the navicular and calcaneus were

tender on pressure; also that between first metatarsus and navicular bone. Heel was tender over an area of about one and one half inches square and very sensitive on deep pressure; the external malleolus was not tender nor swollen. Region between the internal malleolus and calcaneus was swollen, infiltrated, and tender on pressure; capsule was thickened. Right foot: There was less swelling of the internal malleolus; it was tender on pressure along the joint between astragalus and calcaneus and navicular bone; capsule was thickened; heel was tender over an area two inches square and along the plantar surface.

Electric wave treatment was applied over knee and foot for five minutes, ten to eleven milliamperes. On May 1st the pain disappeared immediately after the application, and there was considerable relief for the following three hours. On alternate days the same amount of treatment was given. As a result there was hardly any tenderness on pressure over the involved bones and joints. The heel was considerably less sensitive on pressure. The patient felt well, walked better, and had no stiffness, and the left ankle, previously stiffened, could easily be moved. While this treatment of the left side was given no application whatsoever was made upon the right heel and right ankle. After that the same treatment for same length of time was applied, which was also followed by immediate and lasting relief and improvement. On very deep pressure only slight tenderness of the heel was produced, and active and passive movements were no more painful nor impaired. The patient, after being treated four times, was on the whole considerably improved. For his talipes planus his feet were strapped, which gave him considerable relief. General result: Considerable improvement by the electric wave treatment without any internal anti-rheumatic medication.

CASE VI.—C. G., colored, sixty years of age; former steevedore; suffered with arthritis deformans of the small joints of both hands and wrists, thickening of the metacarpal joints, enlarged joints of the fingers, cracking sound on motion, and thickened, very tender capsule. The left elbow was thickened, capsule was very tender, and motility was reduced. The right knee presented considerable swelling; circumference over patella was fifteen and three quarters inches; there were marked tenderness and impaired motility. In previous similar attacks high doses of salicylates had no therapeutic effect whatsoever, while radioactivated magnesium sulphate applications brought transitory relief and regress of the morbid manifestations.

On April 7, 1915, the electric wave treatment was given for two minutes and with ten to eleven milliamperes in the primary circuit to the right knee, and with the same dose repeated on April 8th, 10th, and 12th. During and following the treatment, the patient obtained considerable relief of his pain followed by a regress of the swelling and pain on pressure. The circumference of the knee was fifteen and one quarter inches five days later. On April 14th the hands were subjected to the same kind and length of treatment. The patient had only two treatments for the hands, as he left the hospital shortly afterward. When discharged the following improvement could be noticed: Diminution of the swelling around the metacarpal joint of both hands; less tenderness on touch; absence of the formerly existing cracking sounds. The lateral deviation of the fingers were unchanged. The right knee was considerably less swollen and not tender, and there was a slight gain in active and passive motion. Although in this case, considering the chronic changes, no hope for the restitutio ad integrum could be anticipated, the quick relief from pain and swelling without any internal medication seemed noteworthy.

CASE VII.—Mr. G. P. S., thirty-seven years old, complained of rheumatism for the past twenty-three years, affecting chiefly the knees, ankles, and wrists, with moderate swelling, soreness while standing, and stiffness. The last exacerbation on July 3, 1915, affecting the right knee, was attended by moderate redness, swelling, grinding, throbbing pain, and cracking sensation, particularly during the night. Occasionally similar symptoms were noticed in the ankles, shoulder joints, and elbows. There was no gout or pyorrhea in the family. The patient had an attack of pharyngitis in 1908. There were no respiratory or circulatory symptoms. Digestive symptoms: Occasional nausea, no vomiting, bowels irregular. Weight re-

mained stationary for the past few years. Patient perspired easily. The right knee was swollen; circumference fifteen and three eighths inches, compared with left knee, which measured fourteen and one quarter inches. There was considerable tenderness in the right knee, thickening of capsule, impaired motility, with cracking sensation during motion, and marked soreness on pressure upon the inner meniscus. Left knee was normal. Similar findings were encountered over the left wrist, which presented impaired motility. The elbows on both sides revealed on palpation thickened, granular, tender capsule around the capitulum radii, and on either side of the triceps tendon no pain was found by pressure upon the axle, but impaired motility of these joints. An x ray plate of both knees gave no evidence of any disease in the bones themselves, nor was any indication found of exostosis or joint deposit of any sort. The urinary examination showed low specific gravity, a faint trace of albumin, marked indicanuria, moderate amount of urobilin, and no morphotic elements in the sediment. The analysis of the gastric content, made three and one half hours after a Leube-Riegel meal, showed free HCl, 47.5 per cent.; total acid, seventy-six per cent.

The patient was advised to apply compresses of activated magnesium sulphate solution at night to the affected joints without giving him any internal anti-rheumatic medication. The result was disappearance of spontaneous pain, reduction in the swelling, and allowing better and more extensive movements. As long as the magnesium sulphate application was used the relief was marked but not lasting, so on July 10th, 12th, and 14th the electric wave energy was applied for two to four minutes to the knee, wrist, and elbows with a current intensity of eight to ten milliamperes in the primary circuit. The relief from pain, swelling, and tenderness on pressure was much more marked and the ultimate improvement lasted longer, so that the patient, feeling well during the following two months, required no further treatment. About that time he complained of a slight recurrence of pain and stiffness in his right knee where objectively the capsule over the inner condyle was thickened, granular, and tender, and no fluctuation nor reduction in the extent of extension could be noticed. Over the joint surrounded by a compress of magnesium sulphate solution the electrode was applied for two minutes, ten milliamperes going through the primary circuit. The result of that therapeutic combination was very satisfactory, and the patient, seen a few days later, reported entire relief. Fifteen months later the patient had not reported any recurrence, and when last seen a few months ago, he said he had been feeling very well.

In this, as well as in other instances, my clinical experience suggests that in obstinate cases of chronic arthritis, the application of magnesium sulphate solution will give temporary relief of the morbid manifestations, but for securing lasting results a higher and more potent application of electric wave treatment is required. Not strictly pertaining to the casuistic contribution of arthritides but interesting by the clinical manifestations is the following case of acute rheumatic myositis.

CASE VIII.—Mr. W. G. O., aged fifty years; musician; subject to rheumatic attacks for the past few years. He complained two weeks ago of a severe, dull pain in his left upper arm which made any elevation of that limb impossible, and a sensation of stiffness in the shoulder and elbow of the same side. Different topical and internal applications including the use of salicylates tried by the patient himself secured no relief to speak of, so patient came to my office about July 6, 1915. The general physical findings in the patient were of no special interest. In the middle anterior surface of the left upper arm along and outside of the inner border of the left biceps muscle an irregularly outlined and diffusely very tender mass was found. No inflammatory signs of the superficial layers were met with and no abnormal signs of nerve irritation were present. The patient, whose symptoms suggested an acute myositis probably of rheumatic origin, was first given external spirosal application and thirty-five grains of salicylic acid *pro die*. Slight subjective relief followed

this treatment, but local examination did not show much improvement. So on July 8th, 12th, and 14th the patient was given the electric wave treatment at the hospital from two to four minutes each time, the current being gradually increased from eight to eleven milliamperes with attending spark effect for a short while. The result was very gratifying; the distressing tenderness disappeared completely, allowing extensive and painless motion of the formerly stiff and immobilized arm. The patient's statement of feeling better than ever before was noteworthy, while physical examination revealed the gradual and complete disappearance of the area of diffuse infiltration. The patient, interviewed several months later, testified his satisfaction to his complete cure, which was not attended by any relapse.

In presenting this series of cases, are we permitted to draw any conclusions from the histories? Although we cannot yet pass a final judgment on the method applied, it seems striking that most of these cases improved so rapidly, and that in instances where the usual therapy of salicylates did not secure the desired effect. The rapid disappearance of pain and swelling, obstinate symptoms which lead so easily to permanent deformities and even ankylosis, must certainly appeal to the patient as well as to the physician, particularly where time and pain saving methods are anxiously looked for. In former publications (1, 4) I have already stated how the therapeutic results in acute and chronic arthritis can and should be enhanced. It is by no means the purpose of the present communication to minimize the therapeutic efforts of other colleagues who also recognize the necessity to search for the proper means of securing relief and cure of such chronic and obstinate joint conditions. In another paper, I reported a series of cases benefited by the local application of radioactive magnesium sulphate solution to the joints. Is there any advantage in the use of either of them? Where expediency of treatment is required, particularly if an x ray apparatus is within reasonable reach, the present experience suggests the application of the electric wave energy by means of special electrodes adapted to the purpose. If this is not possible the radioactive magnesium sulphate solution secures rapid but not always permanent relief.

It seems that higher doses of electric wave energy are required to check or inhibit more permanently the morbid process in the joints affected. In some instances a combination treatment of the electric wave energy applied directly over the radioactive magnesium sulphate compress will partially and theoretically increase and prolong the initial effect. Such a possibility is suggested by fantascopic measurements made on compresses thus treated. Since an x ray apparatus is not available to every practitioner comparative studies are in progress as to how a less powerful electric current may be used to secure good therapeutic results. A later communication deals with that problem (5).

From a theoretical and scientific standpoint we may ask for an explanation of the therapeutic effect. Can it be psychic, or is it real, and does the electric wave indeed modify the normal and pathological process in the affected cells by bactericidal or chemical action? A satisfactory answer cannot yet be given and only further physiological studies will lead to a clearer understanding. In biology we have been taught to pay closer attention to the mi-

nute electric changes which accompany or precede the normal functions of cells and organs. In my personal method in applying the electrodes by a gradual increase of the current the patient perceives over the skin an increase of local heat, which slowly changes into a local hyperemia, particularly if a spark effect is produced. Can the effect so initiated be compared to the action of a local counterirritant, or does the application involve deeper structures? Does it change the electric equilibrium of the surrounding cells or ions? Only further experimentation can decide. The epochal discoveries of Tesla, Hertz, D'Arsonval, Doumer, Apostoli, etc. (6), of high frequency waves suggest their practical application to therapeutics in well selected cases. Combined with pharmaceutical remedies we must aim to increase therapeutic efficiency.

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HENRY VIII, A MOST LIBERAL PATRON OF MEDICINE.

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It was not in vain that Froude, the historian, labored to present Henry VIII as one of the most broad minded, sagacious, and just, though arbitrary, rulers of England, when we consider the efforts of this monarch in behalf of scientific medicine. Despite the fact that his vanity was great, his desires brutal and vicious, his tastes sensual, his religion selfish and fickle, he was withal a great monarch, and history cannot but help accord him a place among the world reformers. Henry VIII was a most progressive patron of medical science and was really the father of the movement which led to the formation of army and navy medical departments as we know these organizations today.

On ascending the English throne in 1509 Henry VIII found the practice of medicine in a chaotic state. There were physicians and apothecaries, master surgeons and barbers, quacks, male and female, all practising medicine in a loose and haphazard fashion. The physicians of the day included a host of empirics and charlatans as well as traveled scholars and men of refined science. The first reform in medicine attempted by Henry was a complete reorganization of the medical service of the English naval forces. Before his reign England possessed nothing worthy of the name of navy. When this great monarch grasped the idea that the power of his kingdom would be best shown in the character of his navy, he laid his plans according to precedent with regard to manning the ships built in his dockyards by Italian shipwrights. Until Henry ascended the throne that which best deserved the title of a fighting navy was the flotilla of the Cinque ports, which rose to importance under the

later Saxon kings and Plantagenets. The reign of Edward III, marked by constant warring for the throne of France, brought about a demand for fuller naval organization, which included every seaport of the kingdom. Then the merchant marine of England was impressed for the king's service to transport soldiers, arms, and stores to France and many great sea fights are noted, as that of Sluys, which opened France to the invaders in 1340; Winchelsea, which freed the English coast towns from hostile raids in 1340; and Rochelle, shortly before the retirement of the English army from France in 1372. To be strictly accurate, however, these engagements were fought by land forces embarked in ships which were simply laid alongside the enemy by the mariners. In the Wars of the Roses there was but small need for a navy, but Edward IV prepared for an incursion of France by the same means as Edward III. Edward IV, however, possessed ships of his own, which in peaceful intervals he hired out to traders in much the same manner as did the state of Venice, whose great carricks were frequent visitors of the English and Flemish ports. It is worthy of observation that these Italian craft carried surgeons and a physician as early as 1320. As a surgeon was an absolute necessity during peace times, the same condition obtained during the time of war. That master surgeons accompanied the admiral of the Italian fleet at a very early date may be gleaned from the following: In the library of the Doria Palace at Genoa is a manuscript bearing the date of 1337, wherein is contained an agreement or indenture between Philip de Valois and Anton d' Ovia to furnish forty Genoese galleys, each manned by 210 seamen, among whom there was to be a *barbiero* and a *barbieroto*, or a surgeon and his mate; in addition to which it was specially agreed that the admiral should have with him a *maestro di chirurgia* of his own country, whose stipend from the king of France was to be "ten gold florins a month," while the noble admiral was paid 100 florins a month. The difference in pay between a sailor and master surgeon is today quite interesting.

In the decay of the feudal system, the English sovereigns formed armies for foreign service by legal agreements which were styled "indentures," in which it was specified that armed forces should be raised and equipped, for which they received the king's pay. The first fleet of Henry VIII was made ready for sea on this principle. The ships belonged to the king who entered into an agreement by indenture with a famous sailor captain, Sir C. Howard, to man them. This indenture is interesting because it specifies only two classes of seamen, masters or captains and common men, and defines their respective rates of pay. Surgeons in the fleet were rated and paid as common seamen. This rate of pay continued until Charles I ascended the throne. In 1704 the English naval surgeon was given the same rank as pilot, boatswain, gunner, and carpenter. The low scale of wages prevailing in the Royal Navy, which offered little inducement to the medical men of that period to serve as fleet surgeons, was supplemented by a monthly donation of twopence a man, in consideration of which the surgeon was to provide his own surgical instru-

ments, drugs, and medicines. This was a most undignified and degrading way of compensating medical men, but what else could be expected when the naval surgeon held the same rank as the boatswain? In those days the ships carried priests as well as surgeons, and the former received monthly twopence more a man for spiritual endeavor than did the naval surgeon. This was not the only instance where science was subordinated to a corrupt clericalism.

To the really scientific men of the medical profession Henry granted collegiate rights with power to issue licenses to practise medicine and surgery, and to inspect all shops where drugs were stored and sold, which brought the apothecaries legally under their collegiate control and gave them the power, if so moved, to combine the science and art of surgery with the practice of medicine. The surgeons were master surgeons, whose social and professional position rested on their ability, and barbers, who united the practice of minor surgery with a meaner calling, and they alone possessed corporate rights. Henry VIII amalgamated these into one corporate body styled barber surgeons. Apothecaries were members of the City Company of Spicers, now the Grocers, who then imported the drugs of the Levant. Henry placed them under the control of the physicians. These reforms were begun in 1512 by placing the practice of physics and surgery under ecclesiastical surveillance. At that time it was ordained that all medical practitioners, except those having degrees from Oxford and Cambridge, should be examined by the clergy, assisted by medical graduates or surgical experts in each branch respectively. In the fifth year of Henry's reign, 1513, it was enacted that all barber surgeons should be exempted, as in time out of mind, from bearing arms, and should also be accorded the same privileges as heralds. This exemption, however, was not accorded to the physicians.

In the tenth year of his reign, 1518, he gave to the Royal College of Physicians its first charter. Cardinal Wolsey had much to do with this act of incorporation. This charter meant selfgovernment for the medical profession. Five years later this charter was affirmed by an act of Parliament. Truly, this must be considered as the act of emancipation of medicine from that Church which had leagued it with astrology and the occult sciences and had degraded surgery to the lowest point.

The need for cultivation of anatomical knowledge was recognized in 1538 by an act of Parliament legalizing dissection at the Hall of the Barbers. Within the next two years the barbers were incorporated under the name of Barber Surgeons Company of London, and authorized to pursue the study of anatomy through dissection, in face of the most violent opposition by the Church. To stimulate and encourage the students of anatomy it was enacted that the company "may take annually the corpses of four condemned fellows put to death, to make incision for the further and better knowledge of surgery." It also meant the separation of true surgery from the art of the barber, by enacting that no barber should practise surgery, except the letting of blood and drawing of teeth, and that no surgeon should exercise shaving or other work pecu-

liar to barbers. On the petition of Sir John Gresham, lord mayor, Henry gave in 1547 the building of the dissolved Priory of Canons to the City of London in order that it might be converted into a hospital for lunatics. The great madhouse was known as Bedlam, and was situated in Moorfields, on the south side of what is now Finsbury Square. That Henry VIII should have been so active in medical reforms while engaged in a bitter controversy with the Church of Rome shows him to have been a leader of no ordinary qualities. It was through his efforts that medicine was divorced from the Church. The renaissance of scientific and rational medicine had its origin in the reign of Henry VIII, and it cannot be doubted that this monarch's break with the Church marks an epoch in medical progress.

820 BARONNE STREET.

OTOSCLEROSIS. *

By M. W. FREDRICK, M. D.,
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Were I to follow the precedent of the majority of authors who have written on the subject of otosclerosis I would begin my article by deploring the fact that since the recognition of the condition, or conditions, called otosclerosis nothing has been achieved in the way of therapeutics, and that at the present time there is no promise of any means of combating this most deplorable malady. On the contrary, otosclerosis is the *noli me tangere* of ear diseases. No practising aurist can read the address of Philip D. Kerrison, delivered at Atlantic City in June, 1914, on the Treatment of Advanced Tympanic Deafness, without acknowledging the truth of his statements, and without feeling sorry both for himself and for the sufferers from these conditions. He must feel abashed when he considers that after fifty years we have achieved no other result than to demonstrate that with our present therapeutic resources the less we do to patients afflicted with otosclerosis, especially in the way of local treatment, the better both for the patients and ourselves; and that in face of the fact that otosclerosis is responsible for about eight per cent. of all ear cases. This, however, does not permit us to fold our hands and resign ourselves to innocuous desuetude simply because our otologic forbears have not succeeded in devising ways and means for alleviating, if not for curing, this condition.

Most aurists, that is, those who can diagnose the condition, do not welcome the otosclerotic, as they have the alternative of truthfully telling the patient that nothing can be done for him, and that the sooner he resigns himself to his fate the better for his mind and pocketbook, or of doing what some equally unscrupulous practitioner will do, treating the patient until he is tired of his lack of improvement or frightened by the progressive impairment of his hearing, and ceases treatment, denouncing the aurist as a liar and a grafter. Otosclerotics, however, belong to the most persistent seekers after relief, and the word of an honest practitioner car-

ries little weight with them, as long as any one can be found who is either ignorant or dishonest enough to promise them relief, let alone cure. Hence the prosperity of the gentlemen who work in the field of "deafness positively cured, head noises absolutely banished; one week's treatment free." These gentlemen are aptly termed by a French author "*les industriels de la surdit  vaincue*." These facts impose upon the aurists the duty of trying ceaselessly to enlarge and clarify our knowledge of the pathology and therapeutics of this, or these, conditions.

I have absolutely nothing new to bring you, in which regard I am following the precedent of the vast majority of those who have spoiled many a fair sheet of paper in this cause. I have noticed the lamentable paucity of space devoted to this subject in our American special journals, and I hope that the frequent presentation of the subject of otosclerosis will awaken the interest of the younger men who are now blinded by the more brilliant and attractive surgical procedures in otology and leave the obscure and obstinate subject of otosclerosis to its fate. It is the work of a young man, inasmuch as it will be the work of a lifetime to do any real work in otosclerosis, a disease which, as a rule, progresses slowly and demands careful functional examination, history taking, investigation of ancestral faults, following up, etc. The proper examination of a case of otosclerosis demands more time and patience than most practitioners are able or willing to spend. In many cases we shall feel like saying, as did the physician, who was called to treat an infant: "You have called me too late." "Why," said the parents, "we called you as soon as we noticed that the boy was sick." "True enough," replied the physician, "but I should have been called to treat the grandfather." This answer gains in significance when we learn that Ferreri finds that many cases of deafmutism are due to an attack of capsulitis labyrinthi in fetal life.

I once asked an aural colleague what he did for the people who applied to him for relief from noises in the head, and he told me that he sent them to his enemies. This crystallizes our attitude towards the otosclerotics, and still it should not be such if we live up to our Hippocratic oath, as every humane practitioner should. Not all of us can be originators; most of us must be content to be imitators, and some of us educators. Were I to succeed in stimulating even one among my readers to take up this subject and to pursue it to some beneficent end I should feel more than repaid, and should feel that your and my time has been excellently spent. There are some among us who can boast of hundreds of successful mastoid operations, and count the number of cases of favorably treated sinus thrombosis by the score, but not one of us has ever cured, or even relieved, a single case of otosclerosis.

Now, as to the name of this condition, Toynbee, in 1862, proposed the name of "rigidity of the ear," and von Troeltsch, a couple of years later, having confirmed the findings of Toynbee, and, as Lermoyez says, having missed the opportunity of being father to the child determined to be the godfather, presented the child with the same name in a Greek dress, hence the designation "sclerosis." But Toyn-

*Read before the California State Medical Society, April, 1917.

bee and von Troeltsch did not have in mind the pathological picture that we have today, but referred to a process beginning in the mucous covering of the drum, ossicles, and vestibular windows, which had as its end result the calcification and ossification of the ligament annulare with complete fixation of the stapes. In 1893 Politzer revised the pathology and created a new name "otosclerosis," under which name the condition has thrived and grown until the present day in spite of numerous attempts to change it to conform to some individual view of the pathology, each observer trying to substitute a descriptive name to accord with his findings. But, until the pathologists agree, it seems to me to be better to adhere to the term "otosclerosis," which, although it may not be pathologically correct, at least presents to us clinically a well known picture. While we may be talking about conditions which are pathologically different, we still have in mind the same clinical picture, the same syndrome, and are thus in unison at least in one respect. Whether we speak of stapedioankylosis with or without spongification of the labyrinthine capsule; periotitis ossificans stapediostibularis; osteospongiosis; otospongiosis; osteitis chronica hyperplastica; osteodystrophia petrosa; or of the many other anatomicopathological descriptive terms which have been proposed, there is not enough certainty about any of them to insure endurance, and I think, with Denker, that we had better stick to our old acquaintance "otosclerosis," until we have very good reason to change.

There are so many different views as to the pathogenesis, each one supported by good and careful observers, that one is forced to the conclusion that there must be several conditions grouped under this heading, and that the true pathology and classification is still the work of the future. This is the most important part of the whole subject, for until we can feel that we have found the true pathology our therapeutics will be at sea. Unfortunately most of the cases that have been examined microscopically occurred in old people, in whom bone and nerve changes are apt to occur as senile changes. This again illustrates the importance of recognizing the disease in its early stages, and of examining histologically the petrous bones of those showing signs of otosclerosis, or of those young people in whose families otosclerosis has occurred, but who have presented no clinical symptoms in themselves. It is only in this way that we shall arrive at a true conception of the real nature of otosclerosis, that is, by getting anatomical data of the early stages. It is work which requires infinite patience, as does all bone tissue work.

There are at least three well defined views of the pathogenesis: Politzer thinks the disease begins in the bony labyrinth, but denies that the bone islands are spongiosa; Siebenmann believes that the disease originates in the bone, and that the bone islands are spongiosa; and Habermann found compact as well as spongy bone, and places the origin of the process in the periost. Each of the views mentioned has a number of adherents among worthy men, and there are a number who hold views of their own, such as Gradenigo, who looks upon the

mucosa of the nasopharynx and of the tympanic cavity as the real point of departure, and others who think the acoustic nerve is the primary seat. As Heiman says, the only sure thing about the question at the present writing is the ankylosis of the foot plate of the stapes.

As to the etiology there is small wonder that most of the constitutional dyscrasias have been accused. A disease coming on so insidiously and making itself manifest only after serious functional changes have taken place, with so few local causative changes and such a decided hereditary feature, must arouse the suspicion of a constitutional cause with a local predilection. Tuberculosis, arthritis, rheumatism, anemia, intestinal toxemia, and a host of others have been mentioned and studied at length, always with the evident desire to lead up to a more rational therapeutics. Syphilis has been accused by many, and stoutly denied by others. I quote from Denker's paper read before the Ninth International Otological Congress, held in Boston in August, 1912: "Of the other etiological factors, lues, above all, has been accused of being the cause of this disease. Habermann made the most thorough study of this phase, and is convinced of the causal relation between otosclerosis and syphilis. Later investigations have shown, however, that lues is not a frequent etiological factor in producing the characteristic changes in the labyrinth capsule, first, because the vast dissemination of syphilis would cause a more frequent occurrence of the aural affection; and second, because men suffer from syphilis much more frequently than women, while otosclerosis is specially a disease of the female sex. But especially do the results of the Wassermann reaction argue against the correctness of Habermann's theory: the examination invariably gives results which speak against a luetic etiology."

To me, however, the causal connection between otosclerosis and syphilis seems very alluring in spite of the absence of other stigmata of hereditary syphilis, the negative findings of the Wassermann test, and the fact that antisiphilic medication is absolutely valueless. The bone changes are identical with the bone changes in syphilis, and against syphilitic bone processes unless they are in the hyperplastic or gummatous stages, antiluetic remedies are also useless, as, for instance, caries sicca and luetic hyperostoses. Alexander holds that the catarrhal otitis media so often seen in children with congenital syphilis is a syphilitic manifestation. There is slight or no improvement after the resorption of the exudate, and the lesion of the middle ear is replaced by a lesion of the inner ear. Thus do these catarrhal conditions develop into conditions which correspond clinically to otosclerosis. Nager notes that middle ear affections in congenital syphilis, as in other severe constitutional derangements, show a marked tendency to break into the labyrinth. Otosclerosis is a disease which becomes apparent, as a rule, in the second and third decennium, and it is a well known fact that the Wassermann test is frequently negative in congenital syphilites who are over twenty years old. The proponents of the congenital syphilis theory hold that otosclerosis is a highly attenuated form of lues, and that the ineffi-

ciency of antiluetic treatment is due to its being used far too late to do any good; that in families in which a tendency to otosclerosis is evident the antiluetic treatment should be used against the whole family even from the earliest age. Many authors, including Politzer, insist on the marked vulnerability of the acoustic nerve from all kinds of noxa, and we must not feel surprised that such a searching virus as syphilis should find this easily wounded member. This explains the nerve affection, but the osteospongiosis needs more elucidating. Quoting from Brooks's textbook of pathology: "In congenital syphilis a pathognomonic change of the chondroosseous junction, an osteochondritis syphilitica, is frequently observed, which appears as a yellow white line at the epiphyseodiaphyseal junction. This line corresponds in its position to the 'zone of provisional calcification.' In healthy children the latter forms a very small, scarcely visible line of demarcation between the epiphysis and the diaphysis. This small line is transformed by hereditary syphilis into a broad, distinctly visible line, which consists of calcified but dead cartilaginous tissue, for the calcification occurring in syphilis is a definite variety, a kind of petrification which corresponds to a necrotic process. The dead cartilage excites proliferation in the neighborhood which under certain circumstances may lead to complete dissection of the cartilage from the bone, so that a kind of fissure is formed between them." This picture is easily recognized in many of the temporal bones of otosclerotics. The prevalence of the bone lesions in the labyrinth capsule is due to highly organized formation of the labyrinth and its ready response to all insults. Cornet reports that fifty per cent. of his cases of otosclerosis had arteriosclerosis. In many cases of otosclerosis we find, on microscopic examination, that there is an atrophy of the stria vascularis and of Corti's organ, just as there is in senile deafness due to arteriosclerosis. O. Mayer has found atheroma in the internal carotid and auditory arteries in otosclerosis. Ferreri thinks an infection with streptococci is to blame, and claims to have effected cures. Rheumatism, gout, and gastrointestinal disturbances are among the offenders mentioned. Siebenmann thinks the accretions the final phase of bone growth as it occurs in all hollow bones but does not occur in the petrous bone under normal conditions. This is an attempt to make the histological findings accord with the frequent grouping of cases of the disease in families.

The diagnosis presents but little difficulty, and one has but to bear in mind Bezold's triad to distinguish this condition from others in which there is marked, or severe, deafness: 1. Normal drum, moving easily, patent Eustachian tube. We have, as Lermoyez says, a normal appearing ear which is deaf. 2. Marked raising of the lower tone limit and slight lowering of the upper tone limit. 3. Severe deafness for air borne sounds; marked increase of bone conduction; prolonged Schwabach; subjective noises. To these three many other symptoms may be added, but these three are the classic ones. The rose color of the promontory is mentioned by a number of authors as a valuable aid in diagnosis.

This is due to an injection of the promontorial mucosa in the region corresponding to the lowest turn of the cochlea; it is crescent shaped, with its concavity directed towards the umbo. In my student days this congestion of the promontory was regarded as an indication of the presence of adenoids. Many otosclerotics have a mild deep seated pain running down the neck; as one of my patients expressed himself, he felt as though he had been dealt a blow with a blunt weapon. A feeling of fullness in the ear is not uncommon. Street noises do not annoy the otosclerotic, as he has lost his appreciation of the low tones. He shows the symptom called paracusis Willisiana in a marked degree. What annoys most otosclerotics even more than the deafness, to which they have become in a measure resigned or accustomed, are the subjective noises, of which every variety and modification is presented. In some cases these noises become so annoying that the patient would welcome death or absolute deafness. A peculiar feature in some cases is the occurrence of these noises even before the onset of noticeable deafness, which leads some observers to think that the primary seat of the disease is in the acoustic, a view which is not justified in my opinion, although it has the support of Babinsky. Heiman mentions the prominence of the anterior fold of the drum and regards this as a distinguishing symptom from involvement of the tympanic mucosa, in which the posterior fold is the more prominent. I have never paid attention to this feature, and fail to understand how it is brought about, unless there is some truth in the statement of Zitowitsch that otosclerosis is due to an insufficiency of the internal ear muscles.

Of late Froeschels has added another symptom which may be of value, which he has named pallessthesia. This is a lack of response to tickling of the external auditory meatus. In 1895 Lemcke showed that three quarters of all deaf mutes showed hypessthesia and hypalgesia of the external auditory meatus, no matter whether the deafmutism was congenital or acquired. The symptom loses somewhat in value when we learn from von Urbantschitsch that chronic suppurations of the middle ear also decrease the sensibility of the external canal. However that may be, the pallessthesia increases as the hearing power decreases. In some well marked cases there is also anesthesia of the lobe, according to W. Kraemer. The lack of cerumen was already noted by Toynbee, and the large size of the external canal is noted by von Urbantschitsch.

Vertigo is not an infrequent symptom, occurring in perhaps one half of the cases, but is never serious or of a lasting character. It is supposedly due to a breaking of the perilymph into the small cavities of the newly formed spongiosa, thus causing vertigo through lowering of the intralabyrinthine pressure. A very valuable aid in detecting stapes ankylosis is Gellé's test, which I had the pleasure of seeing thoroughly tested in Block's clinic in Freiberg in the early nineties. While this test is not decidedly characteristic of otosclerosis it gains in value when we consider that ninety-five per cent. of stapes ankylosis is due to otosclerosis. The condition of the otosclerotic does not follow the changes

in weather, humidity, etc., as do so many of the middle ear conditions. As one author expresses himself, the otosclerotic ear is not a barometer.

Discussion of the therapeutics of otosclerosis is simple, inasmuch as the advice given by the best modern authorities is identical with the advice given by PUNCH to people about to get married, namely: "Don't." According to the latest views every measure used in the treatment of the strictly local conditions or the anomalies of the annexa of the ear, such as the correction of nasal deformities, the removal of adenoids and tonsils, insufflating the middle ear through the Eustachian tube, massaging the drum and ossicles, etc., leads to a lessening of the hearing. As is usual in the case of stubborn and nonresponsive conditions we have been overwhelmed with therapeutic measures and devices, most of which have been lauded to the skies by the medical inventor and the financial promoter. Twenty years ago the office of the aurist was never without a musical instrument such as a banjo or a guitar, or a vibrator, or some more complex instrument which was supposed to exercise the rigid ossicles and supply them their lost mobility. Lucæ's pressure probe has long since been discarded, and no one seems to have taken to the procedure which called forth a priority war in the true German fashion between Doctor Sugar and Doctor Richter; this consisted in gluing a small pledget of cotton to the drum by means of a solution of sandarac, and then pulling on this about fifty times. This, at any rate, was less harmful than the attempt of Kerrison to mobilize the ossicles by cutting through the drum and pulling on the hammer handle with a blunt hook, a procedure which Kerrison himself soon discarded. All these methods overlook the fact that the main and permanent feature of otosclerosis is the fixation of the stapes, and that, however much we exercise the hammer and anvil we shall never succeed in breaking the ring of bone or dense cartilage which holds the foot plate or the branches of the stapes imprisoned in the oval window. A direct attempt to remove the stapes *in toto* was equally vain, inasmuch as the stapes either breaks, leaving the foot plate occluding the oval window as before; or an equally dense new plate of bone reforms, totally nullifying the sometime temporary improvement, if indeed the operator was fortunate enough to escape infecting the labyrinth with its dire results. Equally illusory were the attempts to practise a new opening in the promontorial wall. Only one writer claims to have had any success with the vibratory treatment, and that is Preobraschensky, of Moskau, who has reported on forty-two cases of otosclerosis which he treated, in thirty-two of which there was marked improvement. He states that the usual vibratory apparatus is too vigorous, and he therefore devised a rubber lipped metal cup which covers the auricle and mastoid region, and in which the strength of the vibrations can be regulated by a valve in the side. While I have not had an opportunity to verify his results I am much inclined to place them with others of a like nature. The osteopaths claim to alleviate the symptoms of otosclerosis by massage of the neck and the mouth of the Eustachian tube, and the

latter method has been advocated by some of the oldtime school. Whether the determination of an increased flow of blood to the aural region is really of benefit remains to be seen. The administration of vaccines which improve osteomalacia has been lauded, on the assumption that otosclerosis is a manifestation of local osteomalacia, and the exhibition of hypophysis and pituitrin tablets, ovarin and spermin to pregnant women is recommended by Denker. Bobone, following Bossi's theory that osteomalacia is due to a faulty secretion of the adrenals, suggests the administration of adrenalin, from which he claims good results in one case, but that consisted even there in the decrease of the tinnitus only. The contention that otosclerosis may be a consequence of faulty function of one of the internal secretion glands has an air of probability and is well worth further investigation.

The much vaunted radium has proved itself absolutely valueless in my experience, as it has in the experience of many others. This form of treatment came to our notice first through the exaggerated claims of one *Bade-Arzt* in one of the radium water resorts. This gentleman was not an aurist, and his statements were entirely lacking in precision, although not lacking in enthusiasm. There is no doubt that the noises are temporarily lessened, which is explained by Albrecht by the selective action of the radium which attacks nerve elements furthest below par and puts them out of commission for a time, but when they recover the noises return. The improvement in hearing noted in some cases is, no doubt, due to the lessening of the tinnitus, and with the return of the tinnitus this improvement is nullified. There is, however, one service which radium can render us. In cases where the tinnitus makes the patient think of suicide, and makes him willing to submit to any measure which will bring him relief, the resection of the acousticus, with all its dangers, was submitted to in some cases. This major operation is no longer necessary when the patient is willing to accept complete deafness, as that can easily be brought about by radium without the slightest danger to the general health. Several applications of a strong radium pencil—twenty-three mgm. is the amount mentioned by Marx—for a period up to forty minutes will entirely destroy the terminal acoustic without injuring the surrounding tissue.

For the relief of otosclerosis the use of thiosinamin and fibrolysin whether injected subcutaneously or introduced into the middle ear through the Eustachian catheter, has been of absolutely no value in my hands, although tried in a number of cases. The insufflations of medicated vapors, injection of dog's pepsin through the drum, thyroid medication, sérum antiscléreux Malherbe, and a host of others have so few, if any, victories to signalize, that I think they may be consigned to oblivion. If we hope to lessen the head noise we are justified in using local measures, even though they may impair the hearing, and in this regard I have got better results from hot air than from any other measure. Likewise is one justified in using measures which may prevent intercurrent acute middle ear conditions from becoming chronic.

The most important thing in otosclerosis today is the prophylactic side, and in this way we may be of real benefit to the otosclerotic. Whether we can extend this to treating all the members of the family in which otosclerosis has shown itself from infancy with antiluetics or phosphorus is a mooted question, but those who are under suspicion of having inherited the otosclerosis strain should be under constant care. As children their mothers should be warned against unduly exposing their bodies, as, for instance, by having them go about in bare legs and without hats in all kinds of weather. By hardening their bodies they at the same time are hardening their ears. Chilling of the surface whether through swimming, showerbaths, wetting the head, or any other cause should be avoided, as should all so called colds. Automobile riding is bad; also exposure to wind and weather, as shown by the large number of severe cases of otosclerosis among country people. The idea of heredity is well spread among the laity, and the authors state that it occurs in from nine to eighty-two per cent. It should be borne in mind that the heredity need not be a direct one, but is more often a collateral one, and that a good deal of seeking is sometimes called for to discover the otosclerotic ancestor, due to the well known indifference of most people in these matters. Hitherto we have been misled into thinking that these cases were due to local causes in the nasopharynx, and have been overzealous in removing any and everything which might lead to local inflammations and their sequelæ. According to the best teachings of today we have been committing crimes against these children, but we may well excuse ourselves by stating that we were not aware of the otosclerotic tendency, inasmuch as the symptoms do not declare themselves until after puberty or well into the third decennium. School inspection might help us, if we could tell the instructors how to recognize the early stages of otosclerosis, but this is, so far, an unknown art.

The otosclerotic woman, like the tuberculous woman, should avoid pregnancy; while pregnant she, like the tuberculous woman, seems to improve very much generally, but after parturition her hearing grows decidedly worse. The outlook for the otosclerotic girl is anything but cheerful. To translate the epigram of a French author: for the girl, no marriage; for the wife, no child; for the mother, no nursing. While the mother may be willing to sacrifice her hearing for the joys of motherhood, she should remember the hereditary taint she is conveying to her child.

There is one feature of otosclerosis which should make us strive to find some relief for the sufferers from this trouble, and that is that, whereas the people who are deaf from old adhesive processes of the middle ear or degenerative nerve changes are, as a rule, old people whose life has been lived, and whose position in life has been secured; who have passed through the pleasures and disappointments of early and middle life, and can afford, as the saying is, to take a back seat, the otosclerotics belong to the younger class, who are just starting out to take their places in the world's work and pleasures. Small wonder that so many of them become victims

to the numerous neuroses and insomnia, when it is realized how hard it is for them to make progress in the face of the prejudice against the deaf, how many pleasures they are being deprived of, and how hard it is to conceal their infirmity.

BUTLER BUILDING.

ETHER THERAPY IN SURGICAL INFECTIONS AND ITS EFFECT ON IMMUNITY.

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The study of this subject is surrounded by difficulties and perplexities. We have to deal with a chain of physical, biological, and chemical processes in infection and immunity, simplification of which has not yet been attained in spite of the many researches and investigations that have been conducted and the large number of articles that have appeared in medical journals; in fact, recent works and writings have added more complexity to the subject. A rational study of the subject compels us to direct attention first to the two forces in the struggle of infection, the invading bacteria and the invaded living tissues, and to learn, as far as we can, the actual strength and reserve power which each has or can command for offensive and defensive action, before we can examine in what manner ether can help or hinder either the one or the other in this struggle.

Once they are lodged and begin to grow in the living tissues, the bacteria will multiply and produce by their vital activity a number of poisons among which are toxins, ferments, aggressins, etc., and develop through stimulation by their host the defensive bacteriogenic antibodies. When the body is invaded by bacteria, it brings early into action an inborn resistance, a natural immunity, which kills the bacteria and neutralizes the toxins, and later a developed resistance, an acquired immunity, in which a physicochemical alteration in the tissues of the body is brought about by the presence of antigens and leads to the development of immune bodies. In considering the nature of the changes which are excited in the response of the body to infection, I believe the pendulum has swung too far in the direction of antigen antibody combinations, amboceptors, etc., and that the influence of surface tension, permeability, solubility, osmotic pressure, and other physicochemical processes is almost ignored. Further, there is some justification for one to become sceptic of the views current generally that the principal feature of antigens is their intimate association with protein, that it is impossible to obtain antigens altogether free from protein reactions, and that lipoids could not act as antigens. Warden's work (1) has definitely established the existence of fatty antigens regarding the gonococcus and syphilis.

These general remarks will serve our purpose without going into the conditions necessary for infection such as the dose, virulency, and pathogenicity of the bacteria, and the conditions which increase or decrease the vital resistance and the

vulnerability of the living tissues by the bacteria. The practical questions are: How does ether harm the bacteria and how does ether help the vital resistance. Before I proceed to answer these questions, I wish it to be remembered that ether plays a different part when used in therapeutic doses and in dilution from that when used in anesthetic or full strength doses. Further, the effects of ether produced locally on the surfaces of tissues is different from the effects produced generally on the tissues and body fluids after absorption. This difference is due to the degree of concentration; it is strong in the former and weak in the latter. How does ether harm the bacteria? Experimentally and clinically, ether, whether in its vaporous or liquid state, has been proved to have a bactericidal action. Spore bearing organisms, however, are strongly resistant to it. Vincent's typhoid vaccine, which has been used frequently and with excellent results, is sterilized by ether instead of by heat (2). Within the experience of some laboratory workers, ether has never failed to sterilize albuminous culture mediums (3). The structure of a bacterium is regarded generally as consisting of protoplasm surrounded by a cell wall. Ether, by exerting a solvent power for fat, causes an increase in the permeability of the wall and consequently a modification in the aggregation of the colloid protoplasm particles.

How does ether help the vital resistance? 1. Ether is an agent which increases the outflow of lymph by inducing active hyperemia (4). In this way, it increases the various immune bodies which may be supposed to be present in the exudate: the antitoxins, the antiferments, the bacteriolysins and the bacteriotropins. Further, it stimulates the tissues by giving them more nutrition. 2. Ether is a cell proliferant. It is owing to the weakening of its membrane that the movement of the protoplasm underlying every cell division manifests itself. Ether and other substances which dissolve fat weaken the membrane of the protoplasm. Their effect on the activity of cells is a widespread phenomenon not only in animal cells but plant cells also. Chiari succeeded in forcing blossoms to a considerable extent by ether vapor, and Mansfield forced the germination of pumpkin seed by vapor of ether and alcohol. 3. Ether by its tonic action on the circulatory and nervous systems may possibly have a stimulating influence on the hematopoietic organs. 4. By directly destroying a large proportion of the bacteria and by modifying those that are not killed so as to render them more easily destroyed by the tissues ether might lessen the output of aggressins (5). 5. Graham-Rubin showed that hypodermics of ether rendered rabbits more susceptible to systemic infection with streptococcus and pneumococcus, and Stewart showed that this was especially true of infections to which immunity was phagocytic. Some assert that ether probably retards the formation of antibodies. Francois found the phagocytic activity of the leucocytes was lessened or abolished after ether anesthesia and that this effect lasted for twenty-four hours (6).

Leucocyte emigration apparently goes on unaffected in the presence of ether (7). Ether, ap-

plied in small doses, has a stimulating effect and paralyzes when applied in greater quantities. This Hamburger (8) explains by distinguishing two factors. First, it may be accepted that the outer layer of the cells consists of a fatty substance, a so called lipid surface. Such a surface, after having absorbed ether in slight quantities, will grow softer and more flexible, and consequently the plasticity and mobility of the cells will be facilitated. In this way ether causes an increase of the phagocytic power. Second, when greater quantities of ether have been taken in by the cells the paralyzing effect on the protoplasm comes into play and a decrease or inhibition of phagocytosis occurs. Further, ether has the property of impeding the oxygen consumption of the cell. If a small dose of ether is acting, only part of the available oxygen will be rendered useless; in other terms, the blockade of the oxygen will be incomplete, and this causes an acceleration of the phagocytosis. When the store of oxygen of the cell becomes more exhausted, a decrease of phagocytosis takes place. Ether is a valuable therapeutic agent in the following septic and infective conditions: septic wounds; abscesses and sinuses; peritoneal infections; pleuritic infections; joint cavity infections. In a former publication I (9) have referred to the beneficial effects of ether when used as a prophylactic agent to prevent infection of incisions and to maintain asepsis by washing the entire wound with ether prior to closing it. The clinical fact that ether does not prejudice the healing of an aseptic wound, that is, one from which organisms have been excluded, is strong evidence that it does not hamper the defensive agents of the body and the vital resistance of its tissues.

Septic wounds.—If the conditions in a septic wound were the same as in a culture tube, surgeons would give up controversies and bury differences of opinions as to the claims for the highest efficiency of each of the many antiseptics and leave it to the laboratory worker to decide once for all which is the most efficient antiseptic; but the destruction of bacteria in a culture tube is a much easier and simpler matter than the destruction of bacteria when lodged in the living tissues or mixed in their debris. Almost all antiseptics have no selective, specific, or stronger action on the bacteria than on the living cells and tissues in which the bacteria are embedded. If they destroy the life of the bacteria, they destroy also the life of the cell. They are fixed by protein material, and apart from their action as a germicide we have also to consider their toxicity, solubility, absorption, and penetration when applied as a wash or dressing to wounds.

So far, we have not realized the dream which Huxley suggested and thought would become possible, "to introduce into the economy a molecular mechanism which like a very cunningly contrived torpedo shall find its way to some particular group of living elements, and cause an explosion among them, leaving the rest untouched." We must, therefore, keep in mind the fact that when bacteria are actually in the living tissues nothing but the living tissues can destroy them, and direct our efforts to the finding of an agent which will help and stimulate the living tissues in their work, and give up our

useless claims and comparisons of agents which act as bactericide and cytoclast at the same time.

So far we have no ideal antiseptic; but I believe that ether surpasses all the antiseptics at present known, for the following reasons: 1. By stimulating and promoting the growth of tissues, ether hastens the formation of fibroblasts in the wound and quickens the regeneration of embryonic tissues without clotting the fibrin. 2. It increases the antibacterial agencies of the body through the active hyperemia it produces. 3. When applied to the most delicate surfaces of living tissues, such as the mucous and serous surfaces, it produces no injurious effects. 4. When absorbed, all evidence shows that if ether has any toxic action on the body tissues it is very slight. 5. It apparently does not affect leucocytic emigration. Clinically, I have obtained excellent results from the use of ether in moderate strength and in dilution, in washing, irrigating, and dressing wounds of every description, including gunshot wounds which I have met with in accident cases admitted to the Elizabeth City Hospital from the agricultural and hunting districts. It would be wearisome to give a detailed report of them, but some exhibited very severe septic infection, extensive destruction, and deep penetration into important tissues and organs, and were undoubtedly severe tests to prove the value of ether against sepsis and infection.

Abscesses and sinuses.—An abscess is the result of an infection which leads to the death of a large number of polymorphonuclear cells and the liberation of a proteolytic ferment which dissolves the surrounding albuminous tissues and promotes their absorption. The rational treatment in such a condition is to evacuate the shut up pus with its disintegrated leucocytes and inhibit the action of the proteolytic ferment, and thus lessen the local destruction and relieve the general effects due to the entrance of toxins into the circulation. After evacuating the pus from the abscess cavity by an incision or aspiration, and flushing it with normal salt solution if the pus is thick, Nature, owing to an impeded circulation the result of inflammatory processes, is unable to pour serum into the abscess cavity in sufficient quantity to overpower the action of the infective agents; therefore, I introduce ether into the cavity and sew up the incision generally without drainage. Apart from its bactericidal action, ether coming in contact with the walls of the cavity stimulates the tissues and produces hyperemia and consequently an increased flow of lymph into the abscess cavity. Clinically, I have obtained good results from the use of ether in the treatment of abscesses caused by tuberculous, pyogenic, and mixed infections, and also in the treatment of sinuses due to the same infections where there are present an inner contaminated layer of granulations and an outer layer of thick and dense fibrous tissue acting as a barrier to the flow of an adequate lymph supply to the inner layer.

Peritoneal infections.—I have never used nor do I recommend the use of ether in peritoneal infections which are caused by the passage of the organisms through the walls of the intestines as in a case of general peritonitis with obstruction. I have,

however, used ether and found it valuable in cases where the infecting material is being introduced into the peritoneal cavity from outside, as it is in a localized perforation of a hollow viscus with escape of its contents. After removal of the extravasated material and the prevention of further leakage, the use of ether by lavage or instillation is beneficial. I have published (10) a clinical report of the technic, dose, and results in 248 such cases. I have no personal experience of cases where the infecting material is introduced into the peritoneal cavity from outside, as it is in wounds of the abdomen. Rouhier (11), who was attached to a mobile surgical station close to the firing line in France, in concluding his report of forty-six cases of projectile wounds of the abdomen, says: "Every intervention should end in a careful cleansing of the abdominal cavity in all dependent parts. . . . For this purpose lavage with ether in moderate strength is valuable." The beneficial action of ether is probably due to the same factors which assist generally the vital resistance, and which I have mentioned in my general remarks.

Experimentally (12), the ether injection into the healthy peritoneum produces a clear effusion which is seldom very abundant. In this effusion, during the first two hours, the endothelial cells predominate and the polymorphonuclear are relatively scanty; later, the polymorphonuclear cells rapidly increase at the expense of both the endothelial and small mononuclear cells. No adhesions result from the injection of ether without manipulation. In some experiments on dogs (13), the introduction of ether into the peritoneal cavity under unclean conditions or in the presence of pus produced fatal results. This may possibly be due to the increased rapidity in the absorption of the introduced bacteria, and possibly also the amount of ether that a dog can tolerate may be too small to produce an inhibition or a beneficial modification of such a degree of infection.

Pleuritic infections.—Any one who has had experience with empyema recognizes the fact that the treatment of it is unsatisfactory in spite of the numerous methods and operative procedures, such as drainage, irrigation, resection of ribs, resection of chest wall, and lung decortication. Without naming the etiological factors, empyema may be due to a pneumococcal, tuberculous, or pyogenic infection. The pneumococcal is far the commonest but fortunately runs a favorable course without becoming chronic. The tuberculous and pyogenic usually become chronic. I am of opinion that the success of the treatment of empyema depends on the early recognition of the condition, and then immediate evacuation of the pus by aspiration followed either by the injection of ether in full strength or by the irrigation with ether in dilution. The beneficial effects of ether are due to the same factors which assist generally the vital resistance.

Joint cavity infections.—According to Doctor Murphy (14) every type of a nontraumatic joint inflammation is a metastatic manifestation of a primary infection in some other portion of the body. It is in the acute pyogenic arthritis (metastatic) and in the tuberculous synovitis, especially

tuberculous hydrops, that good results are obtained from the use of ether. When a joint cavity becomes infected with pyogenic organisms, a purulent inflammation is produced, pus fills the cavity and distends it, and the synovial membrane becomes thickened. In the pus killed or paralyzed white blood corpuscles are abundant, and the proteolytic ferment is active. In the thickened synovial membrane microbes are imbedded. In this infected cavity the antibacterial agencies of the body are overcome by the mass effect of the infecting bacteria. The further changes, as in the ligaments and cartilages, are not under our present consideration, because the treatment that I wish to describe, to be of value, must be begun early, before the destruction of the synovial membrane and cartilage and the formation of fibrous and bony ankylosis have taken place. The ankylosis of a joint is produced by the increased interarticular pressure and the muscular contraction. A joint capsule is capable of sustaining a high intraarticular pressure before it can be ruptured.

In principle I follow Murphy's method of treatment, substituting ether for the formalin in glycerin solution. Mechanical and therapeutic agents are used in the treatment, which is as follows: 1. Aspirate the joint cavity to evacuate the shut up accumulation of the infective products and to relieve the intraarticular pressure. 2. Inject ether which increases the mass effect exerted by the antibacterial agencies of the body to overpower the infecting microbes. 3. Apply extension and weights to overcome the muscular contraction. 4. Reaspirate and reinject ether if the joint refills and you find it necessary to evacuate it, until you bring the antibacterial agencies of the body into more effective operation and final victory.

Experimentally (15), when injected into the healthy joint of an animal, ether was rapidly absorbed, and the effusion it produced was small and scanty in cells. As in the peritoneal experiments, the endothelial cells predominated during the earlier period and were replaced later by the polymorphonuclear cells. After one week, when opened, the joint was found perfectly normal. The joint, into which ether was injected some minutes after its inoculation with a bacterial culture and which was opened seven to ten days later, appeared normal, save that it contained a minute amount of white, structureless, caseous material. Without the injection of ether, a joint inoculated with the same bacterial culture and examined seven to ten days later, was found markedly swollen and it contained a large amount of pus.

CONCLUSION.

Whereas, all evidence seems to show that the attack and destruction of the invading organisms by the system is accomplished by one of two means, either intracellular by phagocytosis or extracellular by the natural fluids of the body; and whereas, Shaffer's results (16) point to the latter as the more rapid and more effective mean; we, therefore, can readily reason and understand why ether is of value against infection. It quickens the regeneration of embryonic tissues. It produces active hyperemia, increasing the exudation of the vessels, and

inducing the solution of the leucocytes, and so brings about the more effective mean that the system has to overpower and destroy the agents of infection.

Since completing this paper, I have read with much interest J. Frank Corbett's article (17). In his conclusions he states: "Ether seems to be the most satisfactory chemical means of combating infection." Sir Herbert F. Waterhouse, W. Douglas Harmer, and C. J. Marshall (18) also describe good results from the use of ether injections in cases of metastatic pyogenic arthritis. In a report (19) on the Carrel Treatment of Wounds, received by the director general of the army medical service, England, by a committee which visited France last summer, the following statement appears: "In the Annel hospital we saw three fluids used with Carrel's tubes: Dakin's fluid, eusol, and ether. We were assured that good results were obtained from each of them. One of the surgeons, M. Lefebvre, expressed a preference for ether. One advantage of ether over other antiseptics is that the outer dressing does not become wet and can often be untouched for four days."

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Cutaneous and the Intradermal Tests in the Sensitization of Asthma and Hay Fever Patients.

—I. C. Walker and June Adkinson (*Journal of Medical Research*, November, 1917) confirm the statements made in a previous study that the skin test is an index to proper treatment, being sufficiently sensitive, and yet not too sensitive. The skin test is specific, and separates closely related proteins. Under treatment the positiveness of the reaction decreases gradually and progressively, and it possesses the additional advantage of being easy to do and of not inconveniencing the patients. On the other hand, the intradermal test is very erratic, as treatment seems to have no particular effect on the positiveness of the reaction, sometimes increasing, sometimes decreasing, and sometimes not affecting it. The test is less specific and does not always separate closely related proteins, so it may be nonspecific. It is much too sensitive, so that it can not be considered a safe guide to proper treatment. It is more difficult to do than the skin test, and in addition, causes considerable annoyance and discomfort to the patient. Therefore, when many proteins must be used, the intradermal test is not a practical one.

HOW TO AVOID TUBERCULOSIS.*

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Because perpetual agitation will be the price of success in the campaign against tuberculosis, I shall repeat certain facts which you have all heard before and should never forget. This disease has been the subject of world wide attention because every third or fourth person you meet under fifty years of age dies of it and because it is the greatest single cause of poverty, misery, and sorrow. Not only the fact that it afflicts us during the most useful time of life, but that it results in a prolonged, chronic, disabling illness, causing tremendous financial loss, makes it one of the world's great problems. Only those who have suffered from it can deeply appreciate its staggering economic burden. However, as science has definitely given us the weapons for its control—segregation of its victims and their complete supervision by institutions and public health nurses—we can omit this phase and directly consider what the individual himself can do.

To facilitate this, we should briefly review the general character of the ailment. It is one of a group of so called tubercular diseases, but all of them are not tuberculous. These are called "tubercular" because each is characterized by nodules or tubercles, therefore you will see a tubercular person does not necessarily have tuberculosis, and that to call a hospital tubercular is simply ridiculous. This mistake is made daily by the press, journalists, and even physicians themselves. The tuberculous patient is tuberculous, meaning he has tuberculosis. Intelligent people should understand this distinction. Tuberculosis may affect practically any part of the body at any time, but most often it affects the lungs, and less often the bones, glands, brain, intestines, and other organs. A human victim may give his disease to animals, and in some cases may likewise contract it from animals, especially from the cow. An exceedingly interesting theory, which is being generally accepted today, has resulted from recent research. It seems extremely probable, that few of us escape infection in early childhood, but this early infection does not give us any permanent immunity, as in mumps and measles; and during young adult life the disease may again break out or a new infection be acquired. It does, however, seem to confer enough immunity to enable many of us to pass through life with no serious results.

With the greatest emphasis I must state that the average individual, except in early childhood, does not get tuberculosis except after continuous, prolonged exposure, and then usually under most adverse living and working conditions. Obviously these conditions are best seen among the poor, and naturally the prolonged contact is in the family. As the lung disease is by far the most dangerous and widespread, we shall limit further consideration to that alone. The germ or tubercle bacillus having once gained foothold in the very delicate lung tissue, it grows rapidly, destroys the tissues, and

throws off poisons which produce the well known symptoms, loss of weight, weakness, fever, rapid pulse, cough, and expectoration. Under favorable conditions, the individual may strengthen his resistance so greatly that the germs themselves are overcome and the destroyed tissues heal, often leaving an actual scar as may be seen after any injury to the body. Here you must realize the most difficult and dangerous thing about tuberculosis, and that is, the physician can tell quite accurately when the patient has won the fight and overcome the germs, and such a patient's condition is said to be "arrested" or "apparently cured," but no physician can tell whether the germs are really dead or only sleeping, therefore no wise physician tells the victim that he is "cured." A relapse may occur even under favorable conditions and many victims have rejoiced in the thought of being cured only to suffer relapse and death eventually, sometimes years later. Why should all this interest you? Because those things which keep the "recovered" patient well can also protect the well person from the sick.

I wish to condemn in the strongest possible manner the utterly unreasonable fear of tuberculosis which is so manifest everywhere. This has resulted in great hardship for many tuberculous patients. Unlike many communicable diseases, it requires more than one exposure to contract it, therefore it is of little or no practical importance for you to avoid the individual patient. It is important for you to remember, however, that tuberculosis is a house disease, a malady of those who live in unfavorable housing conditions. Sunlight and daylight are the germ's worst enemies. Sunlight kills the bacillus in a few minutes. The breeding place of the disease is the dark, damp, dirty, crowded and poorly ventilated house, workshop, office, factory, store, church, and lodge room, especially when these are infected by the expectoration of a careless consumptive. If it were possible to compel every such patient to cover his mouth when coughing and dispose properly of his sputum the disease would quickly disappear. This will be accomplished when there are enough tuberculosis hospitals to care for the majority of patients. It is close, constant, association with a consumptive who spits, coughs, and sneezes carelessly that is most dangerous in this, as in most other communicable diseases, the common cold included.

The greatest danger is to children, as they are most easily infected. The disease may linger long, as long as six months, in rooms which have been occupied by a careless patient. Not pious fumigation but ordinary thorough cleaning up can make such places safe. Sunlight and soap and water are a great protection anywhere. A common danger everywhere is dust, and dust itself is largely the result of carelessness. City dust is due chiefly to smoke and building operations, both of which are controllable. In the home and work place dust is the conveyance for the germs to your lungs. But in the streets, dust is the weapon which scours and literally plows up your throat and lung tissues for the germs to be sown, from which you later reap a harvest of tuberculosis, pneumonia, colds, and other afflictions of these organs. Consumption is

*An address delivered to the city employees at the Municipal Building of the City of New York, December 6, 1916, under the auspices of the Committee on Education of the Welfare Committee of the Borough of Manhattan, Leonhard Fuld, Ph.D., chairman.

so widespread, that wherever a number of people are gathered or where many frequently chance to be together, the infection is present also. Therefore in many workshops, offices, lodge and club rooms, theatres, etc., the infection is constantly present, and if they are not kept well cleaned the danger is great to those who occupy them; and it is very great to those who work along side of careless consumptives in such places or anywhere else. You well know, of course, that the disease may enter the body in raw milk from a tuberculous cow; this is an uncommon source for adults but a common source for children. About one third of little children who have gland tuberculosis acquire it from infected milk. This condition is unimportant in New York because practically all of your milk supply is pasteurized.

You are thinking perhaps at this point of heredity. It may be mentioned briefly that the disease is not inherited. There is, of course, every possibility of a child born healthy becoming infected from a tuberculous parent soon after birth. Whole families are wiped out by the disease, not because they inherit it, but because they contract it from one another. It is also true that tuberculous parents often have children with lowered resistance, and this in turn is often increased by the poverty so common in such families. In this manner poverty is not only a result of the malady, but also a contributory cause. The person who knows how to avoid tuberculosis, also knows how to avoid many other diseases which bring many victims to untimely graves. It has been said with much truth, that the most important result of the tuberculosis campaign has been not the prevention of the disease itself, but rather the very great educational effect upon the people generally; it has taught them how to live. Therefore it may be most practicable now to summarize briefly what you can and should do, as individuals, to avoid the disease:

1. It is your duty, part of your personal responsibility as a free citizen under a democratic government, to stop careless spitting. Public sentiment against this dirty habit must become so strong that nowhere will it be tolerated.

2. Do all in your power to keep the place in which you live and work absolutely clean, and especially to prevent dust.

3. Insist upon fresh air and sunlight at all times and in all places; become a fanatic on the subject. Fresh air fanatics are very badly needed. They are especially needed on railroad trains, in drawing rooms, in many offices, and alas, not only in many theatres but also in many lodges, clubs, and churches.

4. Never occupy a new home until it has been thoroughly cleaned and aired. Prefer places that have exposure to sunlight.

5. It is almost superfluous for me to add, finally, keep clean in body and mind; be moderate in all things; eat only plain, wholesome food; drink and smoke in moderation or not at all. It is best to abstain entirely.

6. Last of all, everything that you can do to make life healthier and happier helps to avoid tuberculosis—better wages, better working hours, better

food at lower prices, playgrounds for children and adults, better factories, schools, homes, and work places. We can do no better than try to live healthy, happy, and useful lives, and assume a strict personal responsibility, as is our civic duty in a republic, to see to it that opportunities for these things are available to all the people, but especially to those less fortunate in life than we ourselves.

17 SOUTH HAWK STREET.

THE HEARTPHONE.

A Newly Perfected Electric Stethoscope.

By C. C. HENRY, M. D.,
New York.

Realizing, after much testing, the value of the newly perfected electric stethoscope, the heartphone, and its superiority over the old type, I wish to express my confidence in it to the medical profession and to tell them briefly something of its construction.

The introduction of an electrical stethoscope, newly devised and thoroughly tested, gives to the medical profession an opportunity to investigate more minutely those physiological and clinical conditions which require auscultation. The principles of this stethoscope are similar to those of the telephone. Since electricity transmits sound waves about 20,000 times faster than air, it follows that there is no overlapping of sound waves and the effect upon the ears is more distinct. While several attempts have been made to produce an electric stethoscope of practical use, and some have approached the ideal, none has succeeded to the degree that has been reached by the heartphone. It is a simple, practical instrument of marked efficiency and it is small enough to be carried in the pocket.

Briefly, the component parts are a transmitter, a receiver, a battery, and a regulating controller. The transmitter casing is so constructed that a large, medium, or small surface may be examined; it completely encloses and protects the mechanism, including a free vibrating diaphragm, which transmits the sounds unhampered to the receiver. The sounds are then passed on to the ears through soft rubber tubes protected by metal tubing. A sound regulating controller is placed on the cords between the transmitter and the receiver. This controller consists of twelve resistance units with a thumb slide, giving a range of adjustment to suit the individual and enabling the examiner to cut out the louder sounds, if only the minor ones are under study. For practitioners with defective hearing, the heartphone will be found of special interest, as sound conveyed electrically is clearer and more penetrating. Sounds that cannot be heard by means of a mechanical stethoscope, may be heard by the use of this instrument.

In my experience with it, I find that it will do all and more than the air conduction instrument will do, and with greater reliance. To America belongs the credit of this instrument. The inventor, Mr. Gottschalk, is a descendant of families who were among the early settlers.

664 EAST EIGHTEENTH STREET, BROOKLYN.

Abstracts and Reviews.

FOOD CHEMISTRY IN THE SERVICE OF HUMAN NUTRITION.*

By HENRY C. SHERMAN, B. S., Sc. D., A. M., Ph. D.,
New York,

Professor of Food Chemistry, Columbia University.

The lecturer began by saying that it was his purpose to speak of the application of food chemistry to the problems of human nutrition, especially with reference to the economic phases of the present situation and to consider how best to secure adequacy of nutrition along with economy of food. Economy of food at the present meant both the wisest expenditure of money and the conservation of the country's food resources in such a way that we would be able to send abroad to our Allies and our army the greatest amount of foods suited to their needs and fitted for transportation. By way of introduction it was pointed out that an adequate diet should meet five requisites: 1. It should contain digestible organic nutrients sufficient for the caloric needs. 2. It should supply a sufficiency of suitable proteins. 3. The inorganic constituents, or ash, should be present in adequate amounts. 4. There should be an abundance of the vitamins. 5. Finally, the physical character of the diet should be such as to insure its proper handling by the digestive tract.

The recent rapid progress in the knowledge of nutrition had tended to complicate our conceptions of nutritive requirements, but, at the same time, it had made the problem clearer since probably all of necessary food constituents had now been recognized and could be dealt with, even though the chemical nature of some of them was not yet completely known. The recent researches on nutrition, which were largely the products of American workers, had now given us a fairly accurate knowledge of the total nutritive energy requirements of man under varying conditions of rest and work. While this was certainly true of the total energy requirements, our knowledge of the requirements of some of the individual nutritive materials was not yet so accurate.

The protein requirement was one of those which had not yet been sufficiently determined and in the establishment of which many factors demanded consideration. Thus the low protein requirement of forty-four to fifty-three grams a day for a seventy kilogram man, as determined by Chittenden, had been criticised by Meltzer and by Benedict. Meltzer contended that the usual high protein consumption provided a factor of safety which was wanting in the low protein diets. According to Benedict, the utilization of other foodstuffs was also better in the presence of a high protein intake than in a low one. This might possibly be explained in part at least by the fact that hydrolytic enzymes were either proteins or contained proteins as essential constituents. In addition the need for a considerable variety in the aminoacids derived to varying degrees from different proteins seemed to point to the need of a greater protein consumption than

the minimum requirement. On the other hand the maintenance of a nitrogen balance on a low protein diet would seem to indicate that the diet met all of the protein requirements, and it seemed unlikely that such a diet was seriously deficient either in kind or amount of protein. The author's analysis of eighty-six observations on normal, healthy adults, made in twenty independent investigations showed a wide range of apparent protein requirement, but the average figure fell within those determined by Chittenden. While the feeding of isolated single proteins to growing animals brought out the nutritive deficiency of many of them it should be remembered that an adequate supply of each aminoacid was essential for growth whereas in the full grown adult tissues any native aminoacids might be expected to contribute to the maintenance of nitrogen equilibrium. Finally, the use of diets made up of the usual staple articles might be assumed to provide a sufficient variety of the necessary protein constituents. In this connection it had been shown that potato and wheat nitrogen were highly efficient in maintaining nitrogen balance in adults.

The protein sparing action of the fats and carbohydrates, the lecturer said, was a matter which deserved consideration here. It should be borne in mind that protein metabolism was essentially a series of reversible reactions which maintained an approximate equilibrium in the body. In the adult the tissues always contained protein and aminoacids in approximate equilibrium and the supply of aminoacids was constantly being augmented by the digestion products, while simultaneously the supply was constantly being reduced by deamination. Where the supply was greater than the destruction the rate of protein catabolism was of necessity checked. The intake of ammonia salts also might check the process of deamination and aid the maintenance of nitrogen equilibrium. Ammonia might also contribute to the formation of aminoacids, which fact served to explain the protein sparing action of the carbohydrates. Thus alanine was one of the protein aminoacids which could be derived from protein, or from carbohydrates or fats through pyruvic acid. The amount of alanine which could be derived from fats through pyruvic acid was very small, but that from carbohydrates was large, hence the latter were more efficient than the former in the role of protein sparing foods. In war diets economy of sugar and fats was necessary, but an abundance of other carbohydrates than sugar would be taken so that the protein sparing action of this class of foods would still remain high. Although but few aminoacids could be derived from carbohydrates, feeding experiments had proved the efficiency of the protein sparing action of the carbohydrates.

From these and other observations brought out by the lecturer it was concluded that the adoption of a standard protein allowance fifty per cent. above the average protein requirement would be an ample provision for all save growing children and nursing women.

Other food constituents which had not yet been sufficiently studied were those of phosphorus and calcium. The author had made a large number of careful observations on both of these materials and

*Summary of a lecture delivered before the Harvey Society at the Academy of Medicine, New York, January 12, 1918.

had also analyzed other available data. The results processed information upon which standards similar to those for protein could be established. The three requirements and proposed working standards were shown as follows:

DAILY REQUIREMENTS AND STANDARDS FOR 70 KILOGRAM MAN.

	Protein	Phosphorus	Calcium
Requirement	50 gm.	0.96 gm.	0.45 gm.
Standard	75 gm.	1.44 gm.	0.68 gm.

The standards suggested did not mean that the intake of less than the amounts stated would necessarily lead to disaster, but it was a convenient basis for grouping dietaries as to their margin of safety in respect to these constituents.

The use of foods from the vegetable kingdom and of milk was essential if the requisite amounts of the mineral constituents were to be provided. A large number of representative American dietaries, taken from various sources, were analyzed with reference to their provision of these three food constituents and it was found that the protein intake was almost invariably adequate, but that in a very considerable proportion both of the mineral constituents were low. The most frequent deficiency was in calcium. The iron requirement was less certain than those of phosphorus and calcium, but it could be approximated. The representative diets showed a better margin of safety in iron than either of the other minerals, but a smaller margin than that of protein. Where there were children in the family the allowances of all of the constituents had to be increased and the amount of each should be proportional to the child's energy requirement. On the basis of the proposed food allowances in terms of calories, children should receive 2.5 grams of protein in 100 calories; 0.048 gram of phosphorus; 0.023 gram of calcium; and 0.0005 gram of iron in 100 calories. The protein should be supplied mainly in the form of milk.

The vitamine requirement could not be stated in terms of weights of the "A" and "B" fractions, but in general those foods which were rich in calcium were also rich in the vitamins, e. g., milk, eggs, vegetables, so that provision for the former should take care of the latter.

The application of the knowledge of food requirements to the choice of foods could be made in several ways, but in whatever way, provision should be made for an adequate supply of the essential building materials including the mineral salts and vitamins as well as protein. Perhaps the simplest and most satisfactory plan for providing a balanced dietary for general use was, in the author's opinion, that of the food budget, which though less scientific than others, appealed to the layman. A study of representative American diets showed the amounts spent for each type of food. The food value of the diets was also shown. If the proportional expenditures were rearranged so that at least as much of the money went for milk as for meat, and as much for fruits and vegetables as for meat and fish, with no fixed proportion set for the other foods including the starchy foods and breadstuffs the total food value of the diet, for the same amount of money spent, was increased.

The saving of fats, sugar, meat, and wheat could

be accomplished without any reduction in the efficiency of the diet, either in caloric value or in balance, and, in fact, through the greater proportional use of milk, starches, and vegetables and fruits, the resulting diet should be even better balanced than the customary diet before the war. The partial substitution of wheat by the coarser grains and by oatmeal and corn and potatoes should result in an improvement in the mineral and vitamine content of the diet.

In closing, the lecturer referred to the much discussed element of psychology of the diet, which, it was contended, made it difficult for many to adapt themselves to unfamiliar articles of diet and to articles with somewhat altered physical properties, such as color and taste. He questioned whether there was not a psychology of conviction or of patriotic spirit as well as of habit and prejudice which might lead us to a fuller appreciation of the needs of the present day. If there were such, might not the bread tasting of corn or changed in color by oatmeal flour come to be a more worthy staff of life than our accustomed pure white loaf?

Intravenous Isotonic Sugar Injections in Septicemia.—G. Audain and F. Masmonteil (*Presse médicale*, November 8, 1917) find that massive intravenous sugar injections in isotonic solution cause the leucocytes in the blood to rise within half an hour from 5,000 or 7,000 to 25,000. The latter figure is maintained for two or three hours, after which the number decreases to 16,000. The polynuclear cells predominate in the reaction, constituting eighty to ninety per cent. of the total count. Clinically, there is observed soon after the injection by a transitory rise in temperature of a few tenths of a degree C., preceded by a chill and followed by a sweat. The maximum temperature coincides with the maximum leucocytosis. In septicemia, such injections assist the organism by greatly stimulating the production of leucocytes; in fact, at present this form of stimulation may be considered the only rational treatment of infections. The daily introduction of 100 grams of sugar is of nutritive importance in these always anorexic patients; diuresis is also excited by direct action on the renal cells. The solution being isotonic, no hemolysis is produced by the procedure. Glucose solution is isotonic at 47.6 in 1,000; saccharose, at 103.5 in 1,000, and lactose at 108.9 in 1,000. In fresh subjects, 300 to 500 grams of solution are injected to excite the leucocytic reaction. In patients already injected, or in grave septicemia, one may inject 1,000 to 2,000 grams a day in two or three doses. The leucocyte count is a guide to the amount to be employed, enough being used to keep the count at about 25,000. Practically, a pronounced chill within an hour after an injection signifies that the proper limit has been reached. In a few days the temperature in septicemia is reduced to normal. Sometimes two or three 500 gram injections are sufficient. In other cases the amount of fluid has to be increased and the treatment continued ten or twelve days. It should not be entirely stopped until four or five days after return of the temperature to normal.

Medicine and Surgery in the Army and Navy

PNEUMONIA AMONG SOLDIERS IN CAMPS, CANTONMENTS, AND AT THE FRONT.

Causes, Prevention, Treatment, and Aftercare.

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New York,

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[Published by authority of the Surgeon General of the United States Army.]

Besides the casualties inevitable in a war of the magnitude of the one we are now waging, there is always a certain amount of disease. Concerning the present pneumonia epidemic in our camps and cantonments, let us bear in mind that when any disease, epidemic or endemic, increases in prevalence among the civilian population, we cannot expect military life to present an exemption. When we have a severe epidemic of measles or a serious increase in the number of pneumonia cases assuming epidemic proportions in a given locality, it cannot be expected that cantonments or camps where large masses of troops are congregated should be immune.

The morbidity and mortality from pneumonia seems to have been higher everywhere this winter. The following figures for New York have been kindly given me by Doctor Bolduan, director of the Bureau of Public Health Education of the Department of Health:

	Last week in October	First week in November	Second week in November	Third week in November	Fourth week in November	First week in December
1915	71	83	90	108	141	165
1916	144	149	150	159	162	184
1917	155	150	164	188	233	249

These figures speak for themselves but I do not offer them as an excuse for the negligence which, according to the Surgeon General's own report, has been responsible for the relatively large number of pneumonia cases in our cantonments and camps. Overcrowding, insufficient clothing, poor plumbing or none at all, hospitals without water supply and the location of camps in epidemic centres are conditions which urgently need to be remedied and no efforts should be spared to do away with insanitary conditions where our soldiers are receiving their training, and to provide our troops with proper and sufficient clothing. The men, no matter in what station, who are responsible for these adverse conditions cannot be too severely censured. As for that group of men who, out of greed and a desire to enrich themselves, consciously and deliberately furnish insufficient and improper clothing or delay its delivery, their punishment should be made to fit the crime. At a time when every true American should not only do his duty but make real sacrifices, they thought only of the profit they could make by the situation and ruthlessly allowed our soldier boys to suffer and die. Thus many a brave American boy has lost his life through the carelessness or greed of others before he could enter the ranks and fight in the war for liberty, the great cause for

which he would gladly have sacrificed his life. May criminal negligence of this character never again darken the bright pages of the history of America's entrance into the world war and may we learn a lesson through this sad experience.

CAUSES.

Our knowledge of the causes of pneumonia has of late been greatly enriched by the experiences and experiments of Dr. Rufus Cole, his collaborators at the Rockefeller Institute, and his coworkers and pupils elsewhere. It is now established beyond a shadow of doubt that in the vast majority of instances acute lobar pneumonia is transmitted from one individual to another; that each case of pneumonia constitutes a centre of infection; that individuals who come in close contact with patients ill with pneumonia may become pneumonia germ carriers; and that the dust in rooms occupied by pneumonic patients becomes infected. We are therefore justified in considering acute lobar pneumonia an infectious and communicable disease.

The invaluable information which has come through the researches of the Rockefeller Institute has shown further that there are four distinct types of pneumococci, that acute lobar pneumonia is most frequently caused by types I and II, and that Type IV is that type of pneumococci found most frequently in normal and healthy individuals and in secondary pneumonia, as for example that which often follows measles. According to Doctor Cole, "the facts concerning the infection with Type III are still somewhat obscure." The number of cases due to this type of infection, however, is relatively small. Of greatest importance is the knowledge gained concerning types I, II, and IV in their relation to the factors which make the individual more or less liable to disease or increase the virulence of the pneumococci which have invaded the patient's system. To make this matter as clear as possible, I use Doctor Cole's own words: "The patient acquires the disease because the organism causing it gains access to the body. In no infectious disease, however, do all individuals who receive the infecting agent contract the disease. In all instances the person attacked must be susceptible and the amount of virus must be sufficient."

Concerning Type IV, that is to say, those pneumococcus germs which are frequently prevalent in the normal individual, he tells us that in the disease arising from this type of germs contact infection may be considered of relatively little importance, yet he urges us not to take this matter into consideration in our preventive measures. I most heartily endorse him when he issues this warning: "The easiest way to increase the virulence of bacteria for animals is to pass them through a series of such animals. Probably pneumococci of Type IV repeatedly causing infection in man may grow more virulent for man." In this statement by a master of modern pneumonia therapeutics may we not have an explanation of the relatively high mortality in many epidemics?

Under normal conditions natural resistance pro-

fects the carrier of Type IV from developing pneumonia. Natural resistance again protects the individual from contracting pneumonia from types I and II and he must have been in prolonged contact with a pneumonic patient and have taken into his system a large number of the pathogenic germs, types I and II, before pneumonia will develop. But if the individual's resistance is lowered, even a relatively small number of germs may get the upper hand and he will become a victim to the disease. This resistance may be lowered by privation, exposure to cold and wet, overfatigue, the inhaling of vitiated air, excesses of all kinds, etc. Then the pneumococci multiply and may even become more virulent than they were formerly. The individual suffers from the poisonous secretions of billions of pneumococci, often associated with pus creating organisms such as the streptococci and staphylococci. These toxins are responsible for producing the characteristic symptoms, beginning with a violent chill which may last from fifteen to thirty minutes or even longer, and is followed within a few hours by intense agonizing pains in the side of the chest, a short, dry, and painful cough, accompanied by increasing difficulty in breathing, and high temperature.

Cases of pneumonia which appear isolated here and there as a result of lowered resistance are constantly with us and are classified as endemic. When because of certain climatic or atmospheric conditions, very insanitary housing, great prevalence of measles or grippe a large number of persons are simultaneously attacked by pneumonia, we are justified in considering the outbreak as epidemic. The greater the number of pneumonia carriers in the community at such times, the greater is the danger of the epidemic becoming more and more severe. Since it is impossible to determine who is and who is not a carrier of those types of pneumonia which are productive of the disease, we must use precautions which will decrease to a minimum the possibility of pneumonia being transmitted by conscious or unconscious pneumonia germ carriers. Because clinical and laboratory experiences have shown that a lowered vital resistance facilitates the invasion of the human system by all pathogenic microorganisms, including those of pneumonia, let us see what can be done along the line of prevention to remove those two causes of pneumonia, particularly among our soldiers in camps and cantonments.

PREVENTION.

All health authorities must recognize that lobar pneumonia is an acute infectious and communicable disease and should make it a reportable one, and all physicians should help by reporting their cases as soon as diagnosis is made. In cooperation with the health authorities they should at once institute such sanitary, hygienic, and preventive measures as will decrease the morbidity and mortality of the disease. The public must be instructed in the importance of every individual holding a hand or handkerchief before the mouth when coughing or sneezing. This precaution should be particularly observed in times of grippe or pneumonia epidemics and in midwinter when there are many people suffering with nasal and laryngeal catarrh or bronchitis. It should be

made known particularly that promiscuous spitting, coughing, and sneezing in close compartments is more responsible than anything else for the propagation of respiratory diseases, including pneumonia.

Promiscuous spitting is a bad and dangerous habit, and this is one thing that can be done away with even in the discomfort and inconvenience of camp or trench life if we could have the interest and good will of the intelligent soldier. The soldier should possess all the qualities of a good citizen who bears in mind the fact that the health of every man adds to the health and wellbeing of all. To spit anywhere where the sputum is liable to dry and become pulverized is a danger to oneself and others as it may cause the spread of a number of different diseases. The anti-spitting campaign that has been waged by all the health authorities in the country has begun to show good results in civil life, and while it still needs emphasis in military life it should also be supplemented by a warning against the careless cougher who spreads his disease by droplet infection just as surely as the careless spitter. I hope that some division surgeon will improve on the practice of the civilian sanitarian by adding in his health ordinances or placards, placed on the walls of the barracks, an item calling the attention of the men to the danger of promiscuous spitting and careless coughing and sneezing. Every one should refrain from spitting in street railway cars and other conveyances, and particularly when indoors, in tents, barracks, trench, or dugout, and should hold his handkerchief or hand before his mouth when he sneezes or coughs. Let him remember that there is no such a thing as a dry cough and that with every cough small particles of saliva are expelled which may contain disease producing germs, such as measles, whooping cough, influenza, tuberculosis, and as already said, pneumonia. We are not quite certain that even spinal meningitis may not be transmitted in the same way. For his own sake as well as that of his colleague and in order to maintain the efficiency of all the comrades with whom he may come in contact, in short, as a patriotic duty, the American soldier should never cough or spit without exercising these precautions.

Every one should bear in mind that the secretion from the nose as well as the saliva often contains the germs; therefore care should be exercised in the handling of handkerchiefs. It may not exactly fit in an article intended to prevent pneumonia among soldiers to speak of the deplorable habit of some fathers and mothers or older brothers and sisters of using their own handkerchiefs to wipe the running noses of children, or to call attention to the fact that children should never be kissed on the mouth. Some of our soldiers are fathers, however, and I hope many will be some day, so perhaps I may be forgiven for injecting this little warning for the purpose of protecting children from the danger of having diseases transmitted to them by this kindly meant but deplorably insanitary practice. When the pneumococci are exposed to the sun they die within a very short time, approximately within an hour; but in a dark, badly ventilated tent, barrack, or bedroom they retain their vitality in the sputum for several days. When suspended in the

air with the dust they live for several hours, and often longer. In every room, barracks, armory, and public building there should be covered cuspidors which can be opened and closed with the foot (Fig. 1). The cover will prevent insects from getting at the sputum.

To prevent overcrowding and to provide thorough ventilation in tents and barracks and, if possible, even in the trenches, are, of course, matters for the attention of the medical officer of the regiment. Men sleeping in tents and barracks, or housed elsewhere, must bear in mind that they can help secure good atmosphere to breathe when they are in their quarters. The air of a tent when heated by a stove can become very vitiated unless care is taken, and the smoke from these stoves or from half a dozen men smoking cigarettes or pipes may be very injurious. Excessive smoking, especially of cigarettes when the smoke is inhaled, is apt to injure the respiratory system and make it more susceptible to disease, weaken the action of the heart, impair the function of the nervous system, and lessen the general efficiency. One who has never smoked would better not acquire the habit.

It is well known to all sanitarians that our American method of heating houses by hot air furnaces is a frequent cause of the development of nasal and pharyngeal catarrhs and subsequent bronchitis. Wherever this method of heating is used there should be some kind of humidifying apparatus which will make the air sufficiently moist to prevent the drying of the mucous membrane of the upper air passages. I am convinced that going outdoors on cold days from the dry air of an overheated room, often insufficiently protected against the sudden change from hot to cold, produces many pneumonia cases. Experience has proved that we can be perfectly comfortable in an indoor temperature of 60 to 65° F. and even a little lower, provided

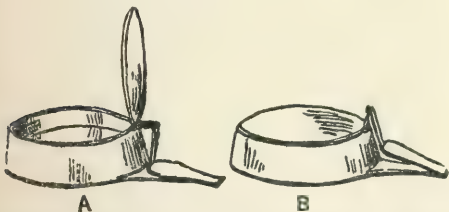


FIG. 1.—Metal floor cuspidor with large opening. It should be partly filled with wet sawdust. The cover is worked by foot. A, open; B, closed.

that the percentage of moisture is 60° F. If this moisture falls to thirty or twenty per cent., the dry throat, nose, and skin are in evidence. To avoid the much and justly feared droplet infection at night when the men are sleeping and cough unconsciously, it is well to insist upon the beds or cots being so arranged that the heads and feet are placed alternately, i. e., so that the foot of one cot comes next to the head of the adjacent one; thus the droplets of the coughing sleeper cannot reach the neighbor's face. If at all possible, the beds or cots should be at least three feet apart. The dry sweeping of the floor of a barrack should be prohibited. Wet pieces of newspaper strewn on the

floor will catch most of the dust and make the cleaning just as thorough and more sanitary. Since the soldier's calling necessitates exposure to the inclemency of the weather, severe heat, cold and wet, extreme fatigue and overexertion, we must strive all the more to protect him against the influence of these extremes. Besides proper underwear, woolen shirt, warm stockings, and well fitting and substantial shoes, his outer garments must be of sufficiently tightly woven material and so fitted as really to protect him. Can we improve on the soldier's equip-

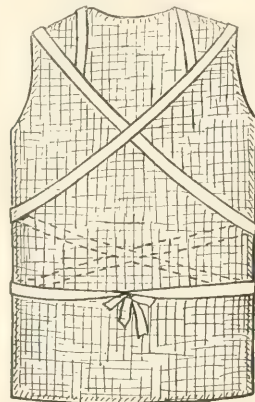


FIG. 2.—Back protector, showing tapes as they are tied around the body.

ment in this respect? There is all reason to believe that Surgeon General Gorgas's efforts to provide the proper clothing for the troops under his care has already met with success and will meet with greater success in the future. It has been asserted that the gray field uniform of the German trooper is fifty per cent. heavier and warmer and more costly than the winter uniform worn by our soldiers. Cloth experts maintain that there is little difference in warmth and durability between all wool clothing and clothing of reworked wool, i. e., shoddy mixed with wool. So it would seem that in future equipments warmer overcoats can be provided for our men, particularly for those in training and at the front, without increasing the expense. However, it might be well to create a board of disinterested cloth experts to determine what is warm, good, suitable, and economic cloth for the uniforms of our soldiers.

To furnish thousands or millions of new and warmer overcoats or uniforms requires time, and it has occurred to me that something might be done at once and without delay that may be productive of much good. In civil life we often see men wearing double breasted overcoats, a double breasted sack coat, and even a double breasted vest, while the covering of his back consists of a thin lining of his vest and the two layers of covering produced by coat and overcoat. The layers of cloth and lining of the military field uniform is not quite so foolishly distributed, inasmuch as the coat is single breasted and only the overcoat is double breasted.

The muscular and bony layers protecting our lungs in the back are not any thicker, if as thick, as those of the anterior portion of the chest. In most animals, and particularly the fur bearing animals, the hairs on the back are much larger and thicker than those covering the breast. When a man contracts a chill, he usually feels the chilly sensation first in the back, and yet it is there that we have comparatively the least protection. In the making of uniforms in the future I would suggest a double lining in the back of the overcoat and perhaps even a double lining in the back of the coat. In the meantime, however, I would suggest that we manufacture suitable back protectors for our soldiers in camps and cantonments. Fig. 2 accompanying this article illustrates such a garment. It shows the simplicity, the ease with which it can be attached and worn, an average size can be made to fit almost any individual, and last but not least it can be made for a comparatively low price.

Our soldiers can not always select their quarters. Sometimes they even have to lie on the ground to get a few hours of rest. Trench life in winter is particularly hard and the sooner and quicker we can get some kind of a garment to them which will keep them warmer than they are now, the better for their health and let us hope, the fewer the pneumonia cases. As the accompanying drawing (Fig. 2) shows, two layers of flannel, or perhaps better yet, one layer of thick flannel and one of tightly woven lighter material, are sewn together and shaped so as to cover the back of an average sized man. Two long pieces of cotton tape are attached at the shoulders in a manner to fasten the back protector in place and not to interfere with the movements of the arms, nor to wrinkle or make putting on outer garments inconvenient. This back protector can be worn either between the undershirt and flannel shirt, under a sweater, or between flannel shirt and outer coat. The immediate manufacture and quick delivery of thousands of such back protectors should, however, not discourage women from hereafter knitting the sweaters with a double back. I had such a sample sweater made for me and would consider it equal to the back protector above described, but we must all realize that it would be impossible to furnish all our men in camps, cantonments, and at the front with knitted sweaters with double backs before many months should elapse.

What may we tell our men so that they themselves may help to prevent the disease from developing or spreading? From what has already been said it will easily be seen that they should be impressed with the necessity of keeping in good trim so that if they do harbor the pneumococcus germs these will not get the better of their hosts. Regular life as far as possible, keeping the bowels in good condition, drinking plenty of good, pure water, abstaining from the use of alcohol and excesses of all kinds, including excessive smoking of cigarettes, will materially help their resisting power. Everyone should keep his teeth in good condition, especially men who have had pneumonia before, that is to say, whenever it is possible they should clean their teeth after each meal and use some mildly antiseptic

solution for gargle and mouth wash. Precipitated chalk is a good, cheap, and effective tooth powder. A solution of one teaspoonful of table salt to a quart of water is good when no other special mouth wash can be had.

After many trials, Kolmer and Steinfield (1) have found that washing the mouth and gargling with the following solution will serve to destroy or inhibit the multiplication of virulent and disease producing types of pneumococci among contacts and convalescents and thereby aid in the prophylaxis of lobar pneumonia:

<i>Gm. or c.c.</i>	
1:1000 hydrocuprein hydrochloride or quinine bisulphate	0.005
Liquor thymolis	5.0
Disilled water, sufficient to make.....	50.0

Cole recommends that before a patient suffering from Type I and Type II pneumonia is discharged from the hospital, it should be determined by laboratory methods that the specific pneumococcus is no longer present in the mouth secretions. Two negative cultures should be required.

The man who is subject to colds, and as a result of a frequent invasion of the *Bacillus catarrhalis* suffers from nasal and bronchial catarrhs, is thereby made more sensitive to pneumonia than the man in normal health. There is no better known way to make oneself resistant to colds than the judicious use of cold water. One who is not accustomed to cold showers or cold plunges must go slowly. For the benefit of those not yet called to active service and eager to prepare themselves for their future tasks by becoming resistant and vigorous through the application of cold water, I will give a safe method by which one can train himself in a relatively short time to take a cold plunge or shower bath. The latter are found in some of our better equipped cantonments and prove a boon to many of our boys. Take your cold water application preferably in the morning in the following way: Stand in a tub containing moderately hot water a few inches in depth and have within easy reach a wash-basin full of cold water in which a large sponge has been placed. Squeeze out the sponge full of cold water rapidly over the back, holding it at the neck, then in front over the throat, then over each shoulder, in such a way that the whole body receives an ablution of cold water. Dry yourself quickly, not necessarily very thoroughly, and return for a few minutes to the bed which had been covered after leaving it so as to retain the warmth. Reaction is thus assured absolutely. Of course, except in a few of the cantonments, cold plunges and shower baths cannot be thought of in camps and trench life, but applying cold water to the chest whenever it is possible or exposing the chest for a few seconds to the air and then rubbing it vigorously with a rough towel until a distinctly warm sensation is felt is a convenient and safe means to make oneself resistant to the invasion of the germs of colds and other diseases. A rough sponge towel should be part of the equipment of every soldier.

Besides cold water inside and outside, deep breathing of fresh, good and pure air whenever possible is of equal importance to strengthen one's system against the invasion of pneumonia producing

germs. The simplest breathing exercise of all is to inhale deeply through the nose, raising the shoulders during the act of inhalation, moving them backward and remaining in that position, retaining the air for about five or six seconds, then exhale a trifle more quickly while moving the shoulders forward and downward. Repeat this exercise six to eight times and, when possible, repeat it after half an hour or an hour.

In order to be sufficiently conservative I have not discussed the prophylactic vaccination against pneumonia until after having spoken of individual and general prophylaxis. In doing so I know that I am in agreement with the sentiment and attitude of Dr. Rufus Cole. While the vaccine treatment as a prevention in pneumonia is still in its infancy, it is coming more and more to the front. It has been used in Negro troops from Africa by Borrel and by Lister among the South African workers. Doctor Cole, with his unflinching courtesy, has placed the latest literature on the subject at my disposal, and to every one interested I cannot too highly recommend No. 7 of the monographs of the Rockefeller Institute for Medical Research (2). From it I venture to quote the following:

Before preventive inoculation is undertaken on a large scale, certain questions must be answered: Is it justifiable or practicable to subject large numbers of men to the resulting inconvenience and loss of time in the hope of protecting a number of them from this serious disease? If this method is employed, how may the highest grade of immunity be produced, what should be the size of the dose, the site of injection, the frequency and number of injections, and what is the best form of antigen to be employed? A number of these problems are now being studied. The results of such a method of prophylaxis cannot, of course, be foretold with accuracy. We can only say that as far as experiments on animals are of value, the employment of this method would result in great saving of human life. A trial of this method in army camps has already been strongly recommended by Major Nichols of the United States Army (*Military Surgeon*, August, 1917).

I look with great confidence toward the future and hope that the untiring labors of the men now working on prophylactic vaccination may be crowned with success. In the meantime, however, may I be permitted to insist that all the well known and tried preventive measures which I have endeavored to describe should be carried out as far as may be possible. If, as we all hope and pray, prophylactic vaccination in lobar pneumonia should prove successful, a rigorous adherence to the hygienic and sanitary measures can only add to the advantage of this preventive treatment.

There is one more point I wish to discuss which I do not believe I can do better than treat under the heading of prevention. In order that as far as it is in human power our country may be spared great pneumonic epidemics, every State and every large city after the example of New York City and New York State should have laboratories prepared to examine sputum from patients suffering from lobar pneumonia and also distribute antipneumococcic serum for the cases which belong to Type I. If properly equipped and licensed private laboratories desire to manufacture antipneumococcic serum there cannot be any objection, providing the standardization is fixed. It is essential that there should be at the disposal of the Government at any

moment such large quantities of serums as may be needed in times of serious epidemics, in times of war, and in times of peace. The pathetic appeal for pneumococci serum which came from the city of Halifax when the horror of a driving blizzard was superimposed upon the explosion of a munition ship and fire that had already killed thousands of people and wrecked thousands of homes, an appeal which could not be satisfied, is alone, I trust, sufficient for the justification of my plea. The few private and public laboratories had only enough serum on hand for the patients nearer home. One Philadelphia firm was able to send 850 ampules: the authorities of Halifax had asked for 1,000,000.

Our Government allows serum to be used for six months when kept under ordinary conditions, and for an additional six months if kept in cold storage. I have it on the authority of Prof. William H. Park, with whom I communicated concerning the possible deterioration of the pneumococcic serum, that the Government position in this respect is a fair one. Thus, after these serums have been placed on the market, they may be used until a period of six months has elapsed. This regulation permits the laboratories and manufacturers to store during the summer enough serums to meet any possible emergency of winter use. Of course, every serum should be labelled for potency and date of preparation. I have reason to believe that if our Government will state to the various reliable laboratories and manufacturers the amount of serum which they should be able to place at the Government's disposal in times of war or other catastrophes or calamities of whatever kind, many thousands of lives would be saved by this provision. The experience with serum therapy has already shown its lifelong powers, and a sufficient provision of this valuable product in case of threatened epidemics is sure to help in the mastering and preventing the disease.

TREATMENT.

In spite of all prophylactic endeavors, vaccination as well as preventive sanitary measures, pneumonia will probably not soon cease to be one of our endemic and occasionally epidemic diseases. In war times, and particularly in severe cold and wet weather, cases of pneumonia will occur among our soldiers, and at times these may be so frequent as to be considered epidemic as has been unfortunately the case in our camps and cantonments this season. The treatment of acute pneumonia, however, thanks to the admirable and inestimable labors of Cole, his associates, and pupils, is not nearly as hopeless as it was in former times.

In as short an essay as this is intended to be, it is, of course, impossible to speak at any length of this invaluable serum therapy in pneumonia. For all such subjects as determination of types, methods of administration in detail such as intradermal skin test, desensitization, dosage, frequency of serum injections, and the observance of serums and thermal reactions I must refer readers to the previously mentioned work (2).

As a clinician and somewhat of a sanitarian, I may be permitted merely to point out in as brief a way as possible what can be done besides judi-

ciously administering serotherapy and thus by a combination of the two obtain best possible results. Every soldier should be as familiar with the beginning symptoms of pneumonia as with the early symptoms of tuberculosis. As soon as he receives a severe chill lasting from fifteen to twenty minutes or longer, often followed by headache and a very severe pain in the side, he should at once report or have himself reported as ill by some comrade and as soon as possible be sent to the hospital ward. A sudden attack of pneumonia should be equivalent to a serious accident in which the victim is not obliged to wait for sick call to report or be reported, but can ask at once for medical assistance. The patient should not try to walk to the hospital, but should ask to be taken there on a stretcher. All possible exertion should be avoided. The hospital sergeant on duty should see that the bed to which the patient is transferred is warmed before the patient goes into it, and even prior to the arrival of the physician some hot drink, lemonade or milk, and if this cannot be obtained, merely hot water should be administered. If at all possible, an individual room should be chosen so that the patient may remain isolated; it should be well ventilated and as long as the patient has plenty of covering and a hot water bag at his feet, the bed should be moved near the open window. If circumstances permit, the patient's bed can even be moved into the open air. In temporary and field hospitals neither entire open air treatment nor isolation in a separate room will always be feasible, yet bearing in mind Nichols's conclusive statement (3), that tent, company, and regimental contagion in pneumonia is a proved fact, we should surround the bed in the ward with tolerably high screens made of washable material in order to prevent communication of the disease by droplet infection. All this can be done by an orderly under the direction of the hospital sergeant. On his arrival the surgeon in charge will, of course, immediately proceed with the determination of the type of pneumococcus with which the patient is afflicted. Some clinicians and experimenters believe that it is perfectly safe to administer one dose of serum against Type I, prior to the determination of the type, and when the determination of the type is not feasible, two or three doses. Prof. William H. Park is of the opinion that such procedure can only be beneficial. Doctor Cole is of the contrary opinion and says: "The administration of serum is frequently followed by general constitutional reactions and, if this method were employed, many patients in whom the serum could be of no possible value, would be subjected to such reactions. The time gained would not be great, since, in most cases, the type of infection can be determined within six to eighteen hours, and during this time, if the patient is sensitive to horse serum, he can be desensitized."

The time necessary to determine the type of pneumococcus should be utilized for symptomatic treatment. To relieve the excruciating pain or "stitch" in the side from which the patient so often suffers at the onset, a hypodermic injection of 0.125 to 0.25 grain of morphine should be administered. Next to this I know of no better remedy to relieve pain and

dyspnea than the early and frequent application of dry cups over the congested and inflamed lung area. It is regrettable that this valuable adjuvant in pneumotherapeutics has been in late years so much neglected, particularly in this country. I know of hospitals where no dry cups are available. In France, not a single pneumonic case is treated without repeated cupping. Whether the truth of the theory which I heard from the lips of the great clinician, the late Professor Potain, my venerated teacher, that dry cupping relieves the congested lungs and increases phagocytosis can actually be demonstrated I do not know, but I do know from personal experience that it gives the patient almost immediate relief.

The oil of camphor in acute pneumonia was first given and described (4), I believe, by A. Seibert, of this city. He gives ten c. c. of a thirty per cent. camphor solution in sesame oil to every 100 pounds of body weight every twelve hours for unilateral pneumonia with average toxemia, and every eight hours for bilateral involvement with a severe toxemia. According to Seibert, this proved effective in so far as to decrease the temperature, pulse, and respiration; nevertheless, it required at least three days to reach practically normal conditions. The camphorated oil has been used since by a number of other clinicians in various countries, and in a recent report (5) on the treatment of French and Russian prisoners, Mallié mentions daily injections of camphor-oil, from thirty to forty c. c. in three injections, as having proved quite efficacious.

A persistent and tenacious cough is best treated by giving hot orangeade and creosote inhalation, and if the stomach is in good condition two to three drops of beechwood creosote in glass of hot milk can be given three times daily. As a general stimulant to the heart action digitalis and strophanthin are good remedies, and beginning as soon as possible after the onset of the disease one should give two drops of the fluid extract of digitalis every four or five hours which will strengthen the heart and by its cumulative effect put it in a condition of defense at the stage of crisis. At the Rockefeller Institute, if patients are treated early, they are given one gram of digipuratum at the rate of 0.5 gram a day by mouth. If they are not seen until late in the disease and appear quite ill, one gm. is given on the first day. With this dose there is usually evidence of the heart muscles being digitalized in about twenty-four hours. If the patient's condition does not indicate its further use, the drug is discontinued.

The patient should ingest plenty of water. Cole suggests as much as 3,000 c. c. or more of water a day. If the patient cannot be made to drink plain water in such quantities, lemonade may be substituted from time to time. If the patient is delirious the water should be administered by the rectum at regular intervals. The patient should of course be sponged off carefully each day with tepid water, and if the temperature rises very high careful hydrotherapy should be resorted to. All this must be done carefully and gently so as to disturb the patient as little as possible. A milk diet is of

course most suitable, but in addition cereals and soft boiled or raw eggs may be given. The bowels should be kept in good condition and it is well to clear them thoroughly at the start, but not too drastically. As already said, the patient should be disturbed as little as possible; a bed pan and urinals should be used.

If, in spite of the careful diet and fifteen to twenty drops of diluted hydrochloric acid in a glass of hot water, taken with each meal, meteorism should occur, soapud enemata should be given daily and turpentine stupes be applied to the abdomen. The milk, being often as much responsible for constipation and the following abdominal distention as anything else, should then be omitted in the diet. The insertion of a rectal tube will often help to relieve the patient from the distress caused by the accumulated gas. To combat the nervous manifestations, such as insomnia and delirium, we must again resort to morphine, but in addition an ice bag on the head, or better yet a rubber coil with circulating ice water, is a great help. Only when the cough is very severe should sedatives, such as codeine, 0.25 to 0.5 grain, or heroine, about one twelfth grain, be given every four or five hours. For edema of the lungs Osler recommends 0.05 of a grain of strychnine with 0.01 of grain of atropine, to be given hypodermically. This authority also advises venesection if the right heart is dilated.

Is there any indication for psychotherapy in pneumonia? I believe there is; in fact, I believe it is indicated in nearly all diseases. A cheerful doctor and a cheerful nurse who can dispel the gloom and know how to assure the patient that pneumonia too belongs with the curable diseases are considerable assets in the treatment. If the patient is at all religiously inclined, and most soldiers are in times of war, let him by all means be seen by the chaplain, particularly if the latter is of the cheerful kind and can speak as feelingly and reverently of glory and heaven on earth as of the heaven and the glory of the other world. Let his prayers with the patient be turned in this direction, particularly if the patient is worried and doubtful about his recovery. Prof. William James said: "The sovereign cure for worry is religious faith."

Pneumonia being a selflimited disease, I do not think that with our present knowledge anything can be done beyond what has just been described under serotherapy and symptomatic treatment. There remains, however, one more important item in modern pneumonia therapy, and that is the care of the patient after the recovery from the acute symptoms.

AFTERTREATMENT.

No matter how favorable a course the disease apparently may have taken, it is well to put the patient on some good tonic such as Fowler's solution with liquor ferri peptonati or tinctura nucis vomice with tinctura cinchona and keep him in bed under the best hygienic and dietetic conditions, near the open window or in the open air entirely. He should not be allowed to arise from the bed until four or five days after the crisis and only if the temperature has remained normal throughout this

time. If the patient can then breathe freely without pain, breathing exercises, a few at a time and gradually increasing in number, and a daily massage should be instituted. If a rise of temperature should result as a consequence of the breathing exercises and the massage, these measures should be stopped as it would be evidence that they are still contraindicated.

Any one with a fairly extensive experience in pulmonary tuberculosis who has been in the habit of taking careful anamneses, must know how frequently pulmonary tuberculosis develops after an attack of pneumonia. The time between the attack of pneumonia and the diagnosis of pulmonary tuberculosis may vary from one month to three or four years. By carefully questioning the patient it will often be found that he has never had the same vigor since he had pneumonia and ever since has had frequent colds and coughs. With soldiers the development of tuberculosis subsequently to a serious attack of pneumonia is of course quite as frequent, if not more so, than among the civilian population. It was depressing to read in Mallié's report on 244 cases of pneumonia, already referred to, as they occurred in a prison camp in the earlier years of the war. He had improved the opportunity given him by studying the difference in the mortality from pneumonia among the Russian and French soldiers at that camp. The Russian mortality was ten per cent., the French was only four per cent. In order to account for this difference the author states that the French received aid from home during part of the observation period—additional clothing and food. And then comes the statement which I quote as translated (6): "The low French mortality from the disease will necessarily be increased at a later period for the secondary tuberculosis." Why must this be? Surely because it has been is not sufficient reason that it need be. I have become a firm believer in the practice of treating every recovered pneumonic case for at least one to two months as if he had an incipient pulmonary tuberculosis, and it is with the plea that our Government may see its way clear to provide institutional treatment in a suitable sanatorium for every recovered pneumonic soldier for a few months, that I close this essay.

A large number of private and public sanatoriums for the tuberculous have already offered their accommodations to the United States Government. Yet I am free to confess I would prefer separate institutions for the pneumonic cases. I have always preached against phthisiophobia and the unjustified prejudice against sanatoriums for the tuberculous; at the same time, I can feel with the recovered pneumonic patient and can understand his dislike to enter a sanatorium for consumptives. A number of our wealthy patriotic philanthropists in various parts of the country have generously offered their summer homes to the Government for the treatment of convalescent patients. Since no special climatic advantages are necessary, pure air, quiet, and easy accessibility with ordinary sanitary equipment being all that is necessary for a home for the convalescent pneumonic, let the Government by all means accept these generous offers and

place our soldiers who have recovered from pneumonia in those homes. We will thus not only save hundreds of our boys who have recovered from pneumonia from developing tuberculosis, but we will make them fit to enter the ranks again and do their duties as soldiers as long as the war lasts and as citizens after their return from a victorious campaign when the rights of democracy shall be established and oppressed nations liberated to the everlasting glory of humanity.

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PREPARATION FOR X RAY WORK IN THE WAR.*

By ARTHUR C. CHRISTIE, M. D.,

Corry, Pa.,

Major, Medical Officers' Reserve Corps.

More than one tenth of the total number of physicians in this country, Major Christie stated, had received commissions in the Medical Officers' Reserve Corps. The American Röntgen Ray Society had been one of the first of the national societies to prepare its members for the inevitable struggle having carried on a propaganda in military röntgenology months before war had been declared. From information from those returned from active service the Surgeon General's Office had decided that the x ray work in all military hospitals should be directly in charge of medical röntgenologists.

To this end schools for instruction in military röntgenology had been organized in nine different cities. Instructors had met in New York for conference and formulated a course of instruction to be followed in all schools. The instructors were all commissioned in the Medical Reserve Corps and assigned to duty for this special work. Selected students, also commissioned in the reserve corps, were ordered to report for instruction. Special training in military röntgenology had been found to be invaluable. About 200 men, it was stated, had finished the training at these schools, some of whom were already in France; others were at the base and general hospitals in this country. At the school in New York, where the work of instruction had been concentrated, all of the various types of apparatus adopted for use in the service had been assembled and were being operated. The present plan for the instruction included a preliminary course at one of the medical officers' training camps, located at Fort Oglethorpe and Fort Riley. Röntgenologists would now enter the service through these training camps, and after one month's instruction in the general training would take another under an experienced instructor sent for such purpose. Those then considered eligible would be sent for final training to the school in New York.

In the absence of precedent for guidance, it had been deemed wise in the course of instruction to standardize the methods of x ray men of considerable experience in general x ray work. With the present established curriculum it was believed that a sufficient number of men could be prepared for the x ray work of the war. Major James T. Case who was in charge of x ray work with the American expeditionary forces, it was said, would be in conference with the instructors in this country that the methods adopted might be made applicable to conditions at the front. The work of instruction would now also be greatly facilitated by the publication of the *Manual of X Ray Work*. It had been found necessary to train, in addition to the medical men, those engaged in the purely technical part of the work. For this duty men had been drawn from the enlisted personnel of the Medical Department and given a course of training at the Army Medical School in Washington. Men with factory experience to do the work of installation and repair of highly specialized apparatus had been commissioned in the Sanitary Corps. An important addition in the perfection and standardization of apparatus was said to be the "bedside unit" for the x ray examination without removal of the patient from the bed. This was particularly applicable in fractures of the hip, thigh, and chest. This unit had been developed by Major J. S. Scheerer, S. C., professor of physics at Cornell University, who is now at the head of the teaching force at the School for Instruction in Military Röntgenology in New York City. A special radiator type of Coolidge tube developed by Doctor Coolidge for use with the army portable apparatus had been made use of by Major Scheerer for the bedside unit. The necessity for a readily portable and reliable x ray apparatus had been met by Doctor Coolidge, a description of which outfit was to be published shortly by him. Other developments in accessory apparatus included the construction of a table, the top of which is made of "bakelite," a substance made in connection with the construction of aeroplanes; also a stereoscopic fluoroscope, designed by Captain Caldwell. This, Major Christie said, was expected to be one of America's great contributions to the work of the service in the alleviation of the wounded of the war.

MEDICAL NOTES FROM THE FRONT.

Mental Disturbances Following Shock from Explosives.

GENEVA, December 15, 1917.

A few words now as to mental disturbances following shock from modern explosives. These disturbances arise, be it understood, without any external injury. The simple cases consist in temporary mental daze and a false stupor, while clinically the case is one of simple mental confusion and asthenia, which generally runs a short course. In a second series of cases the asthenic confusional state becomes complicated by motor or sensitive nervous disturbances and although the confusional state has a natural and spontaneous tendency toward rapid recovery, the nervous phenomena are far more te-

*Abstract of a paper read at joint meeting of the Philadelphia County Medical Society and Philadelphia Röntgen Ray Society, December 12, 1917.

nacious. Finally, in a third class there are active delirious disturbances, these being exceptionally simple melancholic states without psychosensory phenomena, but ordinarily they are confusional types with hallucinations, with amnesia in cases of recovery, varying from acute hallucinatory mental confusion to hyperacute mental confusion passing through a phase of chronic mental confusion.

Cases of mental confusion have been observed without any emotional basis, but it is admitted that this condition is the result of the mechanism of the phenomena of autointoxication produced by emotional shock. It seems quite logical to look upon the cases under consideration not as predisposed subjects whose cerebral functions have been subjected to a transitory disturbance of emotional origin, or nervous shock, but as pure and simple organic cases. This conception seems justified by the clinical aspect of the patients. For the diagnosis lumbar puncture should be resorted to. It is also an element in prognosis; indications drawn from the nature of the fluid serve in this respect. It may likewise prove to be an active therapeutic resource. Lumbar puncture offers two indicative reactions. The first is a hemorrhagic cerebrospinal fluid, the fluid being rose or yellow colored, which after centrifugation gives rise to a reddish deposit. At other times the fluid is frankly red, maintaining the same color in two or three tubes, and does not coagulate by standing, characteristics which make it impossible to attribute the color to the presence of blood derived from the needle track. The cerebrospinal fluid offers more or less marked traces of albumin and escapes through the needle in a continuous jet instead of coming away drop by drop. The presence of albumin in the cerebrospinal fluid is analogous to its presence in the urine, because it would seem to be the index of an organic lesion of the cerebrospinal apparatus.

Exploratory puncture must be done quickly, because the changes in the fluid are often very fleeting and even when the result is negative, it is wiser to repeat the puncture. Lumbar puncture forms the basis of an organic examination, because by the positive or negative results obtained the patients can be separated from simple emotional cases, simulators, or exaggerators. That there have been instances of stupor of simple emotional origin seems quite plausible and considering the great number of men who have been exposed to shell explosion predisposed men may very well develop psychic disturbances from a merely emotional shock. All these persons are nervous and impressionable, while some are even constitutional neurasthenics, psychopaths, or old psychasthenics who have been reduced to a paroxysmal state by the emotions of war. These subjects are wounded in the true sense of the word, since a lesion of the nervous system is produced by an organic traumatism. The absence of any external lesion shows beyond all doubt that there has been no direct shock by an exploding projectile or that the subject has been thrown down, so that alone the commotion produced by the explosion can be considered the only etiological factor in these cases.

The initial causative factor is unquestionably the

sudden change in the atmospheric pressure resulting from the explosion of the missile and this can create hemorrhagic lesions as well as fascicular and cell lesions. Now when one is within short range of an exploding shell a real "air shock" is felt, as if the gas molecules strike the body like so many accessory projectiles. Whether or not a shock to the nervous system occurs by the intermediary of the organs of sense, particularly the auditive, is questionable and what is more probable is that the increase of the atmospheric pressure, followed by rarefaction, produce vascular or cell disturbances. During bombarding with shells anaeroid barometers in the perimeter of the explosions suddenly cease to record, although the instrument is free from any apparent external shock. Therefore, in certain cases there is a single traumatic factor, no matter what may be its pathogenesis, which should differentiate these cases from those in which there is simply an emotional shock. The fact that there are mixed cases must not be overlooked.

CHARLES GREENE CUMSTON.

MEDICAL NEWS FROM WASHINGTON.

Increase in Sick Rate More Apparent Than Real.—Emotional Control Tests for Aviators.—Value of Finger Prints Demonstrated.—Medical and Dental Students Enrolled in Naval Hospital Reserve Corps.—Board Revising Regulations for Physical Examination of Applicants.—Nutritional Survey of All Army Camps and Stations.—Captain Carlson to Confer with Canadian Authorities.

WASHINGTON, January 21, 1918.

Late reports reaching the office of the surgeon general of the army show a greater number of men under treatment, but this increase in the sick rate is more apparent than real, for the reason that, with more hospital accommodations becoming available at the camps and cantonments, patients are kept longer under treatment. Although the pneumonia rate continues comparatively high, the disease is more widely distributed, and there are no epidemics of the disease at any one camp at present, except at Camp Travis, San Antonio, Tex., where, as is usually the case, pneumonia is prevalent as an aftermath of an epidemic of measles. Generally, the situation as to measles is better, and there also is a decrease in the number of cases of meningitis. Disease conditions continue to be less satisfactory at camps where southern troops are assembled than at those having men drawn from the northern States.

* * * * *

Considerable highly scientific study lately has been applied by army and navy medical officers to tests of those engaged in aviation duty. There has been a difference of expert opinion as to the detailed character of these examinations, but gradually, after much discussion and experience, a system has been adopted that is believed to determine individual fitness in a satisfactory manner. In flying the human body is pursuing such an unusual occupation in such an unusual environ-

ment that ordinary methods of examination are inadequate to determine fitness for such service. Moreover, flying being a comparatively new science, new experiences are bound to accumulate, which in all probability will produce many future changes in the present proposed method of physical examination. Many of the eye and ear tests used are of German and Austrian origin. What these countries have done along this line since the war is not known here, but it is known that their flying corps personnel is selected very carefully. For this reason, if for no other, it is necessary for us to meet this condition by equal care in the selection of our men for aviation duty. Surgeon R. A. Bachman, of the navy, is among those that have devoted much time and thought to the subject, and he has reached some conclusions that are important, although too voluminous to be reported in detail. In addition to some extraordinarily severe tests of ear determination, equilibrium, vision, and muscle balance, there is a somewhat mysterious factor in the form of a psychological test. In this connection, Dr. Bachman says: "It seems to be desirable that some form of tests be made to determine judgment and emotional control in the applicant. As for the latter, it would appear to be reasonable that this testing could best be made during the stage of apprenticeship the flyer undergoes. The various emotional disturbances which the beginner experiences react on him considerably and the teacher usually becomes quickly cognizant of them. Those who show inaptitude in this respect should be weeded out at the aviation camps. A medical officer's supervision is always at hand at every flying camp, and he could be utilized to assist the instructor in making observations. At present the method employed of producing a sudden shock, such as shooting a pistol or creating some other loud noise suddenly behind the unsuspecting candidate, does not meet the requirements. To establish the presence of normal judgment in a candidate is not easy, yet very necessary. Judgment of distance, time, and speed enter considerably into flying in all its phases."

* * * * *

A case of aphasia, which emphasized in a striking manner the value of the finger print system as a means of identification, recently occurred at Washington. A man in bluejacket's uniform was left at the naval hospital in that city, about 9 o'clock one evening, by a lady in a limousine. The only information she could give regarding the man was that she had noticed him in a dazed condition on the street, and, believing him to be in distress, took him into her machine and brought him to the hospital. Medical Director Robert M. Kennedy, commanding the hospital, was unable to obtain any information from the man himself as to his identity or where he belonged. Finally, one of the finger print experts of the Navy Department was called in, the man's finger prints were taken, and almost immediately he was identified as to name, station, place of enlistment, etc. It was shown that he enlisted in Michigan last May and disappeared from the naval training station at Great Lakes, Ill., in October. He was unconscious for fourteen

hours after arrival at the hospital, and he was under treatment for several weeks without apparently recovering any knowledge as to his identity.

* * * * *

About 1,000 medical and dental students were enrolled in the Naval Hospital Reserve Corps during the week ending December 15th, when the new selective draft regulations went into effect. These young men, of whom about two thirds are medical students and one third dental students, were enrolled as hospital apprentices, first class, in an inactive status, and permitted to continue their studies. It is planned to assign them to duty during their vacation period where they will acquire practical knowledge and experience. The enrollment of this large class of students solves, for the present at least, the problem of supplying the navy with available material for medical and dental officers. Under the new draft regulations, they could only be exempted provided they enrolled in the medical branches of the army or navy, and consequently those students that preferred service in the navy took advantage of the opportunity of enrolling in the Naval Hospital Reserve Corps before it was too late.

* * * * *

A board of officers has been in session at Washington for the purpose of revising the regulations for the physical examination of applicants for enlistment in the army and registrants under the selective draft regulations. The main purpose of the revision is to make more specific and clear those portions of the regulations that appear to have been misunderstood or misinterpreted by the local medical examiners during the progress of examination of registrants called on the first draft. It is not the intention to make any material changes in the requirements. The board consists of Colonel George E. Bushnell, Medical Corps, retired; Lieutenant Colonels Thomas L. Rhoads and Philip W. Huntington, Medical Corps; Majors Pearce Bailey, Joseph C. Bloodgood, Elliot G. Brackett, William H. G. Logan, Warfield T. Longcope, Walter R. Parker, and Charles W. Richardson, Medical Reserve Corps, and Contract Surgeon Henry H. Morton, with Contract Surgeon William A. Pusey as alternates.

* * * * *

The nutritional survey of the various army camps and stations is being conducted as rapidly as practicable, and in this connection attention is being given, for comparative purposes, to the food conditions among the Canadian forces. Captain Anton J. Carlson, of the Sanitary Corps, attached to the Army Medical School at Washington, has been directed to proceed to Ottawa for the purpose of conferring with the surgeon general of the Canadian forces concerning nutrition in the Canadian army, and thence to go to Montreal and Toronto for the purpose of observing the food conditions at the concentration camps at those places. He will then conduct preliminary nutritional surveys at the aviation camps at Mount Clemens, Mich.; Rantoul, Ill.; and Fairfield, Ohio; after which he will return to his station at Washington.

Editorial Notes and Comments

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A CENTURY OF SERVICE.

The one hundredth annual report of the Surgeon General of the United States Army, which has only recently appeared, covers the calendar year of 1916 with a financial statement for the fiscal year 1916-1917. This is the one hundredth consecutive annual report of the Surgeon General, the first having been compiled in the year 1818. The century covered by the hundred reports has been a period of remarkable scientific and professional advance in medicine, and the army of the United States has played a not inconsiderable part in that advance. Among the most conspicuous of the services rendered by the Medical Department of the army have been the organization of a transport service for the wounded by Surgeon General Lettermann during the Civil War and the study of the etiology of yellow fever and of malarial fever.

The transport service for the wounded in all the armies of the civilized world is modelled on the plan first laid out by Lettermann. While the honor of first recognizing the causative relation of the stegomyia to yellow fever is due a Cuban, Doctor

Finlay, and that of recognizing the relation of anopheles to malaria is due to an Englishman, Sir Donald Ross, the practical studies of their theories by the United States Army officers were most important factors in establishing the theories on a sound basis and in pointing out the practical utilization of this knowledge.

Since the report covers only the calendar year of 1916, it does not discuss the great work going on in the present war. There is merely a brief reference to it in the introductory portion of the report. From this it will be interesting to learn that the Surgeon General believes that at least 24,000 physicians will be included in the personnel of the Medical Department of the army when its full strength is attained. In preparing for the great task imposed upon the Medical Department the Surgeon General says that he has received the earnest and whole hearted support of the entire medical profession of the United States and that the most distinguished specialists in all branches of medical endeavor have enrolled as members of the Council of National Defense and as commissioned officers of the Medical Reserve Corps and are there rendering a service to the army and to the country which cannot be over-estimated and which will ever be held in grateful remembrance.

The immensity of the task which devolves upon the Surgeon General is difficult to realize. He will be called upon not only to provide for the physical and mental examination of the millions of recruits who will be called to arms, but must supervise the water supplies, inspect the foods, and direct the disposition of waste, the sanitation of camps and cantonments, the care of the sick and the wounded, the preparation and operation of hospitals, the re-education of the permanently crippled, and the purchase and distribution of the necessary supplies for all this work. A perusal of the report shows that the problems to be confronted are clearly discerned and that intelligent forethought has been exercised in preparing to meet them. In reference to pneumonia—this report, it must be borne in mind, is for 1916—the following statement is made: "It has been demonstrated that if camps are maintained during the winter months epidemic lobar pneumonia must be given serious consideration by the military sanitarians, a fact recently shown not only by our own experience but also by the reports from the armies abroad. . . . We must now give renewed and most extraordinary attention to our precautions against 'this greatest of all the captains of

the men of death." In view of the epidemics which have appeared in several of the camps since the above paragraph was written, it will be seen that the Medical Department was certainly not taken unawares by this disease.

Probably the most interesting and informing portion of the report is presented in the special reports from the chief surgeon of the expeditionary forces which entered Mexico in March, 1916, for these papers furnish the first reports from American surgeons with American troops under active service conditions since the close of the Philippine campaign.

The statistical features of the work are of interest as showing the size of the Medical Corps just before the war. On June 30, 1917, there were in service 489 medical officers of the regular army, thirty-nine candidates for the Medical Corps approved and awaiting confirmation, 3,636 medical reserve officers on active duty, eighty-six dental surgeons, fifty-seven commissioned veterinarians, 259 army nurses, 917 members of the Army Nurse Reserve Corps on active duty, an enlisted personnel of 16,773, and 934 civilian employees, making a total medical personnel of 23,199. In comparison with this we now have about 16,000 medical officers and 160,000 enlisted personnel, an increase which imposes a very severe strain upon the capacity of the regular army Medical Corps for absorbing and amalgamating the new material which has been brought into the department through the exigencies of war.

EXTERNAL INTERFERENCE WITH THE COLON.

Among the wise sayings of mankind it is asserted that even the patient worm will turn. What then of the long suffering colon upon which contumely is heaped, toward which suspicion and distrust are directed, and which is made the object of medication, manipulation, and threat of annihilation by surgery, all of which would have long ago discouraged a more sensitively attuned organ to utter inactivity and loss of functions? Yet this patient and humble termination of the intestinal tract "works while you sleep" and performs its office of eliminating waste from the body, when it is permitted unhindered to do so.

Contumely comes from those who look upon it as something scarcely to be tolerated, as the mere "body sewer," not only carrying but hoarding putrefying matter sufficient unto all bodily ills. This leads to the distrust and fear with which it is viewed and its functioning is watched and morbidly speculated

upon by physician and patient alike, who plot and carry out in petty ways or with more serious tampering a system of interference under which the stoutest function must with difficulty maintain itself. It is forgotten that the colon is but a part of an intestinal tract perfected during the course of evolution for a definite purpose expressed in the increasing needs of an organism. This organism has adapted itself to an intake of environment in the form of food and the release again into the environment of those portions from which the organism has extracted whatever is of value. Two very important things have been overlooked in the medical and the popular mind. One is the perfection of functioning which unhindered adaptation brings to pass in the bodily organism, always, to be sure, with possibilities of improvement in the growing complexity and refinement both of the organism and of the environment. A simpler conception of these organs of the body would see in them their purpose and their adaptation to that. External stimulus applied to them approaches at cross purposes, not in the direction of that which their function accomplishes. Any real assistance or stimulus must come from within, along the path of the function to be performed and within the very nature of the organ itself.

The x ray presents testimony to this from the colon itself. Franklin W. White offers a brief report of *Some Effects of Massage on the Colon* [*Boston Medical and Surgical Journal*, January 10, 1918] as testified by the x rays, which goes to prove the doubtful utility of massage and even its possible ill effect under some conditions. The good accomplished is due to a certain amount of stimulus given to the reflex mechanism, added to the possible benefit of mashing up of the contents, therefore referring whatever benefit there is back almost exclusively to internal functional activity. Even this is small compared with the effect of the more normal process of taking food.

The second factor which is left out of consideration to a very great extent is the factor of psychical influence. After all the colon, like every organ of the complex human body, is only another part of the mechanism at the control and disposal of the energy and purpose of life. Here so many factors enter through a widely differing and a constantly shifting evaluation of purposes and means that confusion arises. Sometimes function is stimulated and aroused; at other times mischief is wrought. There are subtle undercurrents of psychic interest preserved from days of simpler infantile activity and through kindred interests of adult life, which give the colon its special value and at the same time

set up a psychic concern which overvalues it and then in turn sets a ban upon it. This lies for the most part deeper than conscious thought. This makes it psychically susceptible to suggestive influences and so increases the power of the distorted opinions held concerning it; in fact is responsible for their origin. It gives also a questionable reputation to the slight functional effect of massage or other manipulation, for they refer again surreptitiously to the colon in its function as an object of infantile interest and attention which savor more of magic and pleasurable phantasy than of the scientific reality in which it does its work. Surplus of attention therefore tends to derange the smoothest automatic functioning and brings again into a phantastic prominence this portion of the body which, uninterfered with and left to itself, would accomplish a more perfect service to the organism than any amount of artificial aid could ever introduce.

AMUSIA AND THE LOCALIZATION OF THE MUSICAL CENTRES.

It is at present known from a number of recorded cases, some with autopsy, that the musical faculty is not united with the faculty of speech and that even voluntary singing is not connected with spontaneous speech. Musical comprehension and singing may be preserved when speech has been absolutely abolished. It is not simply from the clinical viewpoint that there is a separation between the two faculties; the musical faculty must of necessity possess its own centre.

It may be admitted with some certainty that the musical faculty is situated in the left hemisphere and that its sensory centre is to be looked for in the anterior two thirds of the first left temporal convolution and in the anterior half of the second, that is to say, in Wernicke's centre. The motor centre of singing is probably situated in the second frontal convolution, while that of music reading is in the left parietal lobe. The centres of musical movement, which govern execution or interpretation upon various instruments, appear to develop in direct relation to the progress made by practice in the ascending parietal convolution beside the motor centre of music writing. Finally, another motor musical centre for wind instruments develops in the area governing the movements of the lips, which is situated slightly above Krause's centre, the singing centre.

Following the same train of thought it is also to be admitted that centres of musical images exist, likewise of musical conception and thought. The centre of musical memory is behind the tonic centres,

in the area of Flechsig's posterior associated centres, while the centres of musical conception and thought reside in the frontal lobes, in the area of Flechsig's anterior associated centres. Each of these centres may be involved separately. Since there exists in the brain a small tonic centre corresponding to each tone or to a tonic ladder for the ensemble of tones, it is evident that a complete or partial tonic deafness may exist, as has been pointed out by Bezold. It is likewise to be assumed that the musical centres are in relation with Krause's motor centre of the larynx, as is also observed in the connection of Wernicke's centre with Broca's motor centre of speech.

The independence of the disturbances of the musical faculty is demonstrated both clinically and by pathological findings and from the data so far obtained it is clear that the seat of the lesions in cases of amusia are almost always seated in the anterior portion of the first and second left temporal convolution for sensory amusia, in the second left frontal convolution for the motor variety, and in the left parietal lobe for music reading.

MALARIA CONTROL.

Two highly endemic localities in southeastern Kansas were chosen for the institution of control measures in a study of malaria control by R. C. Derivaux, H. A. Taylor, and T. D. Haas (*Public Health Bulletin* No. 88, September, 1917). A town unit was studied in which antimosquito measures alone were employed, and a rural unit was chosen in which each family or house received individual consideration, being protected by proper screening or by the administration of quinine in immunizing doses, supplemented by the sterilization treatment of proved carriers upon detection by blood examination. In Crossett, a lumber town of about 2,000 inhabitants, the antimosquito measures instituted were clearing, drainage, filling in of streams, and the employment of oils and larvicides. The immediate results were the almost total absence of mosquitoes, which was later followed by a progressive diminution in the incidence of malaria. Repeated parasite indices showed a reduction of 77.33 per cent. and there was a reduction of the total visits for malaria, as compared with the preceding year, of 70.39 per cent., while for the active season, June to December, there was a reduction of visits of 82.07 per cent., as compared with the previous year. The total costs of the control measures were \$2,506.40, a per capita cost of \$1.235, and since much of the first work is permanent, its continuation should cost substantially less.

For the second part of the experiment, plantations around Lake Village, Chicot County, were chosen. Thirty-three houses were screened at an average cost of \$14.77. The occupants were carefully observed and all the known carriers were given quinine for sterilization.

Repeated parasite indices showed a reduction of 70.6 per cent. among 142 persons, and as the screening should last for two years, the cost for each family is estimated at \$7.385, or \$1.75 per capita. In a second series, 237 persons were given quinine for immunization, and repeated malaria indices showed a reduction of 64.45 per cent. The per capita cost for quinine was \$0.57. Sixty-nine carriers were given quinine for sterilization; of these, sixty-two remained under observation and were available for reexamination. Of this number, three were still infected, giving a reduction or "sterilization rate" of 95.17 per cent. A negative group of 120 persons averaged a loss of \$11.21 a family, or \$2.52 per capita, whereas among the groups under control the family loss averaged \$0.23, and the per capita loss was \$0.06.

REHABILITATION OF THE WOUNDED.

One of the grave problems which will confront the United States, as it now confronts the other nations at war, will be the rehabilitation and the re-education of the wounded. We are fortunate in having before us the experience of Great Britain and France. By a careful study of this experience we may be able to profit materially both in the effectiveness of the work done and in the adequacy of preparation for it. An interesting study of what France has done in this direction appeared in a recent issue of the *British Institute of Social Service* and those interested in the solution of this difficult task should study this important contribution, which appears in Vol. xii, No. 1. Many public institutions are engaged in this work and a number of private institutions have been subsidized by the Government. A ministerial commission was formed to study the question in all its aspects, to settle the principles upon which the work should be conducted, and to appropriate parliamentary funds. The responsibility for the coordination of the work in connection with mutilated soldiers has been placed on a commission composed of the minister of labor, the under secretary of state for war, and the director of public assistance and hygiene, and the work done has been most satisfactory both as to its economic and its moral effect. The Surgeon General of the United States Army has appointed a commission of orthopedic surgeons under the direction of Major E. G. Brackett, M. R. C. of Harvard University, which is perfecting elaborate plans for carrying on this work for the soldiers of the United States along lines somewhat similar to those followed in France, and one institution has already been established in New York under an endowment of Mr. Jeremiah Milbank for the training of disabled soldiers.

MENINGITIS IN THE NAVY.

Dr. C. P. Kindleberger, Medical Inspector, U. S. Navy, presents in the *United States Naval Medical Bulletin* for January, 1918, a most interesting report on the epidemic of cerebrospinal fever, which occurred in the Atlantic Fleet between March 25th and

August 7th. Altogether 118 cases were reported with twenty-four deaths. The patients were almost all very young, most of them being under twenty, though one was forty-one years of age, one was thirty, several were between thirty and twenty. No specific conditions could be found to explain the prevalence of the disease aside from its general prevalence in epidemic form throughout the United States and the rapid recruiting incident to the outbreak of the war which necessitated the transfer of recruits without the usual period of detention and weeding out the physically unfit. As soon as the outbreak occurred, sanitary regulations were promulgated and strictly enforced involving the transfer of suspected or actual cases of contagious diseases to hospitals or hospital ships, the thorough disinfection of all recruits and their clothing and of the decks, and the keeping of the recruits in the open air as much as possible. Attempts to detect carriers by staining smears from the nose and throat proved futile, as was expected, since it is generally accepted as true that carriers of meningococci can only be detected by cultural methods. The author revives the suggestion that an effort be made to eliminate the physically and mentally unfit by enlisting the aid of a number of patriotic specialists in every recruiting district to help weed out undesirable. In the army this has been done to a certain extent by the organization of special boards, for instance, whose members act as contract surgeons and pass upon all cases of recruits whose examination leaves the examiner in the least doubt as to his acceptability. If the naval regulations permit, it would seem that some similar provision might be made for cooperation between the naval officers and civilian specialists.

Obituary

WILLIAM HANNA THOMSON, M. D.,
of New York.

Dr. William Hanna Thomson, president of the New York Academy of Medicine in 1890-1900, died on Friday, January 18th, at his home, 71 Central Park West, in his eighty-first year. Doctor Thomson was born in Beirut, Syria, where his father was a missionary. He took his A. B. degree from Wabash College in 1850, A. M. in 1857, and M. D. from Albany Medical College in 1859. Yale conferred an honorary degree of master of arts upon him in 1861 and doctor of laws was conferred upon him by New York University in 1885. In 1859 he was appointed assistant physician to the Quarantine Hospital and served as United States medical inspector throughout the Civil War. Doctor Thomson was professor of medicine at New York University Medical College, and was attending physician at Bellevue, Roosevelt, and Ward's Island hospitals. He was a member of the Association of American Physicians, a fellow of the Academy of Medicine, the Harvey Society, and the Neurological Society, and was the author of *Life, Death, and Immortality* and *Brains and Personality*.

News Items.

To Enlarge Naval Hospitals.—Plans for enlarging naval hospitals at Norfolk, Va.; Great Lakes, Ill., and those at the American naval bases in Great Britain and France have been completed by Surgeon General Braisted. The foreign hospitals are to be doubled—that in England to 1,000 beds and that in France to 500. The capacity will be based on a sick rate of five per cent.

Meetings of Medical Societies to Be Held in New York During the Coming Week.—Monday, January 28th, Medical Society of the County of New York; Friday, February 1st, New York Academy of Medicine (Section in Surgery), New Utrecht Medical Society, New York Microscopical Society, Gynecological Society, Brooklyn Practitioners' Society of New York, Society for Serology and Hematology, New York (annual), Alumni Association of Roosevelt Hospital; Saturday February 2d, Benjamin Rush Medical Society, New York.

Intensive Training of War Nurses at Vassar.—A school for the intensive training of war nurses, patterned after officers' training camps, will be organized at Vassar College during the summer months. The plan has been indorsed by the National Emergency Nursing Committee, and the American Red Cross has promised \$75,000 to finance the first sessions of the school. The plan calls for a training course of three months and will not interfere with the regular courses of the college. Instruction is to be given under the direction of a staff of well known women medical experts.

War Medals Awarded by the Social Service Institute. Gold medals have been awarded by the National Institute of Social Sciences to Dr. William J. Mayo, of Rochester, Minn.; Henry P. Davidson, chairman of the War Council of the American Red Cross Society, and Herbert C. Hoover, United States Food Administrator, in recognition of their humanitarian work. Presentation medals for valuable service in their fields of work were awarded to Francis G. Benedict, Sc. D.; Leo S. Rowe, LL. D.; John A. Kingsbury, formerly Commissioner of Charities of New York; Dr. Thomas W. Salmon and Professor C. E. Winslow. Professor Irving Fisher, of Yale University, presented the medals.

A Base Hospital in Northern Manhattan.—The property at the north end of Manhattan Island recently purchased by the Rockefellerers from C. K. G. Billings and others for a public park has been taken over by the United States Government as the site for a base hospital. Within a few days the Amsterdam Building Company will begin to erect \$500,000 worth of temporary buildings, which, with Tryon Hall, former home of Mr. Billings, will house the equipment and patients. The former Billings residence will also be remodeled to suit the requirements of a hospital. The site which the government has taken over was sold to John D. Rockefeller and his son for about \$2,000,000. It comprises fifty-seven acres of land—the Billings, Hays, and Schaefer estates. A short time ago officers of the Medical Corps inspected the property and pronounced it ideal as the site for a base hospital, where soldiers seriously wounded in France could be cared for. The hospital will be built upon one of the most desirable sites in the city.

The Children's Medical Division of Bellevue Hospital.—This division has been reorganized during the last eighteen months, and is ready to offer to graduates in medicine an opportunity to do work in the wards and the outpatient department. This service is the largest children's service in the city, having about 125 ward beds, and an average daily attendance in the outpatient department of 75 to 100. The latter department is being conducted on a new plan. The patients are divided into classes as far as possible so as to facilitate the study of different conditions. There are under observation in the cardiac class about 200, in the malnutrition class 200, in the infant feeding class over 1,000. Besides these, special classes are held for syphilis, enuresis, mental defects, chronic bronchitis, eczema, and tuberculosis suspects. No formal teaching is offered, but an opportunity is given to make rounds and study patients in the wards with the house and attending staffs, and to work in the outpatient department under the direction of the attending staff. Any physicians desiring to do this work may apply at the hospital or to the director of the service by mail.

Social Science Institute Adopts Resolution.—At the annual meeting of the National Institute of Social Sciences, held at the Hotel Astor on Friday, January 18th, the following resolution was adopted:

Resolved, That the President of the United States be urged to institute adequate measures for the conservation of the health and the promotion of the physical efficiency of the nation during the period of the war.

Meetings of Medical Societies to Be Held in Philadelphia During the Coming Week.—Monday, January 28th, Section in General Medicine of the College of Physicians, North Branch of the County Medical Society; Tuesday, January 29th, Medical College Society, Academy of Stomatology; Friday, February 1st, Kensington Branch of the County Medical Society, Physicians' Motor Club (directors).

Northern Medical Association of Philadelphia.—At the annual meeting of this association, held in Philadelphia recently, the following officers were elected to serve for the ensuing year: President, Dr. George W. Sholler; vice-president, Dr. Irwin S. Meyerhoff; secretary, Dr. Mulford K. Fisher; treasurer, Dr. John W. Millick; corresponding secretary, Dr. Howard D. Geisler; censor, Dr. Henry C. Paist; librarian, Dr. William R. Bready, Jr.

Civil Service Examinations.—Among the positions for which the Civil Service of the State of New York will hold examinations on February 23d are the following: Medical adviser, Division of State Insurance Fund, State Industrial Commission, open to men only; resident physician, State Agricultural and Industrial School, Monroe County; assistant physician, regular or homeopathic, in State hospitals, open to both men and women. For further particulars address the State Civil Service Commission, Albany, N. Y.

A Symposium on Goitre.—At a stated meeting of the Philadelphia County Medical Society, held Wednesday evening, January 23d, the program consisted of a symposium on goitre. Various phases of the subject were presented as follows: The Pathology, by Dr. A. G. Ellis; The Viewpoint of the Internist, by Dr. James M. Anders; The Heart in Exophthalmic Goitre, by Dr. Hobart Amory Hare; The Nonsurgical Treatment of Goitre and Its Complications, by Dr. Charles E. de M. Sajous; The Surgical Treatment, by Dr. Charles H. Frazier. The discussion was opened by Dr. William Egbert Robertson, Dr. Theodore H. Weisenberg, and Dr. Charles Scott Miller.

Medical Society of the County of New York.—A stated meeting of the society will be held in Hosack Hall, New York Academy of Medicine, Monday evening, January 28th. The following program will be presented: Official business and the inaugural address of the president, Dr. Howard Canning Taylor; papers as follows: Recruiting of the Medical Reserve Office, by Dr. Frederick T. Van Beuren; Surgical Training at Bellevue Hospital, by Dr. John A. Hartwell; General Training at Fort Benjamin Harrison, by Dr. Watson Lawrence; Training in the Neurological School of New York, by Dr. Charles A. Elsberg; Training in Plastic Surgery of the Face, by Dr. Robert T. Frank. The resolution introduced at the November meeting by Dr. John P. Davin concerning the new narcotic regulations will be discussed.

The Prevention of Tuberculosis in the Army.—The National Association for the Prevention of Tuberculosis, working in cooperation with the Surgeon General of the Army, the Y. M. C. A., and other agencies, has perfected plans for a military antituberculosis campaign. In accordance with present arrangements the name of every man discharged on account of tuberculosis will be obtained from division surgeons at training camps and these names will be sent to the various State organizations and health boards for follow up work. The association is also co-operating with the Surgeon General to aid the government in providing the necessary tuberculosis sanatoria. The educational features of the campaign include the furnishing of a number of stock lectures on tuberculosis, with lantern slides to illustrate them. The desirability of appointing one or more special officers detailed to lecture on tuberculosis and allied health topics in all army camps throughout the country has been suggested to the War Department. The association will also send to the camps a number of special tuberculosis exhibits with moving picture films and lantern slides. Dr. H. A. Pattison, medical field secretary of the association, is in charge of the educational work.

Modern Treatment and Preventive Medicine

A Compendium of Therapeutics and Prophylaxis, Original and Adapted

Bismuth Iodoform Paste in Outpatient Work.

Vincent O'Connor and Henry A. Kreutzmann (*Journal A. M. A.*, December 15, 1917) use a paste prepared according to the formula of Morison and an emulsion containing one part of bismuth subcarbonate, two of iodoform, and four of liquid petrolatum. In highly infected wounds they irrigate with sterile saline or four per cent. boric acid, swab thoroughly with seventy-five per cent. alcohol, shave and cleanse the surrounding skin with the alcohol, pack the wound and all its sinuses and pockets tightly with the paste, and close it with silk or silk-worm gut sutures. Most of such wounds heal by first intention under such treatment and leave insignificant scars. Tuberculous cervical adenitis with suppuration responds promptly to curettage followed by alcohol and the bismuth paste. Empyema cavities and lung abscesses also close promptly following their filling with the emulsion and the leaving of the drainage tube in place. No cases of poisoning have so far resulted from such uses of these mixtures. The advantages of their use in outpatient clinics are the rapid promotion of healing, the control of infection, the cheapness, the lack of toxicity, the saving of dressing material, and the reduction in the number of visits required of the patients.

Pericious Anemia.—George R. Minot and Roger I. Lee (*Boston Medical and Surgical Journal*, November 29, 1917) emphasize the point that there is no known treatment which cures pernicious anemia. Reported cures apparently represent either very long remissions or incorrect diagnoses. Yet life can be prolonged and remissions brought about. The first essential for treatment is a correct diagnosis, which is not to be made on the blood smear alone, and is seldom made early. A careful, detailed study of the activity of the bone marrow and red cell destruction is important. Not only one, but all of the three chief elements of the marrow must be studied; the polymorphonuclear neutrophiles, red cells, especially the young ones, and the platelets. He divides the disease into five types, which merge into one another, and notes that those types which do well spontaneously are the ones usually most favorably affected by therapeutics. These types are: 1, cases of an acute nature which progress rapidly to a fatal termination in a few months, the degree of blood destruction varying; 2, cases with marked or fair remissions, usually with considerable hemolysis which is greater in the relapses and may not be abnormal in the remissions; 3, cases which show chronically a considerable degree of hemolysis with relatively slow and not striking remissions, but no very serious relapses except after years or terminally, and which usually have enlarged spleens and are affected more favorably by splenectomy; 4, cases of a chronic nature which slowly progress downward, though interrupted by mild remissions. This type merges directly into 5, cases of a continuous chronic nature that very slowly progress downward with very slight or no remissions asso-

ciated with little increased red cell destruction and a sluggish, inactive marrow. Older patients are more apt to have a less relapsing and less hemolytic type of the disease than younger ones. Cases with enlarged spleens, together with somewhat enlarged livers, when these enlargements are associated with and probably due to hemolytic activity, are apt either to have, or to have had, a more favorable course, than those without such enlargements. General treatment, rest in bed, freedom from mental worry and strain, fresh air, sunlight, and good hygiene are important and are to be combined with any other treatment employed, as well as with a suitable diet and treatment directed towards achlorhydria or cardiac weakness. Oral septic foci should be removed, but just how far one should go in removing possible septic foci in such internal organs as the gallbladder and appendix is still open to question. The use of arsenic by mouth in various forms, preferably as Fowler's solution, has for some time been the chief special treatment, and it has recently been used intramuscularly and intravenously, but the writers are uncertain whether it is of benefit or not. They say that it does not seem to cause any very marked stimulation of the bone marrow, but as it seems to do no harm, and as there is a prevalent idea that it is helpful, it may be well to use it in combination with other therapy. The use of cholesterin, extracts of marrow, glycerin, hemolysins, serums, thyroid extracts, etc., is mentioned as having been tried with varying success. Procedures to cause increased oxygen want, which stimulates the bone marrow, have been recently used, and may in the future have a definite place in the therapy of this disease. Much more attention is devoted to transfusion and splenectomy, which offers the best means for inducing remissions, though a spontaneous remission may be as marked as one inaugurated by these procedures. No case is too sick for transfusion, which can give symptomatic benefit rapidly, and may also cause stimulation of the marrow, or allow of its increased activity. The amount of blood most desirable to transfuse is not settled. Some advocate from 1,000 to 1,500 c. c.; others from 100 to 200 c. c. The writers have usually transfused about 600 c. c., but have advised at times larger, and at times smaller quantities. When there is a low red count and low hemoglobin it is often necessary to give massive transfusions, as well as when it is done to check hemorrhage, but large transfusions may be harmful in some ways. The ideal may be to give small amounts repeatedly and often at a time when the blood elements are not extremely low, but this may be impractical, so from 450 to 700 c. c. is recommended. The donor should be healthy, with negative Wassermann, one whose red cells are not agglutinated by the patient's serum, and preferably one whose serum does not agglutinate the patient's cells. Isohemolytic reactions will not occur with properly selected donors, but less severe reactions of unknown nature cannot at present be avoided.

Splenectomy is reserved for selected cases of pernicious anemia, and is a palliative operation. It checks the red cell destruction and increases the activity of the marrow, and is followed by good remissions more consistently and uniformly than other forms of treatment. The cases that approach the disease hemolytic jaundice are the most suitable ones for the operation. The writers believe that by means of transfusion and splenectomy the patients do better and can be made more comfortable while they live, and sometimes may be made to live longer. Probably the best ultimate results will be seen when transfusions are begun relatively early, so that the patients never remain very anemic for long periods. Röntgen ray exposures of the spleen have at present shown no definite beneficial effect.

Chronic Bright's Disease.—J. M. Anders (*Dominion Medical Monthly*, December, 1917) points out that the two guides in the treatment of chronic Bright's disease are: 1, the general condition of the patient, which is influenced by the progress of the affection; and, 2, the rate of metabolic excretion as determined by modern methods of examination. The amount of urea excreted in twenty-four hours is an indication of the outcome of the case and should be carefully and repeatedly estimated. Creatinin is excreted with great difficulty by a diseased kidney. If over five mgm. in 100 c. c. of blood were present the cases invariably terminated fatally in from a few days to a few months, while figures from three to 3.5 mgm. are decidedly unfavorable. Extremes of mental and bodily activity are to be avoided. Primary foci of infection in the teeth and tonsils should receive attention. A warm, dry, and mild climate is the best. In cases not showing any marked degree of edema considerable water should be allowed. When dropsy exists the intake should not exceed a litre per diem. In these cases a salt free or a salt poor diet should be administered. Care should be observed in putting patients on a milk diet because of the high protein content of milk. In prescribing drugs for this condition saline cathartics have proved of value. Mercury should never be used and irritating diuretics such as caffeine, theocin, sodium acetate, and other members of the purin group, should also be avoided. Digitalis and the salts of potassium, especially the citrate, should take their places. The Karrell diet, which consists in giving the patients 200 c. c. of raw or boiled milk four times daily, at 8 a. m., 12, 4, and 8 p. m., and nothing else, is warmly advocated by some. It should be kept up for a week, after which time it may be gradually relaxed. The diastolic blood pressure is of more value than the systolic and when high, measures should be taken to reduce it. Increasing doses of nitroglycerin, beginning with one minim every three hours, should be given. Myocardial exhaustion requires digitalis and, if the peripheral tension is high, nitroglycerin may be combined with it. If uremic symptoms develop, starvation for two or three days is advisable, as is also venesection followed by the use of salt solution given subcutaneously, from 500 to 1,000 c. c. Inhalation of chloroform or morphine by hypodermic, 1/6 to 0.25 grain may be administered. Chloral in 0.5 dram doses

per rectum has also proved of value. Kidney organotherapy has not been in vogue sufficiently long to appreciate its value. The tablet known as nephretin has been employed, the dose being from ten to fifteen five grain tablets daily, preferably taken between meals. The effects of kidney preparations are: 1, the prevention of uremia; 2, a reduction in the percentage of albumin; 3, increased diuresis. The number of cases in which surgical treatment is of value is very small and this procedure has been most valuable in cases of hematuria.

Tendon Operations for Gunshot Injuries of the Hand.—Leo Mayer (*Journal A. M. A.*, December 22, 1917) describes his methods for restoration of function after injury to the tendons of the fingers. For injury to a pair of flexor tendons the flexor sublimis tendon of the next finger is freed, cut, and drawn through a deep channel to be joined to the stump of the severed profundus tendon. Where an extensor tendon is injured it is repaired in a similar way by anastomosis with the freed tendon of the extensor communis digitorum of the index finger. This can be done only when the tendon of the extensor indicis proprius is uninjured. Two methods of tendon suture are available, the one a buttonholing of the stump of the injured tendon with passage through it of the new tendon followed by suture; the other an end to end suture by a Lange stitch followed by covering the site of union with a fascial cuff taken from above the ankle. Aftertreatment is important and includes the use of supporting splints and the institution of mild voluntary movements beginning two weeks after the operation and being very gradually increased. The results have shown, at best, a seventy-five per cent. restoration of the function.

Prophylaxis in Cerebrospinal Syphilis.—B. C. Corbus (*Journal A. M. A.*, December 22, 1917) emphasizes, in agreement with Ogilvie, that the important point in the treatment of all of the forms of cerebrospinal syphilis is that of prevention, or, if this has not been accomplished the earliest recognition of cerebrospinal involvement followed by prompt and intensive treatment. Attention is especially directed to the fact that cerebrospinal involvement may be present along with a negative blood serum Wassermann reaction. In all cases of syphilis or suspected syphilis, the spinal fluid should be examined for cells, globulin, and the gold and Wassermann reactions. It is a mistake to attempt direct intraspinal treatment in cases of secondary, tertiary, or latent syphilis, or even early tabes. Instead there should be intensive systemic treatment. Five intravenous doses of salvarsan, or one of the newer preparations, should be given during two weeks. The blood is then tested for arsenic by the Abelin test and if it is present a lumbar puncture with the removal of twenty to thirty mls of fluid is made an hour following the fifth injection. About ten days later a course of three to four months of intensive treatment by mercury inunction is begun. Then the salvarsan treatment is repeated and the spinal fluid examined to see if it has undergone any changes indicative of improvement. After the fluid has become negative the same plan of treatment should be continued for a full year.

Skin Diseases and Their Treatment Under War Conditions.—Henry MacCormac (*Urologic and Cutaneous Review, December, 1917*) points out that in treating skin lesions during war that is best which is most suitable for the majority, most easily carried out, and least expensive. In treating itch, which is the most common of the skin conditions seen, three conditions must be fulfilled: 1, burrows must be opened to permit access of the parasiticide to the insect and ova; 2, the parasiticide should be of such a nature as to destroy the parasite without producing dermatitis; 3, to prevent reinfection, contact clothing and blankets must be disinfected. The first of these conditions is achieved by a hot bath with soap and a soft brush; the second, by the application of sulphur ointment twice daily for three consecutive days; the third, by means of any steam pressure or sulphur vapor apparatus. Other skin diseases frequently seen during war are impetigo and seborrhea. In the treatment of the latter the skin should be shaved if the region is hairy. In the early stages, calamine lotion is of value. Later more stimulating remedies may be cautiously tried. On the body, weak sulphur ointment and strong perchloride lotion have proved satisfactory. General tonic treatment is also indicated. Psoriasis has been treated with chrysarobin when the body was affected and resorcin, while it was obtainable, when the scalp was affected.

Extrophy of Bladder.—Charles H. Mayo (*Journal A. M. A., December 22, 1917*) reviews the various operations which have been devised for the cure of this rare, but fatal, congenital malformation and points out the defects and reasons for the failure of each of them. The failures in most of the methods of transplanting the ureters into the intestine were due to the lack of recognition of Nature's method of closing ducts by passing them for some distance between the mucous and muscular layers of the wall of the viscus into which they empty. The attempt to preserve this method of emptying by transplantation of the part of the bladder wall containing the ureters failed of success because of the loss of innervation. These two difficulties can be successfully overcome in the case of the ureters by the adoption of Coffey's modification of Witzel's method of implanting the common bile duct. At the site of intended implantation the intestine is incised longitudinally for about one and a half inches down to the mucosa. This is best done in the longitudinal bands of the sigmoid. The ureter is exposed and cut from the bladder, its end split for one quarter inch, a strand of chromic gut is passed through the end, tied, and the short end cut. The intestinal mucosa at the lower end of the incision is then perforated, the needle carrying the long end of catgut attached to the ureter is passed through the perforation and brought out of the wall of the intestine about half an inch below. The end of the ureter is drawn by the catgut through the perforation and the gut is tied by passing the needle once through the peritoneum and muscularis. The incision in the muscularis and peritoneum is then closed in two layers. Only one ureter, preferably the right, should be transplanted at the first operation, the second being done after one or two weeks.

Suppurative Appendicitis.—I. A. Arnold (*International Journal of Surgery, November, 1917*) classifies the treatment as "conditional" and operative. He uses the term "conditional" because there is no medical treatment. This form of treatment is used where conditions are present which preclude operative intervention, such as, Bright's disease, diabetes, certain heart lesions, and the extremities of age. The best plan in these cases is to urge absolute quiet in bed, the patient lying on his right side so that gravitation may keep the pus away from the median line. Locally, ice may be employed. As a favorable outcome of this treatment rupture of the abscess may occur into the cecum, colon, or through the skin of the iliac region; or the pus may become sterile and be absorbed. In connection with operative procedures he advises the following: 1. Do not get too close to the inner margin of the abscess. 2. Do not try to remove the appendix in all cases. 3. Do not irrigate. 4. Do not try to drain the pus cavity with gauze. 5. Do not keep the patient too long in bed.

Pharmacology of Oil of Chenopodium.—William Salant (*Journal A. M. A., December 15, 1917*) contends that the widespread and rapidly increasing use of this volatile oil in the treatment of hookworm disease and other forms of intestinal parasitosis demands a better understanding of its pharmacology and toxicology if accidents are to be avoided. It has definite and important physiological actions on the host of the parasites. It is a powerful local irritant and may cause severe inflammation of the gastrointestinal mucosa. Small doses may prove toxic or fatal to a variety of animals and this toxicity is largely influenced by the mode of the administration of the oil and the nutrition of the animal. Poorly nourished animals are much more susceptible than well nourished. Preliminary feeding of a rich carbohydrate diet or the administration of fixed oils or fats before, or along with, the oil of chenopodium materially increase the animal's resistance to its toxic effects. Absorption of the oil may materially reduce the permeability of the kidneys or cause renal irritation. When absorbed the oil may also cause direct depression of the heart, marked fall of blood pressure, or depression of the respiration. Intestinal peristalsis may also be markedly inhibited. The fate of the oil in the body is little understood, but it is known to be excreted in part through the lungs and is probably in part eliminated in conjunction with glycuronic acid. The liver seems certainly to take part in its detoxification. The treatment of poisoning should include prompt gastric lavage and symptomatic measures to combat its depressant actions. Digitalis and epinephrine should be used for the cardiac depression but caffeine must be avoided as it increases the toxicity of the oil on the heart. The drug should be used very cautiously in poorly nourished and weak persons and probably also in those with liver and gastrointestinal disorders. It should be given with large doses of castor oil and followed shortly with further administration of castor oil. A liberal fatty and carbohydrate diet for several days before the administration of the oil of chenopodium may also reduce the danger of its proving toxic.

Treatment of Cardiac Decompensation.—Frank Bethel Cross (*Long Island Medical Journal*, October, 1917) says that the aim of treatment is to reestablish compensation which has been lost through failure of the heart's reserve to meet added strain. The causes of the added strain must be sought out and removed so far as possible. These include physical exertion, worry, insomnia, acute debilitating disease, etc. During the acute stage of decompensation the patient should be allowed to assume whatever position is the most comfortable to him, preference being given to bed. Morphine is of great value in relieving distress and giving sleep and rest. Oxygen inhalation may help by relieving dyspnea. Venesection may be practised where there is extreme venous engorgement or in less urgent cases an ounce of magnesium sulphate may be given every morning in a small cup of black coffee. Effusions may be removed by tapping. Diuresis may be promoted by the use of theocine or theobromine sodiosalicylate. The diet should consist of milk and restricted amounts of fluid, or the Karrell diet may be prescribed in suitable cases. The most valuable drug for the heart is digitalis, preferably given subcutaneously. For this purpose one of the specialties may be used, or strophanthin may be given instead. For oral administration a standardized galenical preparation of digitalis answers every purpose, but it should be remembered that the infusion is not uniform in activity. Strychnine, caffeine, camphor, and atropine may be useful for some cases, but are not to be given in place of digitalis. In convalescence iron, arsenic, and calcium are of value; the diet should be regulated carefully and both occupation and exercise should be guided by the physician. It may be stated that the immediate prognosis depends on the activities of the physician while the ultimate prognosis depends on those of the patient.

Injuries to the Peripheral Nerves.—Berkeley Moynihan (*British Medical Journal*, November 3, 1917) says that operation is indicated where there is complete division of the nerve; in incomplete division, where progress is arrested; and where there is severe neuralgic pain. Operation should be postponed for one month after closure of the wound when the soft tissues alone have been injured; for two to three months when bone has been injured; and indefinitely as long as signs of progressive nerve recovery continue. The diagnosis of nerve injury should be made at the earliest possible moment and in recent cases, which are to be closed by secondary suture after Carrel-Dakin treatment, union of divided nerves should be tried at the time of the closure. In other cases end to end suture should be practised at the first treatment of fresh wounds. The majority of cases, however, occur in suppurating wounds and operation must be deferred until the suppuration has been overcome for at least a month. During the waiting period the utmost care should be taken to prevent deformity through contracture from the unopposed action of innervated muscles; to prevent the stretching of the paralyzed muscles; and to prevent the formation of adhesions in and about the joints. The operation on the nerves themselves which have proved of the greatest value

are careful end to end suture for completely severed nerves, the careful freeing of the nerve from constricting scar tissue, and the painstaking dissection from partially severed nerves of the scar tissue which invades them, followed by suture of the severed portion. Lateral nerve grafting, nerve lengthening by reflection of a part of the nerve, and bridging by catgut strands are methods which have nothing to recommend them. In operating upon the nerves the utmost care must be exercised to secure accurate apposition of the ends without axial rotation, to avoid undue tension, to avoid bruising of the nerve through handling, to secure perfect asepsis, and to keep the wound absolutely free from blood. After suture the nerve should be laid in a bed of healthy tissue, the part placed in proper splints to prevent contractures and stretching of muscles, massage and electrical treatment should be started after about two weeks, gradually increased in range and strength, and active movement should be begun only after many weeks.

Physical Conditions in Women Warranting Sterilization.—Ellis W. Hedges (*American Journal of Obstetrics*, November, 1917) asserts that a vigorous, determined stand for sterilization of women by tubal resection, when indicated, would save many lives now unnecessarily sacrificed. Among the conditions he specifies as indicating the procedure is eclampsia occurring in two successive labors. In true diabetes mellitus, with general wasting, discovered in a nonpregnant married woman, unless the disease yields readily to treatment or absolute sexual separation from the husband can be secured, sterilization is also indicated. If the disease is discovered early in pregnancy one should perform a combined sterilization and abdominal hysterotomy according to Palmer Findley's technic. These conclusions are based upon the fact that at least thirty per cent. of diabetic mothers die in coma before or during delivery and twenty per cent. more soon afterward, either of diabetes or tuberculosis. Two thirds of the babies of pregnant diabetics are lost by abortion, premature labor, or early death. Chronic nephritis, parenchymatous or interstitial, is another condition warranting sterilization. Thirty per cent. of the mothers and seventy per cent. of the children die, and if the mother survives, her nephritis is invariably worse than before, shortening her life. Where the condition is discovered only after pregnancy has begun, hysterotomy and resection of the tubes can be done under gas oxygen anesthesia without danger and without aggravating the nephritis. In a mother with active pulmonary tuberculosis, one should sterilize. If the disease is latent, it will be lighted up by a pregnancy, with probable early exitus, and the uterus should therefore be emptied and the tubes tied. Even granting that the woman might recover entirely in time, by the method of implanting the ends of the tubes in a slit in the broad ligaments they could later be taken out and anastomosed, thus restoring fertility. In cases with severe cardiac decompensation necessitating Cæsarean section sterilization is also advised. Pyosalpinx, insanity, and epilepsy are mentioned as possible indications for the same procedure.

Nitrous Oxide and Oxygen in Military Surgery.

—H. Edmund G. Boyle (*Lancet*, November 3, 1917) believes that the use of nitrous oxide and oxygen with regulated rebreathing, according to the method developed by Gwathmey, is a distinct advance over the older methods of anesthesia and from the point of view of the patient is infinitely superior to ether and chloroform. The anesthetic is nontoxic and the patients recover from it promptly without any of the usual distressing after-symptoms. It is suitable for almost all cases except where absolute relaxation is required during the entire operation and except in certain abdominal operations where a large incision is to be avoided, such as cases of operations upon the gallbladder or the appendix. It has the advantage in military surgery of not promoting shock and of leaving the patient in an improved condition rather than a worse one than before operation. It, however, requires skillful administration and is not a method which can be recommended for the careless or the inexpert.

Salvarsan and Neosalvarsan Myelitis.—G. W. McCaskey (*Journal A. M. A.*, December 8, 1917) has found records of only four cases of myelitis following the administration of salvarsan or neosalvarsan. He reviews these and adds one of his own. In three of the five cases the drug was given intravenously, in the other two subdurally. One case followed two intravenous doses of 0.5 gram each of salvarsan; a second three doses of neosalvarsan, of 0.7, 1.2, and 1.4 grams, respectively; the third, two doses of neosalvarsan, of 0.7 and 0.8 gram in eleven days. One of the cases following the intraspinal injection had received several intravenous doses without harm before intraspinal treatment was begun, and the latter method had been followed for several doses. It did not seem that alterations in the drug before administration account for these accidents, nor was it probable that the effects were purely arsenical in origin. It would seem that there must be some chemical alteration in the patient's tissues which leads to the rapid destruction of the drug with the liberation of some of the toxic intermediary products of its decomposition.

Edema in Starvation Treatment of Diabetes.—Alfred C. Croftan (*Journal A. M. A.*, December 8, 1917) deprecates the routine practice of starvation in the treatment of diabetes, and points out that it is specially prone to produce harmful effects in the moderate cases which can be made sugar free readily by a restricted diet. Specially dangerous in such cases is the appearance of edema, or its equivalent, gain in weight, which is an indication of forced catabolism of the patient's own tissues to a point beyond the limits of safety. It is a danger signal which calls for the immediate cessation of the starvation treatment and the resumption of feeding. If neglected it may lead to alarming coma or, if this is prevented by the use of alkalis, to a permanent diminution in the patient's carbohydrate tolerance. The occurrence of this edema can be prevented during starvation treatment by the rectal administration of pancreatized oatmeal with alcohol and glycerin, which does not interfere with the rapid reduction of glycosuria, but does prevent the overproduction of acetone bodies.

Gastric Ulcer.—Martin E. Rehfsuss (*Pennsylvania Medical Journal*, December, 1917) suggests varying the treatment according to the underlying associated factors. The food ingested should be made to approximate that of the duodenal chyme. Whites of eggs stimulate but little, while fats cause a secretion and delay motility, but they induce the regurgitation of healing duodenal and pancreatic secretions. Sugar should be used in the early stages of ulcer cure. Carbohydrates rather than milk would rationally follow owing to their reduced evacuation time. The frequent feeding of substances which require three hours or more for their evacuation results in gastric distention which is antagonistic to cure. The Lenhart treatment is objectionable because of its excessive egg content, the presence of which delays evacuation. The Leube method presents too abrupt a transition from rest periods to pronounced stimulation. The Sippy treatment has much to recommend it but it is deficient in that the fat is poorly borne and encourages motor delay while the chemical neutralization is inaccurate. Oil treatment causes unquestioned gastric secretion, but there is a duodenal reflux which antagonizes this phase. It should not be used where there is marked motor impairment. Ideal therapy calls for maximum rest periods with a diet finely comminuted, slightly stimulating, rapidly evacuated, and approaching as nearly as possible duodenal chyme.

How to Administer Quinine.—A. C. MacGilchrist (*Indian Medical Gazette*, October, 1917) says that the best way to administer quinine by the mouth for the treatment of malaria is to give it thrice daily with or soon after meals at intervals of eight hours. The sulphate is the cheaper salt; the hydrochloride and bihydrochloride are expensive, and, if given in such a way that they exist in a concentrated condition in an abraded or damaged stomach, are injurious. As the senior medical officer of the brigade, he issued the following circular to his subordinate medical officers, which contains much of value to civil as well as military physicians with regard to the treatment and prophylaxis of malaria:

"There are two therapeutic agents: 1, quinine; 2, the natural protective forces of the individual. Treatment of a patient with an acute attack of fever is quinine in ten to fifteen grains thrice daily for four days at least, the quinine being continued in five grain doses morning and evening for several days thereafter. A relapse is rare in a person in good health because the natural protective forces are strong. In men in poor health, fatigue, etc., readily produces an attack. It is therefore waste of time, labor, and quinine to give quinine prophylactically to a whole regiment at a time when fresh infection is impossible, unless every individual in that regiment is in a bad state of health. In attacks of fever pick out the men in poor health, a list of whom should be kept. Treatment as indicated above and prophylaxis—quinine fifteen grains after last meal on two consecutive nights a week—should be carried out, confined to the men on this register. There is some evidence that quinine administered continuously for six months or so causes anemia and other disabilities."

Miscellany from Home and Foreign Journals

Effect of Alcohol on the Reproductive Tissues.

—Ada Hart Arlitt and H. Gideon Wells, (*Journal of Experimental Medicine*, December, 1917) added alcohol in daily quantities of from 0.25 to 2.25 c. c. to the food of male white rats for two or more months. This resulted almost constantly in marked degenerative changes in the testicles. Apparently the first effect of the alcohol was to render the formation of spermatozoa incomplete, the heads being formed without normal tails. The next effect seemed to be to prevent the transformation of spermatids into spermatozoa, so that the tubules become filled with an accumulation of spermatids, with but few or no spermatozoa; the spermatids then degenerated. In the most advanced stages, the tubules contained only the marginal cells with few or no spermatocytes or spermatids. The possible relation of this abnormal spermatogenesis to defective offspring is obvious. Some of the rats showed marked differences in the degree of change produced by equal amounts of alcohol. The authors found that the fibrous, interstitial, and vascular tissues of the testicles were not affected, except for intertubular edema compensating for tubular atrophy. Their experimental findings coincided with the necropsy reports in human alcoholics. No other tissues were found to be noticeably changed by the alcohol, and it is a curious fact that the rats examined did not show cirrhosis or fatty infiltration of the liver.

Examination of Recruits for Tuberculosis.

—Léon Kindberg and Delherm (*Presse médicale*, November 15, 1917) state that of the first thousand tuberculosis suspects examined by them 694 were dismissed as nontuberculous, 113 were turned over to the rhinolaryngologists, and 193 were declared tuberculous. The group in which exclusion of tuberculosis was especially difficult included thirty-two cases with apparently definite apical lesions, suggested by bronchitis, cough, fine râles, unilateral impairment of resonance, and pectoriloquy in one of the supraspinous fossae. X ray examination, however, showed the apices clear, or at least, homogeneous and clearing up upon coughing. Stress is laid on the latter feature; the decision should be postponed until after detailed examination of the other parts of the chest, the necessary deep inspirations and coughs often serving to inflate previously inactive apical tissues. In twenty-seven other cases, clinical examination was negative but the x rays revealed definite changes at one or both apices; careful sputum examinations proving negative, these changes were ascribed to Sergent's apical pleuritis or held to consist of old, healed tuberculous foci. The term pretuberculosis is condemned by the authors, who believe only in either an active or a healed tuberculosis, or a condition arising from some other cause. In the occasional doubtful cases in which some suggestive signs, both clinical and radiological, were observed, chief reliance for the exclusion of tuberculosis was placed upon the examination for bacilli; the subsequent clinical course of the cases dismissed as nontuberculous confirmed the reliability of this test, if properly conducted.

The first sputum coughed up by the patient in the morning will often alone show the tubercle bacilli when present. Petri dishes should therefore be made available to receive the sputum at this time; from them suspicious material can be selected easily. Where two examinations proved negative, the writers applied the potassium iodide test and frequently the antiformin method or that of Erlandsen: Admixture with an equal portion of 0.6 per cent. sodium carbonate solution, incubation for one day, decantation, admixture with four parts of 10.25 per cent. soda solution, and centrifugation.

Irritable Heart and Amebic Dysentery Carriers.—Margaret W. Jepps and J. C. Meakins (*British Medical Journal*, November 17, 1917) found amebic dysentery carriers in considerable proportion among an unselected series of cases of irritable heart in men returned from the Mediterranean war zone. In many of the cases other intestinal parasites were also present, and at least a dozen cases showed only the small forms of *Entamoeba histolytica*, which made the diagnosis difficult. *Entamoeba histolytica* was present in about thirty-seven per cent. of the entire series of cases, but several stool examinations, up to six or more, were often required before the parasites were found. Treatment with emetine bismuth iodide cured about ninety-five per cent. of the cases, and of these fifty-five per cent. showed marked improvement in heart condition. Several forms for the administration of the drug were tried, including the use of stearin coated pills and tablets, but the dry, powdered drug enclosed in cachets was found to be the most effective.

Kidney Function in Diabetes Mellitus.—R. Fitz (*Archives of Internal Medicine*, November, 1917) notes that the diabetic kidney has been shown both clinically and experimentally to have a more or less definite pathological appearance which is comparable with that obtained in animals upon passage of acetone bodies from the blood into the urine. He reports clinical observations made in a series of cases, urea excretion being studied according to McLean's adaptation of Ambard's methods, and chloride excretion in relation to its concentration in the blood plasma by Ambard and Weill's constants. In the majority of cases the urea index was found normal or high, the latter due in part to rapid water elimination. In six cases of fatal diabetic coma, however, it was abnormally low, renal function apparently growing progressively worse as coma persisted. The blood plasma chloride was usually found lower than would be calculated from the chloride excretion according to the formula of Ambard and Weill. Edema due to sodium chloride retention was at times encountered. In one instance it was accompanied by a falling urea index and an increase of acetone in the blood. The edema cleared up promptly upon restriction of sodium chloride intake. Edema following administration of sodium bicarbonate is believed due to salt retention, the plasma chloride and urinary chloride excretion diminishing when bicarbonate was given.

Microscopic Examination of Nasal Mucus in Leprosy.—J. A. Johnston (*Philippine Journal of Science*, May, 1917), after microscopical studies in several thousand cases, finds himself wholly in accord with the views of Kedrowski and Bayon to the effect that the organism causing leprosy has two stages in its life history, a nocardial or streptothric nonacid fast form and a bacillary and acid fast form. Nothing is to be gained from the examination of nasal mucus when definite clinical signs of leprosy exist. In the absence of clinical signs, acid fast bacilli in the nasal mucus should not be regarded as *prima facie* evidence of leprosy. The individual may, however, be regarded as suspicious, and repeated examinations made. The examination of the circulating blood by the method of Smith and Rivas should receive far more attention than it has hitherto received, and is of much greater importance than examination of the nasal mucus. To insure success, the blood specimens in the Smith and Rivas procedure should be taken during the febrile paroxysm. Among 248 cases of anesthetic leprosy, in which reliable findings in the nasal mucus would be of actual diagnostic value, only 12.9 per cent. gave positive results. It is therefore concluded that examination of the nasal mucus is of no value as a routine measure.

The Brain in Shell Shock.—F. W. Mott (*British Medical Journal*, November 10, 1917) was able to study microscopically the brains from two cases of apparently pure shell shock. In both cases the brain showed marked macroscopic signs of congestion with many small ecchymoses on its surface. Microscopically one of the cases showed a generalized early chromatolysis, more or less marked signs of exhaustion of the kinetoplasm, congestion of the vessels of the pia arachnoid, scattered microscopic subpial hemorrhages, congestion of the vessels of the internal capsule, pons, and medulla, and hemorrhages into their sheaths. In the second case the vessels of the cortical gray matter were dilated but empty and the perivascular spaces were dilated, chromatolysis was more or less marked, and the other changes were similar to those found in the first case except for the fact that there was also an extensive extravasation of blood into the substance of the lower surface of the orbital lobe. Two hypotheses might be offered to explain the anatomical lesions, the one suggesting that as a result of the compression of the air and gases the skull and spine are struck as if with a solid body and the vibration, transmitted through the cerebrospinal fluid, causes molecular disturbances of the nerve tissues. The other suggests that the compression produced is followed by rapid decompression with the liberation of gas bubbles and the development of embolism. It would seem probable that both forces—compression and decompression—acted to produce venous congestion and arteriocapillary anemia with their resulting secondary effects. The congestion and anemia would explain such symptoms during life and in nonfatal cases, as mania and excitement on the one hand, and headache, amnesia, vertigo, stupor, inattention, fatigue, mental confusion, and terrifying dreams, on the other.

Influence of Hypnotic Suggestion on Inflammation.—J. Arthur Hadfield (*Lancet*, November 3, 1917) records the production of blisters by hypnotic suggestion in the case of a very susceptible man. When the blisters were produced with the suggestion that there would be no pain they showed no evidences of inflammation and were very slight. When nothing was suggested with reference to pain and their development was more marked, pain was very annoying, and the reaction of inflammation was pronounced. The same alterations in reaction were observed by blisters produced during hypnotic sleep by means of a hot iron, those caused thus, with the suggestion of no pain, were rudimentary and not associated with evidences of inflammation.

Meningitis Due to Micrococcus Florens in an Infant.—Wilbur C. Davison, Atala S. Davison, and Milo K. Miller, (*Journal of Experimental Medicine*, December, 1917) isolated a Gram negative micrococcus from a case of meningitis which, because of the luxuriant growth on all the mediums tested, they called *Micrococcus florens*. Virulence tests appear to prove the organism pathogenic for mice, rabbits, and monkeys, producing septicemia, and in the latter two animals, purulent meningitis. The results gained from the biological reactions and the agglutination tests suggest the possibility that the organism, though morphologically similar to the meningococcus, is yet entirely distinct. A review of the literature failed to show any description of a Gram negative micrococcus which will grow luxuriantly on all mediums tested, will form no pigment, and will ferment arabinose, dextrose, and galactose.

Acute Dilatation of the Uterus.—N. Stone Scott (*American Journal of Obstetrics*, November, 1917) maintains that acute uterine dilatation early in pregnancy is a far more common condition than one would suppose from perusal of medical literature. It is also of great importance to the patient, for if the surgeon does not bear in mind the possibility of it, he may do irreparable injury by instituting a wrong course of procedure or leaving unfinished a necessary operation. In the first of Scott's four cases, loss of tone of the uterus took place during curettement after a miscarriage, the curette in the previously small uterus suddenly going in up to the handle. In two other cases it occurred spontaneously after a miscarriage, and in the fourth during preparation for curettement in the presence of inevitable abortion. The condition soon corrected itself in each case upon rest in bed with or without ergot and quinine. Histories of two additional cases reported to the author by colleagues are given. Stress is laid on the fact that the acute dilatation during early pregnancy has no appreciable influence on the bleeding which accompanies the miscarriage. The hemostasis following complete placental separation after an ordinary miscarriage is thus believed to depend directly on the blood and vessels themselves rather than upon uterine contraction, as after labor at full term. The lesion leading to the uterine relaxation is believed by Scott to be in the cornua, where interference with uterine innervation would be most marked. Three of his cases showed placental implantation in one or the other horn and the fourth had a small fibroid in the same place.

Spirochetes in the Urine in Trench Fever.—A. T. Nankivell and C. E. Sundell (*Lancet*, November 3, 1917) examined ninety-nine specimens of urine from twenty-six patients with trench fever, finding spirochetes twenty-nine times in more than 300 films. They never found spirochetes in films made from normal men or from those ill with other conditions. The spirochetes were found as early as the first twenty-four hours of the disease, but most commonly the men were seen only in the relapses when spirochetes were not infrequently found. In many cases a long series of negative examinations would be followed by one in which spirochetes would be present. The spirochetes varied from one in several films to large numbers in every film. The positive findings seemed to be commonest in specimens taken about twenty-four hours after the recurrent rises in temperature. The organisms have not been found in blood films taken from the same cases and it has been impossible to transmit the disease to any of the experimental animals.

Syndrome of Mild Reversed Peristalsis.—Walter C. Alvarez (*Journal A. M. A.*, December 15, 1917) arranges a wealth of evidence to show the enormous importance of disturbances in the motor functions of the gastrointestinal tract and the relative lack of importance of secretory disturbances as causes of symptoms. Disturbances of the motor functions may be of four types: 1, increased rate of the current; 2, slowing of the current; 3, complete stoppage of the current; and 4, reversal of peristalsis. The last is the severest disturbance and yet is one which, in varying degrees, is extremely frequent. In the opinion of the author, which is supported by evidence and argument, mild reversal of peristalsis is the usual cause of such symptoms as vomiting, regurgitation, pyrosis, belching, nausea and probably also of coated tongue and foul breath, globus, fullness after eating only a few mouthfuls, and biliousness.

Determination of Pneumococcus Types.—O. W. H. Mitchell and Walden E. Muns, (*Journal of Medical Research*, November, 1917) describe a method which does away with the injection of a mouse, whereby Type I infections may usually be determined within an hour or two after collection of the sputum. The principle is based on the detection of precipitinogen derived from pneumococci in the sputum. The results were checked by mouse inoculation and subsequent agglutination. The success of the method depends upon the thorough dissolving and thinning of the sputum in normal saline and reduction of the tough, tenacious substance to a thin fluid. The technic is as follows: Sputum, collected in a sterile container, is brought immediately to the laboratory. Of this, five c. c. is pipetted into a small mortar, and relatively fine sand is added so as to make a rather stiff mixture, which is then ground with a pestle for about three minutes. The thick, tenacious mass should have become a gritty fluid paste, to which ten c. c. of normal saline is added, two c. c. at a time. Sputum, sand, and saline are mixed for a minute or so, and the sand is allowed to settle to the bottom. The dissolved sputum collects over the sand and is pipetted off into a clean centrifuge tube. The fluid,

usually thin, milky, and uniform, amounts to about nine c. c. A second solution of the sputum is made by adding ten c. c. of normal saline to the sand in the mortar in the manner described above. The first more concentrated solution is used for the immediate test, and the second may be held in reserve for use later, in case of accident. Complete clearing of both solutions is accomplished by centrifuging at high speed. Into the first of three small test tubes 0.2 c. c. of antipneumococcus serum Type I is pipetted; into the second 0.2 c. c. of antipneumococcus serum Type II is put; and into the third 0.2 c. c. of antipneumococcus serum Type III is placed. Then one c. c. of the first solution of the sputum is pipetted into each of the tubes, and all three are plugged with cotton. The tubes are well shaken to mix their contents, and are then placed in a water bath held at 37° C. The length of time the tubes are left in the water bath depends upon the appearance of a reaction. If a lens is used the precipitate may be distinctly seen two or three minutes after the mixture of serum and sputum solution. As the tubes are left at rest in the water bath feathery white flakes drift to the bottom and collect in a typical white mass. In a negative test, there is no reaction of any kind and very little sedimentation.

Endocarditis Lenta.—R. Debré (*Presse médicale*, November 8, 1917) points out the relative frequency of this condition, as yet insufficiently recognized in textbooks. Errors of diagnosis and prognosis are still commonly made in relation to it. The incidence is greatest in adolescents and young adults, and there is almost invariably a history of rheumatic fever in childhood. The onset is insidious, being marked by gradual loss of strength and power of endurance, anorexia, loss of weight, feverishness and chilliness at irregular intervals, and anemia, a group of symptoms often ascribed by the patient and his relatives to a "grippy" sore throat or bronchitis. Frequently there are joint and muscle pains; several joints may even become hyperemic and swollen. Soon after certain signs are likely to appear which will permit of definitely diagnosing the condition. Among them, skin manifestations are of primary importance, chiefly purpura and erythema nodosum; the latter condition, if met with at the finger tips, is especially suggestive. Splenic enlargement is another important sign, though at times it leads to confusion with pernicious anemia or malaria. Cardiac examination will reveal a valvular lesion, usually mitral; the physician should not be deluded, upon noting that the murmur remains unchanged at successive examinations, into believing the lesion at a standstill. Blood culture, if it reveals a streptococcus, clinches the diagnosis of slow, malignant endocarditis. Additional manifestations of the disease are, a masklike brownish discoloration, visual disturbances, subacute nephritis and tachycardia, with or without arrhythmia. The chief complications, usually the ultimate cause of death in these cases, are embolism and arterial aneurysm, leading to brain softening, apoplexy, or coronary blockage. The total duration of the disease is, as a rule, from six months to one year.

Proceedings of National and Local Societies

THE AMERICAN CONGRESS OF INTERNAL MEDICINE.

*Annual Meeting, Held December 27 and 28, 1917,
at Pittsburgh, Pa.*

The President, Dr. R. W. WILCOX, in the Chair.

Dr. JOHN A. LIGHTY, of Pittsburgh, in the address of welcome in behalf of the medical profession of Pittsburgh, expressed the consciousness of the honor conferred by the presence of the distinguished members of the American Congress of Internal Medicine, whose aims and accomplishments it would be pleasant to recount as well as the achievements of those members who had done pioneer and advance work in internal medicine, but that would have to be spoken of by others, his few allotted moments being devoted to the introduction of a few medical characteristics of the great city which had the pleasure of welcoming this delegation of scientists.

Pittsburgh might well be called the industrial centre of the world. It was centrally located and its railways and waterways had made transportation facilities unsurpassed. In consequence it had become the medical centre for a very large area of the country. It was, in fact, to be considered a suburb of Philadelphia. Up to recently the interests of the profession, in relation to this large area, had been largely surgical and the city, as a result, could boast of an amount and quality of surgery which could scarcely be surpassed in any city of the world. The names of men who had made themselves famous here in the practice of surgery during the past fifty years included Walters, known for his conservative surgery; Sutton, known for his early introduction of the principles of Lister, Pasteur, and Lawrence Tait; the McCanns; the Dixons, and the brilliant, beloved, and lamented Stewart. While internal medicine had, in a way, kept pace with surgery, it was only recently that it might be said to have come into its own, particularly in preventive medicine as well as in other well recognized activities. Formerly, Pittsburgh had the highest incidence and mortality in typhoid fever of any city in the United States, but through the direction of the late Eugene Matson, bacteriologist and director of the Department of Public Health, unsurpassed filtering beds had been laid in the surrounding waters, so that they were now clean and typhoid had been eliminated. The work of the laboratories of the city was now directed toward the prevention of diseases which were likely to occur in the industries here represented. Internal medicine had given valuable assistance in the elimination of the smoke nuisance; diseases of the lungs in relation to smoke and soot had been particularly studied in the laboratories of the University of Pittsburgh School of Medicine. In many other ways internal medicine had sought to bring about prevention of disease, accidents, and calamities, hitherto frequent and now few in this community. The internists of the city as well as the profession at large deeply appreciated the benefits which would accrue from the meeting of such a

body of scientists as the Congress of Internal Medicine represented.

Dr. THOMAS REILLY, of New York, in response to the address of welcome, expressed for all the members of the Congress their pleasure in being able to be present, for three or four months ago it had been feared that the meeting would not be possible, since the conditions that the war brought about made it necessary for many medical societies to close their doors for the time being. The railroad even had refused to sell return tickets. However, in spite of all this discouragement it was felt that this meeting was a necessity. Certainly, the men who had gone to the expense and trouble that travel in these times entailed had shown their belief in the desirability of the meeting and it was hoped that the scientific sessions would prove to be of benefit to all.

Dr. R. W. WILCOX, of New York, the president of the Congress, explained that he had delegated the vice-president, Doctor Bartley, to prepare and present the presidential address as he had feared that his multitudinous duties in connection with his Army service would prevent his being present at this meeting. He looked forward to hearing from Doctor Bartley a much better address than he could himself have prepared.

Dr. E. H. BARTLEY, of Brooklyn, vice-president of the Congress, was very glad that matters had been so arranged that it had been possible to hold the interesting and instructive session that had been planned. There was, of course, a feeling of regret at the unavoidable absence of the thousands of brother physicians who had been called away to serve their country. It had been expected that the attendance at the meeting would be smaller than would otherwise have been the case, but it was hoped that the interest of the program would to some extent counterbalance this.

The membership of the Association had been increased by more than 100 since the previous annual meeting. Circularization had been deemed undesirable and the Council of the Congress had decided to depend on the judgment of its fellows in presenting the names of desirable members so that the best and most representative men should be chosen. Everywhere internists were scarce on account of the war, but many, because of age or other factors, could not go to the front and these were overwhelmed with what was entailed in "doing their bit" in loyal and willing service to their country at home. Their work was of supreme importance in the lives and health of those left behind, whose labor made it possible for others more favored to strengthen the army with numbers. It looked as if the war were to be a long one and the health of future soldiers was an important matter. It had been shown in the examination of recruits that as high as sixty per cent. of applicants for army service were unfit. This had been a tremendous surprise and should be the cause of concern for the future. There were other fields for the internists remaining at home; when the wounded and maimed began to come

back, new problems would arise. There was now a large field for the correction of defects in those who had been found to be unfit and those who were soon liable to be called as they approached the draft age. Certain defects were best treated in the young. Boards of health and of education had taken up this question as a function of the State; labor organizations also had taken this matter up. The medical profession had been remiss in not taking the initiative. It was time now to take some concerted action for the improvement of the health of the masses. There should be more supervision of the young, even before they came to school age. Statistics showed that in New York there were 20,000 children with more or less serious lesions of the heart; this matter could be handled. There were also various conditions, such as defective nutrition, deformities, endocrine gland affections, etc., that demanded the attention of the internist. Biological chemistry had paid more attention to the effect of food on animals than on humans. Diseases of nutrition, such as beriberi, pellagra, and scurvy, had not been completely mastered. In many children poor heredity had often to be overcome and in this line much had been accomplished by the use of internal gland substances. Many poorly nourished children grew up inefficient. The hope of the country was not in the children of the rich, the unprolific class, but in the children of the masses. Whether these children would be able to maintain the traditions of American life would depend on how well the nonmilitary medical profession shouldered its patriotic duty. America must be made equal to the tasks of the future after the war and efficiency depended on good health. The great work of reconstruction of the men returning from the trenches would depend on the medical profession and that work would be to a large extent unremunerative, but who was there that doubted it would be done and well done? In that national duty physicians would not be slackers. The medical men whose services had been contributed to the army had done this at great personal sacrifices, but the medical men who remained at home performed services no wit less valuable and with selfabnegation of which the world knew nothing.

Dr. H. STERN, of New York, secretary general, reported that the Council had had ten meetings during the past year and had added 130 new members, the organization now mustering 450 members.

Dr. EDWARD E. CORNWALL, of Brooklyn, announced with deep regret the deaths that had occurred during the past year of members of the Congress, chief among them being Dr. Claude Lamont Wheeler, editor of the *NEW YORK MEDICAL JOURNAL*, a man of admirable and delightful personality and very well known for his literary as well as his professional attainments; Dr. Henry L. Coit, of Newark, whose name was intimately associated with movements for infant welfare; and Dr. LeRoy Satterlee, also widely known and much esteemed. Doctor Cornwall then read the list of officers for the coming year: President, Doctor Butler; vice-president, Doctor Bartley; treasurer, Doctor Caille; secretary general, Doctor Stern; assistant secretary, Doctor Cornwall; councillors, Doctor Wilcox, Doc-

tor Tuley, Doctor Sajous, Doctor Satterthwaite, and Doctor Teish.

Röntgenologist and the Internist.—Dr. CHARLES D. AARON, of Detroit, read this paper. In the opinion of the writer all the possibilities of the Röntgen ray had by no means yet been discovered. No sooner was one instrument or one technic perfected than a new current of ideas set in, increasing or superseding the value of the former ones. Thus it might be said that the science of röntgenology was still in the active phase of evolution and would so remain until no further advance was possible or until the actual nature of the rays themselves was discovered, a matter still hidden from knowledge. The quality of positiveness had been given to this science by the rapid advances that had been made; many of the claims previously made for it had been disproved, but at the present time its positive claims commanded for it the universal respect of the entire medical profession. X ray diagnosis was undoubtedly an essential part of the procedure of scientific examination in all modern and well equipped hospitals and the office of the modern scientific physician was incomplete without its Röntgen ray equipment. The practical value of the Röntgen ray as an aid to diagnosis was assured.

There were, however, a number of points to be considered in connection with this subject. There was necessity for much more thorough correlation between Röntgen ray work and the practice of medicine. Too, careful technic was not always to be obtained. The lack of uniformity of details in technic was a great stumbling block to perfect results. For instance, there was too much diversity in regard to test meals; not only had different authorities in different countries various standards in this regard, but different laboratories all over the country were using entirely different methods. Thus no standard of comparison between the work of two men could be set up. Laboratories set up individual standards and were unwilling to compromise or to modify their ideas, and specialists adhered to their own preconceived methods and refused to experiment with others equally good or better. This was one of the greatest drawbacks to real scientific progress which would only be made when individual proclivities were abandoned and agreement made upon a universal procedure in order to further scientific knowledge.

The ambition of Röntgen ray specialists at present seemed to be only to render supplementary service, but this was excluding vast possibilities. For instance, in early cases of tuberculosis, or in cases of osteitis fibrosis cystica, the Röntgen ray could prove the diagnosis before a definite clinical picture was found. It should, however, be remembered with regard to the Röntgen ray that the pictures were shadows, not actual photographs of facts, so röntgenologists could not hold that this evidence took the place of clinical facts. It was necessary for the röntgenologist to know the clinical facts where they existed. To be well equipped for his task he should have a knowledge of histology, pathology, and microscopical anatomy, for without this knowledge he was unable correctly to interpret

the plates. It should be further remembered that röntgenology had two sides; the expert röntgenologist interpreted the findings, but it was necessary for him to have expert technical assistants to make the plates. Frequently physicians were unable to interpret the plates correctly because they lacked the proper technical knowledge. At operation or autopsy an hourglass stomach was easily discoverable, but there were conditions such as cholecystitis, appendicitis, or stomach conditions which gave the same symptomatology; in such cases the röntgenogram could differentiate.

There was no doubt that the Röntgen diagnosis had its limitations as well as its possibilities. In interpretation, the details of the position of the patient and of the tube should be taken into account. If universal technic were employed, it would dispel many uncertainties as at present the personal equation was largely a deciding factor in Röntgen ray interpretations. When the work was once placed on a standardized basis, results could be compared and reported. It might be felt by many workers that their experience was not matured enough to formulate irrevocable plans, but this could be finally done by the universalization of technic in the practical application of the science. The object of this paper was to urge this consummation and to call attention to general principles rather than to go into details.

Röntgen Rays in the Diagnosis of Diseases of the Thoracic Cavity.—Major GEORGE C. JOHNSTON, of Pittsburgh, stated that the subject was so extensive that he could do no more than touch lightly on the various points in the time allotted. In making an examination of the chest it was always wise to proceed according to a certain routine in order not to be misled by the history of the case. The surgeon could open the chest and find what was there, but not so the internist. In clinical work, therefore, it was a good rule in every examination of the thorax to note the following points: Heart—size, shape, position, and action; aorta—size, position, dilatation, aneurysm, calcification; lungs—apices, illumination of enforced inspiration, relative distensibility; diaphragm—degree of visibility, curvature, excursion, fixation; mediastinum—size, shape, presence of opaque bodies, tumors, aneurysm, adenopathy, persistent thymus. Following this general survey one proceeded to examine in detail.

In an examination of the lungs, study was made not only of lung tissue but of the pleural cavity and the diaphragm. In bronchopneumonia it would be found that both lungs could be seen to be affected, there were irregular shadows over both lungs, and the visibility of the diaphragm was slightly impaired, but the excursion of the diaphragm unimpaired. In pulmonary edema, on the contrary, the screen appearance of the thorax was very unusual. If the edema was extensive it would be found that the heart and aorta shadow, diaphragm shadow, and all chest landmarks were lost. Emphysema would show an increased radiability of the lung on one or both sides confined to the emphysematous area.

In lung tumors those most often seen were the sarcomata and the appearance was very striking. In

the advanced cases one or several globular masses of rather uniform density might be seen to invade the lung tissue. The tumor wall was sharply defined; this was in contradistinction to carcinoma of the lung. The remainder of the lung tissue might be perfectly healthy. Carcinoma of the lungs was usually secondary and prone to metastasize from the breast or prostate; it occurred frequently and gave an appearance of very light lung suppuration, but without the bronchial marking. The lung tissue involved resembled the body tissue in a case of periosteal sarcoma. The disease appeared at the hilus and radiated out into the parenchyma of the lung. In early stages it appeared as though interlobular, but later might involve the lung very extensively.

Diseases of the pleura were easily diagnosed by means of the x ray. The first axiom was: A visible pleura was always pathological. Differentiation could be made by means of the x ray between acute pleuritis with effusion, chronic empyema, hydro-pneumothorax, pyopneumothorax, and interlobular pleurisy. Many mistakes were made in the diagnosis of conditions within the pleural cavity. It was sometimes very difficult or even impossible to differentiate between opaque fluid in the pleural cavity and an unresolved pneumonia involving the entire lung. This condition was by no means rare and would sometimes require the aspirating needle in order to clear up the diagnosis. Pulmonary abscesses seldom extended to the periphery of the lung and required very careful localization. It was very unwise to examine a patient for the determination of the presence of a pulmonary abscess after coughing and expectorating pus. It was better to wait and give the abscess cavity a chance to become filled with pus, at least partially, and then examine in the erect or semirecumbent posture.

In all examinations of the chest by means of the x ray it was well to remember that one was differentiating various physical conditions of the lungs and endeavor to interpret these in terms of pathological entities. No attempt should be made to interpret the findings without careful correlation with other physical findings, history, etc. The writer hesitated to make a diagnosis of pulmonary tuberculosis in any but the most advanced stages by means of the Röntgen ray findings alone. Taken in conjunction with the clinical signs, temperature and weight record, and history, even trivial x ray findings might acquire great significance and enable the all important early diagnosis of tuberculous infection in many cases to become an accomplished fact. In advanced cases one saw Dunham's fans, lung suppuration, tuberculous adenopathy, thickened pleura, cavitation, and local pneumonia. The degree of activity of a tuberculous lung lesion was inversely proportionate to the distinctness of outline or limiting border. If outline was sharp, disease was quiescent, but if it shaded off into outlying tissue it was active. The above could not be told on the screen, but one should use low unit radiation for fluoroscopy and should make stereoscopic pair for final detail.

Röntgen examinations of the heart were performed for the purpose of obtaining information as to the size, shape, position, condition of aorta, and presence or absence of pericarditis. The

only way to learn anything about this particular branch of medicine was to examine the heart by every means recorded, then study the same heart before the screen and in this way acquire the ability to interpret the visualization of the heart in action so beautifully seen upon the screen. The aorta was best inspected by means of the screen and considerably more attention should be paid to determination of aortitis than had been done in the past. An early determination of aortitis with proper treatment thereof would result in an increasing rarity of aneurysm. Any deviation in size or shape of the aorta required explanation, but it did not necessarily mean aneurysm.

The writer realized that many books could be written upon the subjects touched upon and the idea of this paper was simply to reawaken the internist to the value of the fluoroscope and plate in the examination of the chest as a means of stimulating his acuity in other methods of physical examinations as well as the advantage of having all the possible evidence in any given case.

Value and Limitations of Radiotherapy in Internal Medicine.—Dr. RUSSELL H. BOGGS, of Pittsburgh, called attention to the fact that it was only lately that internists seemed to realize that radiotherapy had become a strict specialty in the hands of those with proper experience. They had, however, appreciated more thoroughly the value of this agent, particularly in glandular disease. The selective action of the rays for epithelial cells explained why certain diseases could be cured while others remained unaffected. The epithelial cells were affected in proportion to their vitality; dead cells were unaffected, but fully mature cells were very resistant.

When one stopped to consider that over ninety per cent. of cases of tuberculous adenitis treated with radiotherapy could be permanently cured without leaving any deformity, that the symptoms of exophthalmic goitre were relieved in a large percentage of cases, and that Hodgkin's disease and lymphosarcoma would disappear in nearly every case and were not any more prone to recur than after a surgical operation, it was apparent that this subject could be carefully studied by the internist to advantage. No one who had seen a large number of such cases would fail to realize what an important place radium and the Röntgen rays took in many of the internal diseases. Much good work had also been done and reported on diseases of the blood and blood forming organs, the value and significance of which were not generally recognized by the medical profession. Many cases of leucemia had been treated, and while radiotherapy offered more than any other method, the end results were usually unfavorable. It was remarkable how the spleen and lymphatic glands as well as the blood count would improve after a few Röntgen treatments were given; many clinical cures were obtained lasting from a few months to seven or eight years, but still one must give a guarded prognosis in leucemia because it was impossible to tell when a relapse would take place. On this account the treatment must be regarded merely as a palliative measure. Other fields for radiotherapy, such as uterine fibroids and carci-

noma, were so well known that they need not be enlarged upon, but they all showed the possibilities of radiotherapy, the results of which were about the same as with radium.

Dr. E. H. BARTLEY, of Brooklyn, said that Doctor Johnston's paper reminded him of an interesting case he had seen some two years ago which, in spite of all investigation for a primary focus elsewhere, appeared to be a primary sarcoma originating in the bronchial gland. A thorough examination was made at autopsy and no other point of involvement was discovered. He could not say that this was very rare, but it seemed worth while to mention. In regard to the x ray in the diagnosis of pneumonia, he was interested in those cases occurring in children; in this type the disease began at the periphery and extended to the hylus though the speaker was not prepared to say that it did so in adults. In children the physical signs occurred only when the disease reached the bronchi. The x ray showed that it began at the pleuræ and extended inward.

(To be concluded.)

Letters to the Editors.

LIGHT ON THE PROBLEM OF THE FEEBLE-MINDED.

105 EAST TWENTY-SECOND STREET,
NEW YORK, January 11, 1918.

To the Editors:

May I write to express our hearty appreciation of the editorial in the NEW YORK MEDICAL JOURNAL, January 5, 1918, entitled, *Who Is Feeble-minded?* Although it was apparently suggested by J. E. Wallace Wallin's *Problems of Subnormality*, the editorial contains an unusual insight into the problem of feeble-mindedness and a comprehensive idea of what is ultimately needed to meet it.

As you intimate, physicians in general are all too unaware of the problem in its entirety and in its personal and individual aspects. The physician, before all others, comes into intimate personal and family contact with all the afflicted, including those afflicted mentally. It is therefore, to the physician that we must first look for keen appreciation of the bearings of subnormality and feeble-mindedness on medical and community problems. One of the chief efforts of private and public organizations now endeavoring to study the feeble-minded is to get an accurate estimate of how many there are, who they are, and where they are. Surely the physician is the one to give this information as soon as he is aroused to the pressing need of securing and divulging it.

Organized movements, such as that which the New York Committee on Feeble-mindedness represents, can accomplish a certain amount in advocating better legislation, in securing more and better equipped institutions for the feeble-minded, and in educating the public to a certain extent; but, as you very correctly remarked in the editorial I refer to, the solution of the problem of the feeble-minded depends not so much on the accomplishment of the first two objects, which are more or less static, but depends largely on a thorough appreciation of what feeble-mindedness is and how it should be dealt with by representative people in a community. The community attitude toward the feeble-minded is one of the most important questions with which we are forced to deal. Any institution, organization, or publication that can aid in giving the physician a better appreciation of this pressing problem and can influence him to demand of the medical schools more and better training in psychology will be aiding at the most important point.

Very sincerely yours,

L. E. BAUMANN,
Assistant Secretary, New York,
Committee on Feeble-mindedness.

Book Reviews.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

Kirk's Handbook of Physiology. Revised and Rewritten by CHARLES WILSON GREENE, A. M., Ph. D., Professor of Physiology and Pharmacology, University of Missouri. Ninth American Revision. With 509 illustrations, including many in colors. New York: William Wood & Company, 1917. Pp. 9x-790. (Price \$3.75.)

This ninth edition has been prepared with special attention to the student's needs. It seeks to arouse his interest through, as it were, a genetic entrance into physiology by means of the laboratory and leading to the thorough grounding necessary for clinical medicine and surgery. The subject is therefore developed from the simple to the complex, beginning with the minute histological structure and cell activity and proceeding to the complex functions of the various organs and systems of the body. Brief and concise treatment is given each separate topic; some of the latest results of investigation in certain departments are incorporated. This is particularly the case in regard to the work upon vitamins and the disturbances of nutrition. These are still wanting in other sections, some fuller report of the latest research which would bring the work more into line with a unifying dynamic activity, which is conceived as infusing all physiological mechanisms. This lack is felt throughout the work and leaves the various topics somewhat separated from each other, as well as limited in presentation and discussion. Nevertheless the clear form of discussion and the simplicity of technical outline together with the illustrations in keeping with this character make of it a convenient and valuable manual.

The Practical Medicine Series. Comprising Ten Volumes on the Year's Progress in Medicine and Surgery. Under the General Editorial Charge of CHARLES L. MIX, A. M., M. D., Professor of Physical Diagnosis in the Northwestern University Medical School. Volume VI: *General Medicine.* Edited by FRANK BILLINGS, M. S., M. D., Head of the Medical Department and Dean of the Faculty of Rush Medical College, Chicago, Assisted by BURRELL O. RAULSTON, A. N., M. D., Resident Pathologist, Presbyterian Hospital. Volume VII: *Obstetrics.* Edited by JOSEPH D. DE LEE, A. M., M. D., Professor of Obstetrics Northwestern University Medical School with the Collaboration of EUGENE CARY, B. S., M. D., Assistant Gynecologist, St. Luke's Hospital; Instructor in Gynecology, Northwestern University Medical School. Volume VIII: *Pharmacology and Therapeutics.* Edited by BERNARD FANTUS, M. S., M. D., Associate professor of Medicine, Subdepartment of Therapeutics, Rush Medical College, Chicago, Ill. *Preventive Medicine.* Edited by WILLIAM A. EVANS, M. S., M. D., LL.D., Ph. D., Professor of Preventive Medicine Northwestern University Medical School. Series 1917. Chicago: The Year Book Publishers, 1917. Pp. 384. (Price, \$1.50.)

Frequent notices in these columns of this series leave little to be said on the series as a whole. The editors undertake to select and summarize the most important contributions to medical literature and to present the result under ten main heads, one subject to a volume. The general plan and scope of the three volumes, General Medicine; Obstetrics; and Pharmacology and Therapeutics and Preventive Medicine are much the same as those of preceding years. General Medicine includes sections on Infectious Diseases, the Gastrointestinal Tract, Diseases of the Liver and Gallbladder, and Diseases of the Pancreas. The editors appear to have made a happy selection of material and to have presented the main points of progress, especially in the paragraphs on typhoid, the paratyphoids, and dysentery, which show the results of work under war conditions and some conclusions which probably would not have been arrived at except under those conditions. The volume, on the whole seems to reflect war's stimulus to comment and research. The same may be said of the volume on Obstetrics, as to the successful selection of material from a large litera-

ture. A careful inspection of the volume on Pharmacology and Therapeutics and Preventive Medicine reveals the accomplishment of the editor's purpose as stated in the introduction: "To deal with a comparatively limited number of current topics that seem to him of practical importance to the medical practitioner." The first part of this volume contains sections on general therapeutic technic; etiologic therapy, including sections on antiseptics and disinfectants, protozoicides, alleged specifics and anthelmintics; restorative therapeutics; symptom therapy; toxicology, war time economy in drugs; and nonpharmaceutical therapeutics. These volumes, in our opinion, give a clear bird's eye view of the year's progress and are of value alike to the man who may not have time to keep up with the literature himself month by month and week by week, and to the man who reads the journals and needs some one to sift the wheat from the chaff.

Births, Marriages, and Deaths.

Married.

MORGAN-WOOTTON.—In Wheeling, W. Va., on Tuesday, December 18th, Dr. J. J. Morgan of Wheeling, and Miss Hilda May Wootton, of Pittsburgh, Pa.

Died.

BETZ.—In York, Pa., on Sunday, January 6th, Dr. Israel H. Betz, aged seventy-six years.

BLAKE.—In Herring, N. Y., on Tuesday, January 8th, Dr. George A. Blake, aged sixty-three years.

CUNLIFFE.—In Milwaukee, Wis., on Monday, January 7th, Dr. Robert A. Cunliffe, aged thirty-six years.

DARBY.—In Cleveland, Ohio, on Friday, January 4th, Dr. John Eaton Darby, aged eighty-three years.

GRIGSBY.—In Concordia, Kan., on Thursday, January 10th, Dr. Anna Colly-Grigsby, aged seventy years.

HENRY.—In Harmon, Ill., on Wednesday, January 9th, Dr. William Henry, aged eighty years.

HILL.—In Brewer, Me., on Friday, January 4th, Dr. Francis O. J. S. Hill, aged seventy-nine years.

HOWELL.—In Philadelphia, Pa., on Friday, January 11th, Dr. A. Alexander Howell, aged thirty-six years.

KRUG.—In Utica, N. Y., on Tuesday, January 8th, Dr. George A. Krug, aged sixty-six years.

LITTLE.—In Colbert, Ga., on Wednesday, January 9th, Dr. Samuel Boyd Little, aged forty-eight years.

LIVENGOOD.—In Elizabeth, N. J., on Friday, January 11th, Dr. Theodore F. Livengood, aged sixty-nine years.

MARTIN.—In Beaumont, Tex., on Saturday, January 5th, Dr. Glover D. Martin, aged forty-six years.

MILES.—In Merom, Ind., on Monday, January 7th, Dr. James Miles, aged fifty-one years.

NEALLEY.—In Pleasanton, Kan., on Friday, December 28th, Dr. George Nealley, aged seventy-six years.

NEWTON.—In Toledo, Ohio, on Monday, January 7th, Dr. George A. Newton, aged sixty-three years.

O'DONNELL.—In Paterson, N. J., on Sunday, January 6th, Dr. James O'Donnell, aged fifty years.

POLK.—In Minneapolis, Minn., on Thursday, January 3d, Dr. William R. Polk, aged sixty-three years.

RUMRILL.—In Randolph, Vt., on Sunday, January 6th, Dr. Clinton J. Rumrill, aged forty-seven years.

SMEAD.—In Newton, Ia., on Monday, January 7th, Dr. Carrol C. Smead, aged sixty-three years.

STORMS.—In Falconer, N. Y., Wednesday, January 9th, Dr. Ellis W. Storms, aged fifty years.

SPROUT.—In Bethlehem, Pa., on Wednesday, January 9th, Dr. Abram C. Stout, aged seventy-eight years.

SUMPMAN.—In Dahlgren, Va., on Thursday, January 10th, Dr. Herbert A. Sumpman, aged fifty-four years.

TAYLOR.—In Richmond, Va., on Monday, January 7th, Dr. Thomas James Taylor, aged eighty-one years.

THOMPSON.—In New York, N. Y., on Friday, January 11th, Dr. William Hanna Thompson, aged eighty-five years.

TIFFANY.—In Kansas City, Mo., on Friday, January 4th, Dr. Flavel B. Tiffany, aged seventy-three years.

WAGNER.—In Wampum, Pa., on Thursday, January 3d, Dr. Frederick M. Wagner, aged thirty-eight years.

WYCHE.—In Charlotte, N. C., on Saturday, January 5th, Dr. Allan A. Wyche.

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Original Communications

THE PRESENT STATUS OF THE CARREL SYSTEM IN THE TREATMENT OF WOUNDS OF WAR.*

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Before the world's greatest conflict was thirteen months old the chemiotherapeutic research work of Alexis Carrel, assisted by Henry D. Dakin, and made possible by the princely munificence of John D. Rockefeller, developed a surgical ritual which will do away with suppuration in hospitals. As our forbears paid the homage of their profound gratitude to Pasteur and Lister, so we today as a profession acknowledge our obligation to the patient investigators of Compiègne, who have given to humanity and the defenders of the right, a life-saving scientific masterpiece.

It is not within the plan of this paper to describe the method of making Dakin's solution, or the technic of the Carrel system of wound treatment; this has been ably done by many writers. You are all familiar with this system and how it was evolved by Carrel and his collaborators, after laborious and unremitting endeavor, before it reached its present perfection, and was presented to the Académie de Médecine, October 15, 1915. The literature is well known, and you know something of the cry that came from the trenches at the beginning of the war for some method that would prevent or control suppuration. You have all read with the keenest interest the later papers, notably by Doctor Lyle (1), surgeon in chief to Ambulance d'Annel, Oise, France, Dr. William O'Neill Sherman's two instructive articles (2 and 3), written after a sojourn of many months in Europe, and Colonel Barling's paper (4).

Those who have followed the medical literature of this great conflict can understand clearly the facts pointed out by McCrea and Klotz (5), how many new phases in the development of diseases have been demonstrated, as well as a number of conditions previously unknown to medical science. The very character of the trench warfare in a land polluted with the manure of ages, wet, cold, grimy, and unhealthy, has placed the brave soldiers under conditions which have heretofore been entirely un-

known to civil or military life. The resistance of these heroic souls in the presence of fatigue, shock, hemorrhage, and lacerations means much in measuring up the fight against inevitable infection, no matter what system is used in combatting it. True it is that when this great arena of war was entered there was no new method to heal the wounds of battle. Army surgeons were still clinging to experience, the old sheet anchor; in the language of Lyon Playfair, they were forgetful that the moulds in which that experience was cast were of antique shape, and ignorant that new currents with new conditions had swept away the sand which formerly held them fast.

The thought of a more potent antiseptic did not concern the surgeon, who made his incision with the clean scalpel and trusted to the Listerian idea with its modernized ritual. Tetanus, gas gangrene, and the streptococcus had no place in his peace time reflections. With the coming of war came also these foes, and to reckon with them adequately the search was instituted for a more dependable germicide. In the words of Le Conte (6), this weapon must fulfill two simple requirements: "It must kill all parasitic life, while causing no harm to any cell of the living body." If the writer were to attempt to redress the ideas of others which have been presented on this subject for your reflection and instruction, he might, in the language of Mrs. Humphry Ward, be guilty of a literary crime, for certainly to draw on the conceptions or phrases that have passed through the warm minting of another's brain could be so designated. The privilege has not been given to the writer to visit the fields of France and Belgium and there observe personally the work of Carrel and his coworkers, yet he has been permitted to read much that has been recorded of this epoch making advance in surgery and to have had personal communications and interviews with Lieutenant Colonel Clyde S. Ford, Dr. Charles L. Gibson, Dr. William O'Neill Sherman, Dr. H. H. M. Lyle and others who have closely followed and written of the work at Compiègne and Le Pan. Then too it was the writer's good fortune to receive instruction at first hand, from Doctor Carrel at the War Demonstration Hospital of the Rockefeller Institute for Medical Research in New York within the past month, who with rare genius is now demonstrating his matchless technic.

The Carrel antiseptic system consists in the in-

*Read before the Section in Surgery at the annual session of the West Virginia State Medical Association, October, 1917.

termittent instillation of a neutral solution of chlorinated soda, of definite concentration, distributed to the entire area of an infected wound. The wound is to be cleansed of devitalized, infected tissue, bone splinters, and foreign material, and hemostasis is to be absolute. The instillations are to be continued, until the periodical microscopic evidence, with a charted microbic curve, shows bacterial control and sterility. A few weeks ago this definition was personally submitted to Doctor Carrel by the writer, who preferred to define his system in the following well chosen words: "It is a combination of procedures, with surgical operation and mechanical cleansing, by which a chemical substance is used under specific conditions of contact, concentration, time and under bacteriological control, until a degree of asepsis is reached which allows the suturing or grafting of the wound. The chemical agent is only an instrument."

Carrel (7) has written that Dr. Henry D. Dakin, director of the Herter Laboratory, New York, was in charge of the laboratory established at Compiègne by the Rockefeller Foundation, and studied the action on tissues and microorganisms of many of the antiseptics old and new. More than 200 substances were examined by him, and he was led, for various reasons, to make chloramines (8), and by a special process, hypochlorite of soda (9). "Thanks to his excellent researches," Carrel writes, "we quickly had placed at our disposal substances endowed with feeble irritating qualities, with a toxicity for the organism almost nil, but of considerable bactericidal power. We then studied under what conditions these substances could sterilize a wound. These researches demonstrated that the microbes disappeared if the antiseptic remained in contact with the surface of the wound at a certain degree of concentration during a prolonged period. Bacteriological examination showed that infected wounds, treated according to these principles, became sterile. Thus quite simply, was realized what Sir Almroth Wright and modern surgeons consider to be impossible."

The writer's observation at the Rockefeller War Demonstration Hospital with Carrel, and our experience at the Ohio Valley General Hospital in Wheeling have been quite in accordance with Gerster (10) who summarizes, with emphasis, that the Dakin solution should be made up by a trained chemist who is able to assure the surgeon that it is neutral and contains between forty-five and fifty per cent. of free chlorine—the druggist is not equipped with the means for accurate titration for free chlorine and for acidity and alkalinity—and that the same strict asepsis must be maintained during each dressing after the bacterial count is low that one is accustomed to observe in performing a clean operation; if this is not done the granulating surfaces become inadvertently infected and the bacterial count rises again. The details of covering the skin with yellow vaselin, of arranging the tubes and glass manifolds, etc., are so well known in American literature that they need no more than mention here.

It is a well recognized fact that every innovation, each distinct scientific advance in medicine, has been invariably received with doubt and scepticism.

William Harvey was severely criticized and his great discovery was more than eleven years (1616-1628) gaining the indorsement and acceptance of his colleagues; indeed so hostile was the profession in England that he went all the way to Frankfort, Germany, to publish his thesis on the circulation. The same might be said of the work of Jenner, Pasteur, Lister, and Roux. With the inauguration of bacteriology and the presentation of the microorganism as the specific factor in our present day pathology, a veritable avalanche of protests came from every quarter, and scant consideration was given to the development of this revolutionary idea, blood red as it was with truth, because, forsooth, it meant the readjustment of the whole realm of medicine along broader and more intelligent lines. This same obstinate and obstructive attitude prevailed with the introduction of the Carrel system of wound treatment. Men of transcendent genius in our art, men usually with an open mind, in Europe and in our own country, men with a splendid balance of judgment, yet scientifically obstinate, turned their spines toward Compiègne, and refused to accept the new knowledge. One might have heard the sceptic say (11) that it often happens when a new Alaska is discovered there is a rush of tenderfeet to the new district, and it becomes difficult to extract from the mass of material presented the pure metal from the "fool's gold." How true it is, that every scientific discovery is the result of a natural process of development, which leads through more or less numerous errors and misconceptions to a definite and lasting result (12)! William O'Neill Sherman has said that as a result of this attitude, there were but six hospitals in Europe as late as September, 1916, using the Carrel treatment properly, notwithstanding its announcement a year before this time, and the failure to recognize and put this system into practice was responsible for the loss of many a limb and priceless life. To quote from Sherman: "It has been proved beyond any question of doubt that Carrel's (3) method of wound sterilization with Dakin's solution is a specific." Certain opponents of the Carrel method were willing to concede that infection could be shortened but were unwilling to concede its efficacy after infection had been fully established. In the review of the later literature of this subject one will find conflicting opinions. Kenneth Taylor, director of the Robert Walton Golet Research Fund, American Red Cross Hospital of Paris, makes this remarkable statement (13): "It is obvious from a study of the literature since the beginning of the war that the superiority of no one form of treatment has become firmly established. The treatment of infected wounds is thus still largely in the experimental stage." A visit to Compiègne in France or to the East Sixty-fourth Street War Hospital in New York, will dispel the doubt in this writer's mind. A. Charlier (14) admits that the Carrel system is a great step forward. Owing to the improvement of the immediate treatment of recent wounds, however, primary suture can very often be attempted with success. This author contends that "the good results obtained without Carrel's procedure are superior to those obtained with

it, because an immediate suture is evidently better than a secondary one." How the problem of primary suture of any considerable number of war wounds, as maintained by Charlier, can be taken seriously, it seems difficult to understand. Sherman (3), Colonel D'Arcy Power (15), of the Royal Army Medical Corps, and other writers, call attention to the fact that the battles of Belgium and northern France are conducted on fields that have been cultivated for centuries, the soil having been highly cultivated and enriched with the fecal material of man and animals for centuries. He describes how the clothing of the soldier is impregnated with mud and dust of this infected soil.

In the 1917 edition of the Practical Medicine Series, we find this reference (16): "All the testimony as to Dakin's fluid is not favorable, e. g., (17) M. Potherat remarks that it differs from Labarraque's solution only by the addition of boric acid, to neutralize the free alkali. There seems to be no reason why a different name should be given to the solution originated by the distinguished chemist. Besides the disinfecting action of Labarraque's solution has been known almost since its discovery in 1820." Carrel's method needs no defense, yet every intelligent and rational observer, who has seen the results attained by this master stroke of chemiotherapy, stands ready to challenge the sincerity of this statement, calculated, as it is, to confuse and bias the judgment of open minded students of surgery who read and study this ably edited annual.

Rutherford Morison (18), the author of the bismuth, iodoform and paraffin "bipp," asserts that he has mastered the situation, because "we have proved," he writes, "that septic wounds can be so treated as to require no tube drainage, that they can be closed by sutures so that, however deep and infected, they may heal by first intention, and that the dressings in all cases need not be changed for days or weeks." Despite the claims for "bipp," Morison's article is beautifully embellished in color with an illustration exhibiting the toxic effect of the bismuth about the teeth and mucous membranes, and he writes that "recovery in all of the cases has not been uneventful; in a few, symptoms strongly suggestive of iodoform and bismuth poisoning developed." Anderson (19) in comparing the Morison "bipp" with the Carrel-Dakin system asserts that the latter, made, as it is, of a very powerful antiseptic agent of high solubility, is so transitory in its action that it is necessary to renew it at short intervals. The advocates of the "bipp" treatment although mindful of the risk of toxic absorption seem to entirely overlook the time element in making their comparison, many of Morison's reported cases having been under observation from forty to ninety days, while these same wounded men under the Carrel treatment would be healed and well in one half the time.

In the light of all that has been written and said by Carrel and the exponents of his system regarding the microbic curve, bacterial control, and sterility in war wounds, it does seem strange that Morison (18) should go into print as late as April of last year with this statement: "The fact is that the bac-

teriology of wounds is so difficult a problem, that it has not yet been solved, and until it is, wound treatment cannot be so entirely controlled as it should be by scientific guidance." All such statements as these cannot but confuse the young army surgeon, who is seeking the light and guidance of those who are the teachers and pathfinders of our art and who, without prejudice, should impart truth and knowledge with an open mind.

My good friend, Lieutenant Colonel Clyde S. Ford, of the U. S. Army Corps, in a personal communication to me, from France, with his delightful and illuminating vocabulary has thus treated this controversy with a choice bit of satire: "Although such vicious jolts to latter day surgical beliefs must retard rational practice, there seems but little else for guileless and trusting adherents to do than to seek, momentarily, such security as may be found in their renewed efforts to sit tighter on the foundations of faith, until, by the work of these false prophets we shall know them. Discouraging as these phases of the present situation may be, there is still a balm in Gilead for our momentary despair in the token that the terminal reaches of other epochs of medical history have been frequently marked by the gaunt images of once proud figures who, having had the ill luck to look the wrong way, fall out of the procession to stand, as monuments of scientific admonition, in imperishable pillars of salt."

It is not the purpose of this paper to discuss the relative merits of the many methods that have arisen for the treatment of infected wounds. The controversy has been animated and each system has its ardent exponents. Sir Almroth Wright (20) has taken a definite stand and maintains unreservedly that antisepsis do not exert any effective action in the wound, either in extinguishing the infection or keeping down the bacterial growth. The usual procedure of inserting drainage tubes provides, in place of that continuous welling out from the lymph spaces to the exterior, which he holds is required, a drainage which rapidly arrests this process at the source; and in the ordinary treatment no steps are taken to disperse infiltration, accelerate separation of the sloughs, or bring antibacterial lymph or phagocytes to the infection. He insists on immobilization and if this vital step is omitted, states that there is the mechanical impulsion of microbes along the lymphatics and a consequent autoinoculation. Time will not permit entering into the rationale of this interesting theory, its lymphagogic activity, the drawing into the tissues of new blood lymph inimical to bacterial growth, the tryptic ferment, and coagulation inhibition claimed by the author. Moynihan (21) opposes this idea in these well chosen words: "I do not think Wright's method is applicable in the worst cases at least, for, as I have said, the condition of the soldiers who have received severe wounds, is one of exhaustion, with lowered blood pressure, cold extremities, feeble pulse, and marked pallor. A few of these patients need infusion before any remedial measures can be attempted, and very many suffer from shock in greater or less degree. The introduction of saline tailed in the wound would probably not cause any

outflow of serum, and, if it did it would be a most undesirable result, for fluid cannot be spared."

At a recent meeting of the General Medical Board of the Committee of National Defense at the Rockefeller War Hospital in New York, Doctor Carrel gave a brief but illuminating description of his technic and submitted convincing evidence of the efficiency of the system which bears his name, in dealing with the infected wounds of war. A comprehensive report of this meeting has been made by Dr. Franklin Martin to the State Committee, Medical Section, under date of August 23d. At this same meeting Doctor Le Conte, of Philadelphia, presented the claims of dichloramine-T, Dakin's latest antiseptic preparation, twenty times as powerful as the watery solution used in the Carrel method, dissolved in oil of eucalyptus and applied by a spray. The claim for superior merit was based on an experience of over 4,000 cases at the hands of Lea, of the Pennsylvania Hospital, and its entire junior staff, and Cummins, surgeon to the Midvale Steel Corporation. The new antiseptic is put on but once in twenty-four hours, seems efficient, is rapidly and easily applied, and accomplishes an enormous saving in dressings and surgical supplies. Sweet states, that in his base hospital now serving in France, thirty acute cases have frequently been dressed in ninety minutes, more than fifty per cent. of gauze and cotton has been saved, and that 186 wounds were dressed with 150 c. c. of the oily solution in all, these being bad cases of thigh and buttock wounds and compound fractures. Eight diphtheria carriers with positive cultures, sprayed three times with two per cent. dichloramine in twenty-four hours, gave negative cultures in the next three days. He further states that wounds which came clean have stayed clean, his tests having been made by attempts to grow smears on a culture medium. A complete report of Dakin's latest antiseptic will be found in the *Journal of the American Medical Association*, July 7, 1917, as presented to the American Surgical Association, in Boston last June.

In the original text of Doctor Le Conte's paper certain well known objections are made to the chlorine containing solutions, the claim being made that they are real obstacles to their general use. The paper dwells particularly upon the care with which the solutions are to be made, the necessity of always having a fresh preparation made daily, and the irritating effect on the skin. Yet the authors of this instructive paper report that the technic evolved at Compiègne and Le Pan minimize these objections if it is mastered and faithfully executed. Draper has somewhere expressed the opinion that what was written by Esdras near the willow fringed river of Babylon more than twenty-three centuries ago, still holds good: "As for Truth it endureth, always strong; it liveth and conquereth for evermore."

The testimony of some of those who, through observation and experience, have unreservedly accepted the truth of the Carrel system is interesting. With regard to the attitude of opposition at first, taken by the *Société de Chirurgie*, M. Pozzi's communication to the meeting of May 17, 1916, is worthy of reflection: "In any case one should see

for oneself at Compiègne, only two hours from Paris, the condition of the wounded treated by the new method. This is what I have already done myself on two occasions, when I took part in the memorable discussions which took place at the meetings of our society, January 5th and 26th, and at the *Académie de Médecine*, January 11th last. And it is what I have begged my colleagues to do at once. I am glad that M. Quenu has followed my advice. The time has come at last to repair the real injustice committed toward a method which for long months past had displayed in vain evidence of its value, which is destined to save in the future, as it has already done in the immediate past, a great number of wounded men, and to lessen in almost every case the gravity of mutilations and infirmities." In concluding his first paper, Sherman writes of the Carrel method as follows: "The great majority of wounds can be closed by suture and without suppuration. The stay of the wounded in the hospital and period of convalescence is greatly shortened and many now leave in four to six weeks, who would have required treatment from three to six months under former methods. All complications such as atrophies, ankyloses, adhesions, septicemia, and amputations are minimized; the mortality rate is also greatly reduced."

Professor Chutre, service of Gosse, gives us the report that he is now doing one amputation for sepsis and hemorrhage where formerly twenty were necessary, and there is but one death where formerly there were ten. Many cases which were labeled "Amputate on arrival" at the front have been saved from amputation by Chutre.

In his summary (1) Lyle says: "I believe that the adoption of this method is destined to save many lives, to reduce the gravity of the mutilations, and allow the rapid return to the front of many men who would otherwise be lost to the service of their country." J. C. A. Gerster (22) says: "There can be no doubt that the few men who actually follow every minute detail of this treatment have been able to obtain the same excellent results as its originators. It is the method of the future in traumatic surgery, in fact in the treatment of all suppurations." In another communication (10) Gerster writes: "The Carrel-Dakin method is all that its authors claim; if a surgeon fails to get consistently good results, the fault lies not with the method but with the man who is trying to carry it out." Colonel Barling (4), a most conservative English surgeon, has said that he has attained a measure of success with the Carrel system not secured by other methods. To insure the best results, Barling insists that the surgeon must not only educate himself in the details of this technic which have been carefully worked out, but must see that his nursing staff is well trained in the basic requirements; for every assistant must know that the Carrel system is no mere substitution for the routine surgical dressing.

The testimony coming from Carrel's hospital at Compiègne by the many American observers is convincing. Doctor Bryan (23), of Richmond, followed cases in every stage of healing and saw soldiers with devastating wounds from the time they were

received until their discharge. He also saw compound comminuted fractures of the thigh immobilized and irrigated with the Dakin solution, and inspected personally the resulting movable, soft, healthy scars from clean cicatrization, and the patient walking on the forty-fourth day. His observations included wounds involving the entire shoulder girdle with bone joint and soft part demolition, undergoing progressive repair and sterilization. Doctor Bryan writes: "The outcome was so bewildering, incomprehensible and at variance with our previous surgical ideas of wound sterilization and restoration, that Doctor Hawley and myself who were witnessing this incontestable illustration of the last word in surgical skill, were at a loss to say anything or even to discuss what we had seen." Major Chase (24), of Brooklyn, an officer in the French Army Medical Corps, says: "Probably every antiseptic known to man has been employed to moisten the dressings used in packing wounds, and personally I am satisfied that carefully prepared Dakin solution is the most efficient."

If any champion of the healing art within my hearing expects to cross the Atlantic to the blood stained fields of France in the service of his country, let him go with a profound conviction of the righteousness of our cause and with implicit faith that the God of Battles will strengthen the arm of him who fights for the right. May you take to the dressing tent, the casualty clearing station, or the base hospital, the fruits of these modest investigators, who claim no originality for this system of wound treatment, but rather feel that some new ideas have been cast into the mould of present day science; who have had no other motive than to mitigate human misery, and to repair the body broken by a brutal foe.

If the writer has aided in clearing the atmosphere caused by a storm of controversy; if in any little way we have aroused the interest of this section to a realization of its responsibility of teaching the medical men of this State the new faith; if your conviction has been strengthened to a knowledge that Carrel's weapon has shown more weight than any other arm in offensive action against the wounds of war, then there has been ample recompense for this effort.

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THE PSYCHOLOGICAL, PHYSIOLOGICAL, AND PHARMACOLOGICAL BASIS OF NICOTINISM, ALCOHOLISM, AND MORPHINISM.

By JAMES L. TRACY, M. D.,
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Sociological phenomena whether physical, mental, or both physical and mental always challenge careful medical analysis. Academically speaking, such phenomena originate either in progressive or in retrogressive instincts. The phenomenon of the prevailing enormous use of narcotics is representative of the workings of a powerful influence. That influence in its end results aids or antagonizes civilization's advance. The study of this race impelling instinct, the basis of the phenomena of general selfinflicted narcosis, is the object of this paper.

Psychology of narcosis.—Mankind does not come up out of the past without struggles. Not all of heredity is progressive, nor is it altogether retrogressive. There is more progression, but in mankind there must be, of course, some backward pull of an ignoble past. Progressive inheritance translates the stresses of life into terms of inspiration for harder work. Retrogressive instincts demand relief from the normal stimuli to better and more persistent effort. This demand is the pull of barbaric contentment. This inheritance weakness fails to see that the stresses of life, when rightly made use of, are the agencies, the only agencies that are beneficently and with unchanging aim bringing humanity from lower to higher levels of civilization's attainments. This instinct prompts mankind to seek freedom from care in some narcosis.

Manhood, more often than womanhood, thus quails before the offers of the glories of a worthy fight and in degenerate weakness seeks to hide through some narcotic from the disturbing things of life. Men do not in this way shirk responsibility because there are more and greater trials of courage in the male sphere of life; but it has come about in the order of march of civilization that Nature has made the female the more important and dependable factor. Nature has decreed that the human race shall move upward age by age, and ultimate victory has been intrusted to and incorporated into the powers of motherhood rather than in fatherhood. The hereditary weakness, the ancestral degeneracy yearning for a sense of freedom from care, is everywhere more male than female. It is truly a "call of the wild," the wild of ignoble past. It is the instinctive looking back of a courageless mentality to the scenes and place and time of some lower plane of living. Out of this weakness grow all forms of superstitious beliefs and practices. The loss to humanity from the cutting out through narcosis of the inspiration from full appreciation of the meaning of life's realities, is incalculably great. I shall not, however, discuss here the sociological and economic bearings of narcosis.

Physiology of narcosis.—It is impossible to think of courage or of cowardice without thinking about the nerve cell. It is assumed that worldwide addiction to the use of narcotics points to a universal

lack of will power. Then back of the cowardice that demands narcosis, there is, as a matter of course, a degenerate nerve cell. The riddle of psychophysiology is to tell which came over in heredity, the cowardly thought or the verveless nerve cell. The inheritance bridge between one age and the next seems to break down about as soon under one of the loads as under the other. Whichever the priority and dominance, the deplorable spectacle everywhere presents itself of a cringing mental imploring the nerve cell for quiet, and a disheartened nerve cell importuning the mental for help.

The argument of the courageless nerve cell is that evolution of opportunity has progressed more rapidly than the powers of the evolutionary nerve cell can possibly keep up with. The nerve cell that is lacking in stamina goes so far as to argue that its selfpreservation is dependent upon its protection, by some means, from the harassing consciousness of the drive and push and friction of evolution that is continually pressing upon it. The neuron lacks in will power. It is a will-less nerve cell. The decisions of a will-less nerve cell are, in the nature of things, practically unchangeable. Not all of the powers of the inherited nerve cell are cowardly, but no really courageous nerve cell ever asked for narcosis.

Narcosis.—Naturally enough, the nerve cell of retrogressive instincts and desires is readily and rapturously satisfied by the narcosis. Under the spell of the narcotic, the hitherto lack of positiveness of character changes, and the cell that was weak and undecided in the common trials of life becomes bold and defiant in defence of its use of the narcotic. The narcotized nerve cell quiets and soothes the fearful mind, and the mind coddles the nerve cell. To be thus lulled is but added weakness to both the incompetent mind and the impotent nerve cell. And after narcosis is on, the enervating contentment of the mind and of the neuron join as one in frenzied tumult against attempted interference with their peace.

This paper has to do with a hereditarily craved and invited narcosis, and not with the man behind the narcosis. It deals with the impulses of a sickly nerve cell combining with a feeble will power to form a mind. This mind, demoralized in the midst of the purposeful stress of life, is afraid to share in the dare of evolutionary struggle, and accepts instead a life among the dreamland pleasures held up by the enticements of a narcotic. It is not necessarily about a will and neuron that have completely divorced themselves from tasks of usefulness. Rather, it is about a mind and neuron that are staying in the evolutionary game, but which choose while fighting to be rendered oblivious to surroundings. They prefer to work as in a treadmill. They are still conscious of the persistence of life's facts. They know that as soon as the narcosis passes off, the facts will reappear to again trouble them. This accounts for the bitter fight that the beguiled will and the soothed nerve cell put up against interference with their comfort.

No study in the realm of scientific medicine is of more practical importance than is the study of the hereditary degeneracy that underlies the universal

dread of meeting the so called ills to which flesh is heir. This dread of reality in some people tries to hide behind the ecstatic state of mind that denies the existence of disease. To this hysteroparanoia there are no acknowledged stresses of life, and so the victim professes to see about him only the pleasant and beautiful. The setting up in the mind of the illusions and delusions and hallucinations of such mental demoralization is a still deeper hurt to the mind than is the setting up of the dreamland pictures of the narcosis. The idiotic grin of ecstatic insanity seems, too, to be even more out of place among the worth while things of life, than does the contented, indifferent face of narcotic intoxication. It is possible that the same internal secretory derangements may be present in each class of cases, but here the discussion is only of the dethronement of the mind by the use of narcotics.

Psychical pharmacology of nicotinism.—Of the three principal narcotics used in this country, nicotine for several reasons leads in popularity. One of these reasons is that nicotine most quickly satisfies the longings of the storm tossed mental and of the inept neuron. Tolstoi said that after the first whiff from his pipe he no longer felt conscience. To be able to banish care is, to a jaded mentality, the one supreme requirement of a narcotic. Nicotine exalts the ego. The nicotine enthused and flattered ego feels like advertising its way of taking a narcotic. The user actually feels that everybody likes, or at least ought to like, everything that goes with his use of nicotine. To him it is entirely unbelievable that a sane person can object to any feature of its use that he presents. The grandeur intoxication prompts the customary good natured obtrusion of the practices of nicotinism into the presence of others. As care flies away in the intoxication, there comes in its stead a feeling of being at peace with the world. The narcosis grants the peace, but the condition of peace always is that the use of nicotine is not to be interfered with. Because the narcotic effect is upon the ego itself, inflating ideas as to personal estimation of the meaning of the intoxication and resentment to any and all criticism of nicotine are very acute.

The reactions of public opinion to these features of the narcosis are favorable to the public use of nicotine. This accords with the psychological law, that the mind is likely to be captivated by that which presents a bold front of assumed sincerity. Public opinion does not give the matter study before it sanctions the public use of nicotine, but the use forces itself upon the public, and as nonendorsement of the narcotic act means a fight, the peace loving instinct in man surrenders to nicotine. The medical matter involved is that the end results of nicotine narcosis are never as good as the nonnarcotized man would have been capable of. Besides, its use violates every principle of scientific medicine.

Psychical pharmacology of alcoholism.—Alcohol in popularity is second on the list of the three narcotics studied. Alcohol may almost be said, though, to be the first thought of degeneracy weakness. It has the psychical handicap, however, that its narcosis carries with it some degree of sense of shame for having used alcohol. Alcoholic narcosis sug-

gests the desirability of screens while drinking and the use of aromatics to disguise the alcoholic odors on the breath. The ego feels humiliated. In a degree, alcoholic intoxication is self-condemnatory, cowardly. Public opinion will fight such a narcosis. Alcohol loses in popularity as a narcotic because of this psychical effect of the narcosis upon the user.

The person feeling the effects of alcohol is somewhat conscious of his loss of inhibition of the baser instincts and blames himself accordingly. Because of this apparent exhibition of unworthiness, more than because of the sociological disgrace of the acts and facts of the narcosis, alcoholism gets into disfavor with public opinion. Alcohol does not force the acts of drinking into the privacies of the others, and indeed it is only through unavoidable display that the user of alcohol makes known his habit. Alcohol supplies a felt want in all classes of people. It is solace alike to the educated man and to the illiterate. The narcosis is of the same neuron in all grades of mentality, but necessarily the intoxication is at different intellectual levels. The one common desire in all users of alcohol is to be made oblivious to the distressing things of life. Alcohol does it. Anything between mere longing for companionship and the extreme experience of deepest disappointment may be the distressing thing from which relief is sought—the same stresses of life, the same weak mental, the same lack of moral courage, and the same solace. Too great poverty in one case, and too great wealth in another, and alcohol meets the demands. As has been said, that which determines whether public opinion commends or condemns the public use of a narcotic, is the psychical effect upon the public of the spirit, so to speak, of the narcosis. The apologetic aspect of alcoholic intoxication makes for unpopularity.

Psychical pharmacology of morphinism.—Morphine narcosis is one of the most cowardly of intoxications. The will-less victim all the while wants to free himself from the habit. Popular opinion damns morphinism because of the humiliation front that the narcosis presents. That which accepts morphine in lieu of the inspiration of honorable life warfare is an inheritance cell weakness. At any rate it is a weakness inherent in humanity. Morphine seduces the weak will, but the seduction is a craving for seduction. The unstable neuron is a product of the past. It is the product of progressive and retrogressive forces. The cell is representative of all it has passed through. The presence and fact of the cell demonstrates that it contains more of life than of death. Morphine caters to the death part of the cell. Public opinion prefers life to death and condemns morphinism because it slinks and cowers. Public opinion does not oppose morphinism because of the commonly proved and known fact that morphine using is radically injurious both physically and mentally. The psychology of the opposition is: 1. It makes the victim an object of contempt both consciously to himself and to others. 2. It requires no courage to fight morphinism. There is no "come-back" from criticism. 3. The public sees so little of the use of morphine, that opinion is normally sensitive regarding the physical, mental, and sociological outrage of the use of a narcotic. If

on the other hand one can sanely entertain the idea that some kind of narcotic is an evolutionary necessity, then public opinion is wrong in its judgment that condemns morphinism. This is so, because judged by the standard of values of the basic principles of ethics and esthetics, of hygiene and sanitation, and of physiology and psychology morphine is the queen of narcotics. For instance, morphinism does not disfigure the face with a pipe, nor does it blow smoke from mouth and nostrils. It does not obtrude its use into the privacies of others. It does not pollute the air that others must breathe. It does not spit or vomit or commit other nuisances upon the streets. Its physiological and psychological effects are not more detrimental to general usefulness, than are the effects of other narcotics. It is not more costly and its victims are not greater burdens upon the community than are other addicts. Obviously one important step in the study of the basis for the prevalent open use of narcotics is the study of public opinion. Public opinion reacts along the line of least resistance. Public opinion here follows the course that the same weakness in the individual follows, when the man surrenders to the enticements of the narcotic.

Submitted propositions.—The general open public use of some form of narcotic is a matter that demands serious medical consideration. The use of narcotics has its origin in the retrogressive cowardly instincts that are ever coming up with man out of the past.

The other basis for the public use of any narcotic is in the voice of public opinion.

The public use of narcotics represents the intelligence and moral level of public opinion, but the commendation or the condemnation of a narcotic by public opinion does not in the least affect the workings of physiological laws.

WEST WOODRUFF AVENUE AND SCHOOL PLACE.

POSTOPERATIVE TETANUS.

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Perhaps the most insidious infection following operations is that caused by the tetanus bacillus, producing the condition known as postoperative tetanus. The germ performs its work stealthily and surely without the slightest warning. Many complications following operations can be foretold, while many too numerous to mention here are thrust upon the surgeon. At times the most complicated intraabdominal conditions are followed by a speedy recovery, again after the simplest aseptic operations unlooked for emergencies arise. Postoperative tetanus occurs usually after aseptic operations. It is lethal in the great majority of cases. The symptoms of postoperative tetanus are similar to those of tetanus acquired in other ways. The first symptom that the surgeon encounters eight days to two weeks after an operation is stiffness of the lower jaw; this increases in intensity and is followed very soon by convulsions of varying severity.

The two cases which I had the opportunity to ob-

serve occurred in different hospitals. In the Jewish Hospital it was the first case that occurred there according to the records of that institution and the first seen by Dr. W. H. Teller who did a Cæsarean section on the patient. The period of incubation was six days; the source of infection was never fully determined. The case ended fatally in twenty-four hours, the convulsions being almost continuous notwithstanding huge doses of antitoxin. Infected catgut was excluded as a cause, as several operations had been performed on that day and the same gut had been used. The other case which was referred to me after operation occurred in the service of Dr. S. E. Tracy at the Lebanon Hospital. Hysterectomy was performed in this instance and stiffness of the jaws appeared eight days after the operation. The jaws finally became tightly locked, convulsions ensued, and death took place three days after the onset of symptoms. Intraspinal and subcutaneous injections of antitoxin were used but without avail. Bacteriological examinations of the catgut revealed no growth. The same kind of gut was used on other cases before and after the appearance of this case without, I am happy to say, any tetanus.

It is interesting to note the opinions of the various authors and surgeons concerning the predisposing causes of postoperative tetanus. The majority subscribe to the theory that the tetanus bacilli remain dormant, but require some mechanical factor to activate the germs. Catgut receives its share of blame but not so much as might be expected. When one considers the extreme care now taken in the preparation of the gut one can hardly conceive it to be a cause. Nevertheless it must always be held under suspicion whenever a case arises and specimens should be sent to the laboratory for examination. The theory that the tetanus bacilli may remain dormant may be a confession of ignorance on the part of the physician but bacteriological evidence reveals the fact that the tissues, sutures, dressings, water, etc., are usually negative. The opinions of the various authors and the cases reported by them follow.

Barling (1) reports two cases. One was a male child ten years old operated on for tubercular adenitis. Tetanus developed on the twelfth day and the child died six days afterward. The other case was a female, aged thirty-five years. Her breast was amputated. Tetanus developed on the fourteenth day. The patient died on the eleventh day of the disease. Antitoxin was used without avail. Barling excludes catgut and cannot trace the source of infection to anything definite. Bessel (2) reported two cases following clean abdominal operations. A female was operated on for proclitidia for which a D. and C. and Alexander were performed. On the fourth day both wounds were united without rise in temperature. On the fourteenth day trismus and the symptoms of tetanus developed and the patient died in two weeks after the administration of chloral, bromides, and physostigma. The second case was an hysterectomy performed for fibroids. On the ninth day trismus developed, examination showed the wound to be in good condition without local tenderness. Antitoxin was given but

the patient died in twenty-four hours. Bessel suggested as cause, first, a want of proper disinfection, and second, a preceding exposure in which the bacillus gained entrance into the body and remained inactive until excited by the trauma of the operation. He does not mention catgut at all. The first supposition he disposes of by stating that other operations were performed by other members of the staff and himself in which tetanus did not develop. He inclines toward the second theory that the bacilli remain dormant. He mentions several cases of Kopoci, Cheeseman, and Dupuytren in which the tetanus bacillus was introduced some time before operation. The slightest operative procedure develops tetanus. In Dupuytren's case a piece of whip was imbedded in an old scar several months prior to an operation after which the patient developed tetanus.

J. Brettauer (3) reports a case of supravaginal hysterectomy performed for fibroids. The appendix was removed. On the twelfth day tetanus developed and the patient died two days after its onset. He excludes catgut as a cause because other cases were operated on the same day, the same make of gut having been used. He believes the tetanus bacilli are in the intestinal tract prior to operation and by the removal of the appendix infection and toxins gain entrance into the blood. Campbell (4) mentions a case of tetanus developing twenty-one days after an operation for hernia in a farmer. Cultures of the suture material was negative. It was thought in this case that the occupation of the patient exposed him to the tetanus bacilli. He received antitoxin and recovered. W. B. Dorsett (5) reports two cases, both women, in whom a ventrofixation of the uterus was done. In one tetanus developed four days after the operation and the patient died on the third day. In the other tetanus developed five days after operation and the patient died. The bacteriological findings in these cases are interesting. In the first case an emulsion was made of the skin scab and injected into a mouse; it died of tetanus. The organism was recovered from the dead animal. Scrapings from the fingernail were made but the animal did not acquire tetanus. In the second case the suture material was examined, an emulsion made and injected into a mouse which died of tetanus. Examination of the stock material was negative, but in the two cases where kangaroo tendon was used spores of the tetanus bacilli were found. Dorsett believes the kangaroo tendon was the source of infection in these cases. Personally I have not used kangaroo tendon for the past ten years on account of the great difficulty at that time to get a sterile gut of this character.

Flaherty (6) reports a case of hemorrhoids in which the clamp and cautery method was used; tetanus developed the third day after operation. No ligatures were used. The patient, who was sixty-two years old, died on the seventh day. Antitoxin and drugs were used without avail. This author believes the source of infection from the injection of some material in the hemorrhoids by rectal specialists a few days prior to the hemorrhoidectomy. Jacobson (7) in a paper on serum therapy reports five cases of tetanus following operation, four being

for the removal of the appendix in the quiescent stage. He ascribes the cause of tetanus to bacilli lying dormant in the intestinal tract and quotes Pizzini as having found them in the feces of man. Gum (8) made some experiments to arrive at the cause of postoperative tetanus. He examined fifty samples of soil in England and twenty-seven showed tetanus. He believes the bacilli remain local; the toxin spreads along the nerve trunks; toxalbumin is eliminated in the urine and if the latter is injected in the mouse it acquires tetanus. This is a good early sign.

He reports four cases: 1. A woman operated on for carcinoma of the bowel had a convulsion a day before the operation. On the eighth day after operation she had spasms of the muscles of the neck and general convulsions. Discharges of the wound were negative for tetanus bacilli. Post mortem some hemorrhages were found in the pons. Cultures from the fluids of the body were negative. Gum believes this case to be a doubtful one. 2. One month later a woman was operated on for double pyosalpinx; trismus developed on the sixth day. There were no general convulsions. She died on the eighth day. Examinations of the fluids were negative for tetanus bacilli. 3. A woman was operated on for a malignant tumor of the ovary. On the thirteenth day trismus developed and then general convulsions; the patient died in forty-eight hours. Catgut was suspected but the responsibility was not definitely proved. 4. Five weeks after ovariectomy was performed in the third case with "aseptic care." Tetanus developed on the tenth day and the patient died three days after the symptoms appeared. Special care was taken in the preparation of the catgut. Gum was inclined to believe that the original source was in enameled tinware which was packed in straw. There seemed to be no special reason to blame catgut for the sudden appearance of tetanus. Gum tried to trace the cause of the four cases as follows: 1. Operating room: cultures taken from the walls were negative. 2. Air: negative for cultures. 3. Dressings and sponges: anthrax bacilli were placed in sponges and the sponges were sterilized under the usual hospital régime. Cultures from the dressings were negative. 4. Sister in operating room was excluded, having assisted in other operations the same day. 5. Catgut was excluded by the author as the same kind of gut was used in other hospitals and no case developed. 6. Water seemed the plausible cause to the author. Examination of the water was negative for tetanus bacilli but the soil which the water received as drainage was positive. However, tetanus did not develop in wounds treated with the water supply without antiseptics to kill the tetanus bacilli and again many other hospitals received the same water supply. Examination of the cistern of the hospital revealed several red looking fungoid bodies, but examination for tetanus bacilli was negative. The cistern was removed and of 130 cases operated on since none acquired tetanus.

L. J. Hammond (9) reports a case following double salpingectomy. Tetanus developed six days after operation and the patient died twenty-seven hours after the onset of symptoms. The author be-

lieves that since the period of incubation is nine to twenty-one days the germ could not have been introduced at the time of operation; that the infection probably came from the mouth is the explanation of Dr. J. Sailor who was called in consultation. One million units of antitoxin were given. Doctor Hammond reviews Doctor Coe's two cases in which the water was probably the source of infection. It contained large numbers of tetanus bacilli. The water used for operations was boiled one hour. Dr. B. C. Hirst tells of a few cases of tetanus developing post partum due to douching, the water evidently containing tetanus bacilli. Ovariectomy was performed on a patient aged thirty-one years by S. I. Jaffe (10). The wound healed by first intention. On the eighth day tetanus developed and the patient died in thirty hours. Cerebrospinal fluid was negative. The Clinical Research Association, of London, reported that several varieties of sporing bacilli, including aerobic as well as anaerobic organisms, were obtained from the various samples and in only one sample was there an organism having the characters of the tetanus bacillus. No animal inoculation was made.

M. M. Lusen (11) operated on a cook aged twenty-one years for tubercular peritonitis, the original focus being in the tubes. On the sixth day stiffness of the jaws developed. Symptoms of a beginning tuberculous meningitis were first suspected, but later the diagnosis of tetanus was apparent. The wound was clean but was reopened; cultures from the wound were negative. The patient died in thirty-four hours. The author does not conclude that because the cultures of the wound were negative, the tetanus bacilli were absent; few bacilli may be present and throw off a great deal of toxin. He is inclined to follow the teachings of Matas, who believes that the origin is in the intestinal canal and that the organisms gain entrance into the body with uncooked vegetables, such as celery, lettuce, cabbage, etc. He realizes that the normal defences in healthy individuals amply protect them even though the tetanus bacilli are introduced in large numbers. The only way in which to account for the great numbers of patients who survive operations performed in fecal contaminated areas is that the anaerobic character of tetanus bacilli plus the protective influences of the body largely neutralize the virulent infections of the alimentary canal. He follows Matas in prophylactic treatment with purgatives and three or four days before operation withholding of all raw and uncooked vegetables, as garden vegetables and fruit, and in emergency cases giving 1,000 units tetanus antitoxin.

Rudolph Matas (12) points out that in two of his cases the patients ate largely of uncooked vegetables twenty-four or thirty-six hours before operation. The vegetables and fruits of the group in which the laboratory has frequently found tetanus bacilli and their spores includes celery, lettuce, chicory, water cress, cabbage, radishes, turnips, carrots, tomatoes, strawberries, and blackberries. Matas and others have noted the liability of tetanus in operations around the rectum and genital and lower pelvic regions. The occasional postoperative death due to tetanus with competent and clean surgeons points to

other sources of infection than poor technic or contaminated material. Matas also observes that it is a well known fact that tetanus bacilli live in the intestinal tract of herbivorous animals, such as the horse and cow. It has been proved that the organism resists the digestive juices but the feces of animals in contact with open wounds of the same animal will cause tetanus.

Pizzini has pointed out that five per cent. of all normal men harbor the tetanus bacilli or its spores in the active state in the intestinal canal and the percentage of contamination is increased in individuals working as hostlers, stablemen, dairymen, drivers, etc. The author urges prophylactic treatment, in cases to be operated about the possible contaminated regions, which consists of purgation three days before operation and the forbidding of all raw uncooked vegetables, berries, etc., for the same period of time before operation. In emergencies where dietetic precautionary measures are impossible tetanus antitoxin is injected subcutaneously while the patient is under the anesthetic.

W. G. Richardson (13) reports two cases. One, a woman operated on for gallstones, died in forty-eight hours, catgut being used throughout except for the skin, in which silkworm gut was used. Catgut was cultured and found negative. The other case was a man operated on for strangulated hernia; he left the hospital in two weeks and returned a week later with symptoms of tetanus and died in forty-eight hours. The cause could not be definitely ascertained. Richardson collected twenty-one cases, twenty occurring in three and one half years. In fourteen of these cases bacteriological study was made and in four cases a bacillus resembling tetanus was cultivated from the catgut, but no animal died of tetanus after inoculation of the cultures. Richardson quotes Professor Hamilton, who has observed a disease in sheep called "louping ill" or "trembling," which resembles tetanus in all its manifestations. Hamilton further makes a pertinent deduction that since the catgut we use is taken from sheep, the disease may not be tetanus at all but "louping ill." The organism found in louping ill is also a rod shaped bacillus. It is difficult to distinguish this bacillus from the true tetanus bacillus. He also shows that the bacilli resembling those of tetanus were found in the remnants of catgut used for ligatures in four cases. He suggests that the disease we call tetanus is not tetanus at all but one of the sheep diseases. He maintains that the disturbance caused by the operation upon the peritoneal cavity favors the activity of the bacilli which are dormant in the individual and would not have occurred had the operation not been performed.

Curious as to the frequency of postoperative tetanus the author sent a questionnaire to 100 active and retired surgeons to determine its prevalence. Fifty-two answers were received and out of these sixteen surgeons reported twenty-four cases of postoperative tetanus. Only three patients out of twenty-four recovered. Dr. B. C. Hirst had five cases following abortion and douching. All these patients died. I have not included these in the twenty-four above mentioned. They are of interest because catgut was not used in any of these

cases. A prominent gynecologist of Baltimore reported in answer to the questionnaire: "I do abdominal surgery and have no experience with tetanus." It is a remarkable fact, however, that operations in the lower abdominal region are followed by more tetanus than any other region of the abdomen operated upon. In one series out of twenty-four cases of postoperative tetanus eleven followed gynecological procedures, ten followed other abdominal operations, and three supervened on operation remote from the abdomen. In another series of twenty-four cases postoperative tetanus followed twelve gynecological operations, five operations performed for other abdominal conditions, and seven operations for miscellaneous conditions. The questionnaire elicited some interesting information. It has been stated that tetanus is particularly common after operations on the rectum. This is not borne out by the cases reported or in the answers received from three prominent proctologists who have never had a case. A fourth proctologist had one case. In the above series four were hemorrhoids and one was anorectal fistula. The Mayo Clinic reports that they have never had a case and the same may be said of a large number of operators doing the bulk of the surgery in this country.

CONCLUSIONS.

1. The individual may possess an inherent tendency or predisposition to tetanus.
2. Germs may be introduced before operation in a susceptible individual and lie dormant, but a stimulus is required to render them active.
3. Infection is by accidental contact with germ laden soil before or after operation.
4. Catgut is probably excluded as a causative factor.
5. Water may be a cause of infection. Five cases reported by Dr. B. C. Hirst followed douches after the puerperium and abortions. These were not included in the series above as they did not follow operations.
6. The ingestion of raw vegetables should not be permitted before operation.
7. While purgation before operation is not essential, as evidenced by the great numbers of operations done without a physic, still on account of the susceptibility of some individuals to the tetanus bacilli laxatives ought to be used before operation except in emergency cases.
8. Special care should be taken in the preparation of farmers for operation, and others engaged in raising products of the soil, which includes many at the present time, also workers around stables, etc. An immunizing dose of tetanus antitoxin should be given in these cases, as has been recommended.
9. It is a remarkable fact that most of the cases of postoperative tetanus have followed gynecological operations.
10. Further study should be made of the similarity of "louping ill" of sheep and tetanus.

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1427 BROAD STREET.

NONSURGICAL TREATMENT OF CANCER.

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It is very gratifying to notice that physical therapy is at last invading the field of cancer treatment. Slowly but surely it is dawning upon medical minds that the cancer *per se*, that is the mere tumor mass, is a negligible factor in the mortality rate.

Tumors of much larger size seem from an anatomical point of view to encroach severely upon neighboring tissue, yet in spite of all this they are considered benign. Frequently they are removed merely for cosmetic reasons, seldom or never because they endanger the life of the patient.

The case is different with cancer or other malignant growths. Even a small growth is liable to cause death. Wherein then lies the difference? Not being able to find a difference in the anatomy it must be in the physiology of the mass.

Each individual cell has two physiological functions, one intended for the continuation of its own existence, the other, a community function which is intended to benefit the organism as a whole. There is no doubt as to the performance of the first function; the cancer cell lives, thrives, and multiplies and is not particularly detrimental to the individual. With the second or community function there seems to be something radically wrong. Instead of benefiting the organism as a whole, it injures it. The cancer patient loses weight and becomes cachectic, metastasis occurs and the patient dies. Such a function was certainly not intended by Nature.

The question presents itself: Do these cells possess a peculiar power, not possessed or shared by other cells? A cancer cell does not differ anatomically from any other cell. It does differ in its location and arrangement. The cancer cells are where they ought not to be. Endothelial cells are located where only epithelial cells should be. Thousands of a certain kind of epithelial cells are where there ought to be only a very limited number. They are out of place; they are not in harmony with their surroundings; they neither assist nor are they assisted by neighboring cells in the performance of that dual physiological function which is the inherent property of every living cell.

The cancer cell therefore, ostracized by its neighboring cells, is compelled to perform a physiological function which is completely out of harmony with the system as a whole. The results of the metabolism of the cancer cell is discharged into the lymphatics which are poisoned thereby, causing a retention of the "cancer juice" with metastasis and more poison. This continued poisoning causes interference with other vital physiological functions and finally the death of the individual.

Shall the cancerous growth be removed surgically? No matter how that question is answered or who answers it, a serious responsibility is assumed. "All the vast researches into the cause and the cure of cancer have thus far yielded neither an adequate explanation of its primary cause, nor a specific cure. Until that specific cure is discovered, therefore, the one and only method of prevention is the removal of the precancerous condition" (1). "It has long been a recognized fact that the majority of benign tumors may sooner or later be invaded by cancer or may undergo cancerous degeneration. This is notably true of most of the various forms of tumor of the breast. . . . the lesson to be learned from this is, that every benign tumor of the breast should be removed before it has an opportunity to become carcinomatous" (2). Dr. I. H. Jacobson (3) gives the following figures: number of operations, 1,280; primary mortality, 19.53 per cent.; cures, five years, twenty-five per cent.; absolute cures, 16.52 per cent. "Cancer is not a surgical disease, although of late years cases of this nature have been almost always relegated to the surgeon. . . . The blood in advancing cancer has repeatedly shown to exhibit many manifest changes, which indicate vital alterations in the actions of the organs which form the blood, and so control the nutrition of the body and its cells" (4).

"What is the real problem of cancer? Surely it is not to increase the surgical activity, which has resulted only in a steadily ascending scale of mortality, which in reality is greater than that observed in any other malady! For the increase in the death rate from cancer throughout the United States from 1900 to the present time has been coincident with the greatest activity both in laboratory research and in the advanced surgery of the disease. I repeat, is it not time for us to stop and consider whether our laboratory work with the microscope on morbid tissues, and our experimentation on rats and mice are truly serving to solve the real problem of cancer? Had we not better turn our attention to human beings, and by careful clinical study of our patients discover where the fundamental error lies, which first induces the formation of an aberrant cell mass, which we call cancer, and then continually feeds it by the same deranged blood stream, so that it becomes utterly uncontrollable and invades and destroys other tissues; while at the same time the anemia, pernicious and progressive in character, gradually saps the life of the patient, to a lethal end? Repeated and most careful laboratory studies have demonstrated great and significant changes in the blood in cancer. I hope to satisfy you that the mass which is excised is only the product of a far deeper systemic change, which has probably already produced other, more or less similar, masses or deposits elsewhere, in the bones and internal organs or lymphatics. So that surgical removal of the one often stimulates the development of others" (5).

During the last few years a great change has come over the minds of the medical profession. Cancer cure statistics are anything but gratifying. The best that can be reported from a surgical point of view is sixteen per cent. When we take into con-

sideration the fact that among these permanent cures may have been cases of the "precancerous condition" we have a right to wonder whether or not the patients would have perhaps lived longer without than with the operation. The medical profession has awakened to the fact that even the removal of a small piece for microscopic examination is fraught with serious danger. As a rule, by the time that a growth can be demonstrated to be malignant, the lesion has ceased to be a local one and it is constitutional. Hence, when such cases are operated upon at this stage we have only 16.52 per cent. of real cures.

There is something contained in that tumor mass that is toxic. As long as this toxic material under a normal course of events finds its way gradually into the nearby or even distant lymphatics, so long is the body as a whole more or less capable of neutralizing the poison. At least the system accommodates itself as long as it can to the presence of the toxin. Just as soon as previously unused avenues are opened with the knife for the absorption of the "cancer juice," metastases are apt to follow. For that reason the surgeon attempts to find safety in the radical operation, by cutting far and wide from the real growth. Even this radical operation, much better than the mere removal of the tumors, nevertheless is not all that could be desired. It is necessary to get away from the cutting process entirely.

T. C. S. Taliaferro (6) states that he follows the technic of Doctor Percy, which is as follows: The abdomen is opened and a low degree of heat used; it should be kept in position until the whole mass contiguous to the heating iron is made so hot that it cannot be held in the surgeon's hand when encased in a medium rubber glove. The author believes that carcinoma of the cervix, when not too far advanced, can be cured by this method. We see here that the mere opening of the abdomen or the cutting where there is no cancerous involvement does not injure the patient. It is upon this same theory that the radical operation is based. The cancerous area must not be made to bleed; it is better to burn it away.

In all of these operations cancer has been looked upon as a local disease. I am in hearty accord with Doctor Bulkley and believe that when the diagnosis of cancer is established, it is too late for local surgical interference. Such an interference may under suitable circumstances be cosmetic even palliative but seldom curative. Since 1910 I have treated all kinds of malignant growths, at least so diagnosed by competent observers, by the application of the diathermic current (7).

In cancers upon the surface of the body and all of the cancers in the accessible cavities I have employed a current which causes the parts to maintain for one hour daily a temperature of 108° F. Such a temperature in the cancerous mass changes the physiological workings. Cachexia disappears; the patient gains in weight. Sometimes the tumor mass disappears entirely, sometimes it simply becomes smaller. All of my early patients are alive, they have not been mutilated, they are not now aware of the usual consequences which always accompany malignant growths. The only drawback so far of this method is that it is not applicable to any of the

internal growths. As long as the growth is so situated that contact can be maintained with at least one of the electrodes, there is every reason for expecting good results. Of all the normal cavities, cancers of the mouth are the least favorable on account of the mechanical difficulties to be overcome. Cancer of the breast has responded best when the growth could be enclosed between the two electrodes.

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301 WEST NINETY-FIRST STREET.

AN ANALYSIS OF SEVEN CASES OF FRIEDREICH'S ATAXIA.

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CASE I.—R. C., age fourteen, born in this country of Russian parents, was referred to the Neurological Department of the Vanderbilt Clinic from the Orthopedic Department, where she had been under treatment for some time for a scoliosis. A careful and repeated inquiry into the family history failed to disclose any familial or hereditary incidence of a similar malady. The patient was one of a family of four children, the other three being perfectly normal, not awkward nor in any way deficient in their muscular or coordinating mechanisms.

This patient had always been delicate, thin, too tall for her age, and ungainly and awkward in the performance of even ordinary acts. Despite the fact that the onset of her condition was not recognized until the scoliosis became glaringly prominent, the mother recalled that the girl was always extremely awkward. She stumbled often, dropped things easily, and was not at all graceful either in walking, sitting, or doing ordinary things that children of her age usually do with a fair amount of speed and accuracy. However, nothing was suspected until one day about six months ago, when the mother was giving her a bath, she noticed a marked deformity of the spine, for which condition the patient was taken to the Vanderbilt Clinic. It will be noted that the child had never, although almost fourteen years of age, been able to bathe herself without assistance, either in dressing or undressing herself, or in being lifted in and out of the tub. After treating the child by various orthopedic and general medical methods, it was considered that a possible neurological condition existed, and she was referred for diagnosis. A number of x rays were taken in the orthopedic department which disclosed no disease or deformity of the spine apart from the double scoliosis, the lower curve being to the right and the upper one to the left. The child did well at school and had never been demoted or left back in her classes. She always gave her teachers the impression that she was lazy and languid, and never could be made to sit up straight like other children. She always seemed to be ready to "flop" in any direction.

Inspection showed a child unusually tall for her age, five feet four inches in height, and weighing only eighty-five pounds. She was not fleshy at any point, wasting being evenly distributed throughout the body. All limbs and trunk were equally affected. The eyes stood out prominently, although the thyroid did not appear enlarged either on inspection or palpation. There was an internal strabismus in the left eye, due to a weakness of the external rectus. Both big toes were abnormally large, the first phalanx being hyperextended and the distal phalanx

flexed. When the patient stood there was evidence of great general relaxation in both feet, and instead of the contracture, or *pes cavus*, there was a *pes planus*, which immediately disappeared as soon as the patient sat, the arch of the foot remaining distinct if the patient did not walk or stand. There was a slight, irregular, nonrhythmic, nystagmoid movement in both eyes; this movement was not always present and could be best brought out when the patient looked upward.

In respect to coordination, both equilibratory and non-equilibratory ataxia were present in the finger nose and finger finger tests. The ataxic movements were also present in both lower limbs, as brought out by the knee to heel to toe test. There was a distinct unsteadiness when the child stood with her eyes open or closed. The child walked on a wide base, unsteadily and very awkwardly. She was uncertain in her movements, and together with this, there was a certain degree of weakness which made itself seen in the slowness of her gait and in the lack of springiness. Fournier's tests were poorly performed. The speech was not impaired, but all motor skilled acts with upper and lower extremities were awkwardly done. The child did not play the usual games that a child of her age plays because she realized that she could not do them well. She did not swim or dance or jump the rope, and did not play any musical instrument. All deep tendon reflexes were much diminished, particularly the patellars, which could be elicited only after great difficulty. They were, however, equal. The pupillary reflexes were normal and the superficial reflexes were promptly elicited and equal. There was no clonus and on several occasions we were able to elicit a Babinski response on both sides. This, however, could not be done every time for some reason. None of the modifications of the Babinski were elicited except occasionally the Chaddock response. There was great muscle weakness, which was undoubtedly responsible for the *pes planus* and for the deformity of the spine. The child stood stooped and round shouldered and sprawled in her chair, not being able to sit up properly because of weakness in the muscles of the back. The weakness was not localized in any group of muscles, but was generalized in all four limbs and the trunk. Associated movements were quite frequent and were choreiform in type; irregular, jerky, arrhythmic, involuntary movements accompanied all attempts to walk, speak, or write, or to do any other purposive movement. Muscle tone was markedly affected, the muscles in all four limbs and the trunk being flabby and lacking in the usual firm consistency to be expected in a child of this age. There was marked atrophy in both the thenar and hypotenar eminences of both hands, but in neither one of these groups of muscles was there the reaction of degeneration, nor was this present anywhere else. Sensory changes were absent, except a certain definite disturbance in the ability to recognize the position of her toes on both sides, particularly the big toes. The position of the larger joints, such as the ankle, knee, elbow, hip, etc., were readily recognized. There were no changes in touch, tactile discrimination, pressure, heat or cold or vibration sense, except that the last was markedly diminished in both big toes but present along the shin and both knees and wrists, etc. Cranial nerves all appeared to be functioning properly, except for the possible paresis of the left external rectus. This was not at all certain, however, because there did not seem to be an actual palsy of the external rectus, but merely a weakness, especially in convergence, due to profound refractive changes.

As to mental status, the child was reticent, sensitive, shy, and keenly alive to her deficiencies. She was particularly sensitive about the scoliosis. She was bright, however, keen, and intelligent, not mentally defective, and took a keen interest in everything that was done for her. She had a good grasp on school knowledge and was not in any way retarded.

On the sensory side there was merely a slight disturbance of vibration sense in the big toes and of position sense in all the toes, particularly the big toes, which led us to believe, of course, that the posterior columns were involved and must be called to account for this disturbance of sensation. The ataxia was of the tabetic type and could undoubtedly

be ascribed to the lack of muscle sense, due to the destruction or injury caused by the disease process in the direct cerebellar tracts. The atrophy in the thenar and hypotenar eminences and the general loss of tone and weakness was due to the involvement of the anterior horns. The Babinski, although only occasionally elicited, must be accounted for on the grounds of some involvement of the pyramidal tracts. The nystagmus was probably not vestibular in origin because of its extreme lack of regularity and rhythm and because of its inconstancy. This symptom must be interpreted as an expression of the general weakness existing in the eye muscles supplied by the third, fourth, and sixth cranial nerves, or as an expression of the ataxia such as was present in the limbs. Most probably the first explanation was the true one. The absence of a reaction of degeneration in the atrophied muscles might be accounted for by the fact that the anterior horn cells were not destroyed entirely, and that, therefore, their idiodynamic control of the musculature had not been entirely lost. The scoliosis was undoubtedly an expression of the loss of tone and muscle weakness in the muscles of the spine, which ordinarily make for the integrity of the spinal column in its maintenance of the direct posture.

CASE II.—T. B., a boy, was of a different type mentally from the preceding child. He was one of three children, the other two being normal. His parents, especially his father, were markedly alcoholic. The boy was definitely retarded mentally, as shown by various standardization tests, and besides was extremely obstinate and selfwilled. He was twelve years of age and his symptoms were first noticed about three years ago, when his mother began to scold him for his unsteadiness and for the irregular, involuntary movements of a choreiform type which he began to exhibit at that time. He also began to play truant from school and gave his mother a great deal of trouble. The boy had never been ill until the onset of his trouble.

Inspection showed a fairly well nourished child who stood unsteadily and presented the same type of deformity in the big toes noted in the preceding case. There was *pes cavus* plus hyperextension of the proximal phalanx with flexion of the distal phalanx of both big toes. This child, also, had an irregular, nystagmoid movement in both eyes. Ataxia, both equilibratory and nonequilibratory, was present in all four limbs. Gait was distinctly ataxic when the child walked with the eyes open or closed. Skilled acts were awkwardly performed, although there was no change in speech. Reflexes showed a distinct Babinski response on both sides almost always obtainable. There were no clonus or patellar reflexes and ankle reflexes were much diminished. All other tendon reflexes were somewhat diminished, the superficials, however, being fairly promptly but equally elicited. The pupillary reflexes were normal. Muscle tone showed some relaxation in the muscles of the arm and forearm, but none in the legs. Associated movements of a choreiform type were very marked in this case, it having first been diagnosed as chorea with feeble-mindedness. Sensory examination showed no defects. Cranial nerves all appeared to be functioning properly. According to the standardization tests, we gave this child a mental age of about eight. In evaluating these tests, however, it must be remembered that the boy was extremely sensitive and confessed to an aversion to going to school because the boys made fun of his awkwardness. During the past three or four years, therefore, the child had not had a consistent, continuous school education. Talking to the boy casually during the examinations, one got the impression that he was normally bright, his responses being prompt and intelligent and his apparent grasp on current events, school knowledge, and the usual boy knowledge of his age was good.

The only noteworthy differences between this case and Case I were the absence of atrophy in this

patient and also the absence of sensory disturbances, which could be elicited by the ordinary tests. The ataxia in this child was more marked than in the other, and it was probably true that the involvement of the spinal cord could be found in the lateral columns, that is, in the direct spinocerebellar, ventrospinocerebellar, and pyramidal tracts.

In the following two cases, we have brother and sister suffering from Friedreich's ataxia without any other familial history in the ascendants.

CASE III.—J. B., a boy, age twelve years, born in the United States, began to complain of headaches, dizziness, and irregular, involuntary movements two months prior to coming to the clinic. The onset was very gradual and the condition has remained stationary. The boy was said always to have had some trouble with his stomach; he had scarlet fever at eight and measles a year before that. The family history showed that on the mother's side her father was a hard drinker and the mother died from cancer. The mother herself thought she was nervous and said that four brothers and one sister died early in childhood. The cause of death in these five relatives was unknown. Another was said to have died at thirty years of age, cause unknown. One brother, fifty-six years of age, was insane and an epileptic, being an inmate of the Gawanda State Hospital for many years. The patient's father and mother were not related; the patient's father was forty-one years of age and in perfect health, and had, however, one brother who was inclined to drink too much occasionally but was otherwise normal. Three sisters were living at forty-five, fifty-three, and fifty-five years of age, respectively. So far as we were able to find out, there was no history of a similar illness in any member of the family other than the patient's own sister; these two children both suffering from the same illness were the only issue.

He began two months ago with eructations of gas and attacks of indigestion. For a few days before the patient was seen (April 30, 1917) he began to have headaches and dizziness and numerous involuntary twitches, especially blinking the eyes and drawing them upward. More careful questioning elicited from the mother the information that in November, 1916, she noticed that the boy was slightly unsteady on his feet in walking and had a tendency to fumble in both hands when he played. This unsteadiness of gait, however, became considerably worse two months before admission to the clinic. The Wassermann reaction was negative. Inspection showed a well nourished boy of twelve years who stood unsteadily on his feet, even with his eyes open, and had inconstant, irregular, nystagmoid movements. The deformity of the big toes, however, was absent in this boy. Coordination showed distinct ataxia, both equilibrium and nonequilibrium. Gait was decidedly ataxic, both with the eyes open and closed, there being a tendency to correct the swaying when the eyes were open by slight movements of the head and trunk. With the eyes closed, however, the swaying and the staggering gait was more marked, the staggering taking place in any direction with the eyes open and more, particularly to the left, with the eyes closed. Skilled acts were all awkwardly and poorly performed because of the ataxia. Speech showed some unsteadiness in holding vowel sounds as in "Ah." All deep reflexes were diminished, the patellar reflex absent, as were also the ankle jerks. The superficial reflexes, however, were active and equal. There was no Babinski and none of its modifications. There was no loss in muscle strength and no atrophy. The number and quality of associated movements in this patient were quite marked and were so distinctly choreiform in type that this case also was tentatively diagnosed at first as chorea and was not positively recognized as a case of ataxia until seen several times. The patient continually jerked his head, trunk, arms, and legs, all of these irregular, involuntary acts being worse when the child's eyes were closed. When the hands were extended in front of him, there was a general waving of the arms and hands in an irregular, involuntary movement. There was adiadochokinesis in both hands. There was no change in the muscle tone. The electrical

reactions were normal. There was distinct scoliosis in the dorsal spine, the curve being to the left. Sensory examination showed no change, except some hypersensitivity to cold in both feet and some change in the circles of Weber in the big toes, the circles being from eight to ten millimetres. The vibratory sense was also absent in the terminal joint of the left big toe and in both joints of the second and the terminal joint of the third toe on the left side. The sense of position was lost in both big toes. Cranial nerves were functioning properly. The mental status was normal.

The posterior columns and the direct spinocerebellar and the ventrospinocerebellar tracts were apparently involved. There was also no evidence apparently that the pyramidal tracts were involved. The unsteadiness in speech, particularly in the pronunciation of vowels, was an expression of the ataxia and possibly of some weakness in the laryngeal muscles or in the muscles of the soft palate. Particular attention should be called to the mild, although very definite, changes of sensation in this case, the modalities of sensation affected being position, temperature, vibration, and tactile discrimination. On account of the great amount of ataxia present, there seemed to be no doubt that the greatest amount of damage done to this boy's cord was in the spinocerebellar tracts; the ataxia was distinctly spinal in type.

CASE IV.—E. B., age fourteen years, sister of J. B., born in the United States, also came to the clinic April 30, 1917. The duration in this case was two years and the complaint was the same—twitchings, unsteady movements, and what was absent in the brother's case, pain in both legs. The onset was also gradual and there was a distinct history of trauma at nine years of age, following which the patient was said to have been unconscious for at least ten minutes. From this trauma the child recovered very slowly, had headaches and vomiting occasionally, and did not really become well for two months. The child had her adenoids and tonsils removed at the Vanderbilt Clinic some five or six years ago; she had diphtheria at seven, whooping cough at nine, and measles at eight. Prior to removing her tonsils she had frequent attacks of tonsillitis. The family history in this case was, of course, the same as the brother's, but this patient's present symptoms began two years ago when she was the same age that her brother now is. She also had occasional headaches in the beginning, but is free from them now. The mother stated that this patient had always been very unsteady on her feet; she also noticed that the child, practically from infancy, had a habit of momentarily shaking her head, staggering when walking, and fumbling and twitching with her hands. The scoliosis in this case was to the right. The deformity in the feet showed high arches and slight hyperextension of the toes, especially at the proximal joint.

It will be particularly noticed that this was the first of the cases so far dealt with in which the typical Friedreich's foot occurs, that is, both feet were highly arched and there was considerable hyperextension of the toes, especially at the proximal joint and flexion at the distal joint. It will be noted, too, that this patient had the disease for five years or more and that her brother, who had only been ill less than a year, showed only slight changes in the toes and in the arching of the foot. The contracture of the foot producing the typical pes cavus did not occur until long after the onset of the illness when the muscles began to show contracture, probably due to replacement of the atrophied muscle by connective tissue. In the beginning, instead of a highly arched, contracted condition of the foot, there is good evidence to believe from an analysis of our first case, that there is apt

to be great relaxation instead of a stiffening of the arch and a typical *pes planus* may exist.

The examination of this patient showed a tall, thin, rather poorly nourished girl, ungainly and awkward in appearance and action, unsteady on her feet, with a number of irregular twitchings in the head, trunk, and limbs, and involuntary movements of a choreiform type. Equilibratory and nonequilibratory ataxia was present in both limbs. The gait was distinctly ataxic and all skilled movements were poorly performed because of the presence of this symptom. Speech was not affected. Peculiarly enough, all tendon reflexes were absent in this patient, excepting the jaw jerks, which were very active. There was, however, no Babinski and none of its modifications, although at times several observers, including Doctor Tilney, were positive that a Babinski response was occasionally obtainable in the right foot. The superficial reflexes were present, active, and equal. Pupillary reflexes were normal. There was a great deal of generalized, evenly distributed loss of muscle strength in all four limbs, head, and trunk. There was a distinct scoliosis in the dorsal region to the right. The associated movements were many and choreiform in type, and involved the head, trunk, and limbs. There was no change in muscle tone. The electrical reactions were normal. All qualities of sensation were normal, excepting vibratory sense in the big toe joints and posture sense in the left big toe. All the cranial nerves were functioning properly and showed no change. The fundi were normal in this case, as they had been in each of the three preceding cases. The Wassermann was also negative. Mental status was normal.

In this case also the disease process seemed to be limited to the cerebellar tracts and a slight involvement of the posterior columns was indicated with a possible involvement of the pyramidal tract on the right side.

CASE V.—F. D., age forty-four years, married, born in the United States, a housewife by occupation, was admitted to Kings County Hospital, August 13, 1906. The diagnosis at that time was polyn neuritis; the revised diagnosis was *tabes dorsalis*. The patient had since been shown a number of times as a case of *tabes* at various clinics held at the hospital. The history as obtained at the hospital soon after her admission eleven years ago was as follows: The father died at the age of sixty years from an accident. Her mother died from pulmonary tuberculosis when the patient was ten years of age, the mother's age being forty-seven. Three brothers died of tuberculosis and two of unknown causes. One sister died of tuberculosis; two other brothers and two sisters were alive and well. A note was found in the old history that one of the brothers the cause of whose death is given above as unknown, was said to have died from a similar nervous condition to hers at the age of thirty-five years. When the patient gave this history, she stated that she remembered very little about her brother's trouble. [In passing, I might mention that this note in her history made distinct reference to her ataxic speech, it being described as a peculiar "weak, sliding speech."] All that we were able to learn about this brother was that when he was a boy he fell from a horse. Thereafter he could not walk without being supported and was very weak in his legs. The patient's brother could walk with crutches, but the trouble in the legs finally grew slowly and steadily worse and eighteen years after the injury this brother died. It was distinctly stated that this relative could use his arms and hands well and was able to feed and dress himself and could write until the time of his death. It was also said that the brother suffered from no loss of sphincter control and did not show mental deterioration. The brother was not confined to his bed until five days before his death. The patient had measles when a child, scarlet fever when she was twenty-three years of age, and diphtheria a year later. The menstrual history began at twelve and continued normal. The condition at the time of the patient's admission to the hospital dated back one year, the illness having begun seven years before that. When admitted to the hospital she complained of weakness in the legs and back and inability to walk or use her limbs. The record of the examination at that time described a pronounced scoliosis in the middorsal region.

There were no tender spots along the spine. The patient was unable to sit up alone and when helped up the pelvis tipped to the right and the legs and arms were said to be spastic (?). The patellar reflexes were gone, and the legs, when lying down, were usually held flexed. At that time it was said there were signs of tuberculosis in both lungs.

The next note in the history was taken about seven months after admission. Ataxia was described in both hands, but it was distinctly stated that there was none in the legs; this, however, was probably a mistake. The existence of an intention tremor was described in both arms. There was no mention of pain in either the arms and legs and the knee jerks continued absent. Both legs were edematous. Sensation on the neck and face was normal, but light touch with hair was not felt over the hands and forearms and sensation over the thighs and legs, tested also by hair, was very much diminished. Touch was said to be recognized promptly over all parts. There was no Babinski and apparently no ataxia in the legs at this time except when the eyes were closed (?). The dorsal curve of the scoliosis was to the right. Temperature sense was normal all over, with a possible diminution in the right leg. About this time also some loss of power was noticed in the arms and some atrophy in both little fingers. The patient was married when she was eighteen years of age and had had five pregnancies, two miscarriages, and one normal child after that. Personal habits were always good, the patient never using alcohol or any other toxic substance habitually.

Ten years before the onset of the trouble she fractured her right leg in an accident. Following this injury she never regained her strength, complaining of pain across the small of her back and dizziness. Following the attack of diphtheria which occurred soon after her accident she found that she had difficulty in walking and could not control the movements of her feet and hands, at times staggering as if she were drunk. Two years before admission she had her last child and became steadily worse until shortly after childbirth she was unable to walk at all. However, more than a year before admission she had great trouble in using her upper extremities, not being able to hold even a glass of water with two hands. She complained at various times that her feet felt as if they were asleep, and she felt at frequent intervals tingling and pricking sensations in her lower extremities. The urination was said to have been frequent and bowels constipated. Vision and hearing were both normal. She complained at times that she had a buzzing noise in both ears. The examination as made seven months after her admission to the hospital was as follows: The patient had a rather silly expression. Most of her front teeth were gone. The pupils reacted promptly and equally. The scoliosis involved both the dorsal and lumbar regions and the apex of the deformity was at the eighth dorsal level, the curvature being to the right. The patient could sit up without support. Extension from the shoulders was said to reduce the deformity in the spine considerably. The reflexes at the elbow and wrist were gone. The patient was said to use her hands by throwing the forearms from the elbow. She also was awkward, and it was found that she had great difficulty in picking up things with her fingers, the tendency being to extreme pronation. The thenar eminences were soft and flat. Sensation in the upper extremities was said to be normal. The reflexes in the lower extremities were absent and sensation at this examination was put down as being O. K. (?) Distinct ataxia was found in the lower extremities. It was impossible for the patient to bear the weight of her body on her feet even a moment without crumbling up. The feet and legs were cold and blue, but the power in all muscles of the lower extremities was regarded as being normal.

The foregoing was obtained by careful perusal of the records at Kings County Hospital and differed very little in any of its essentials from the history now obtainable. It might be well to state that very little dependence could be placed on the patient's memory at this time because she cooperated very poorly. She had distinctly lost interest in everything, and being apparently resigned to her fate she could not be roused from complete indifference. However, with these facts in mind, it might be well to give her account of the onset of the illness, which she said began six months after she broke her tibia for the second time

in 1898. She was walking when suddenly she staggered and fell and broke her leg in the same place again. When she finally got well from her injury she said that she gradually lost the use of both of her legs and felt as if she were treading on cotton or something soft and that she staggered in walking and fumbled in all her movements. The patient was not aware that she had any difficulty with her speech and stated that she always talked as she did now. The examination at the present time was as follows: Smell was normal; the fundi showed a slight pallor but it could not be said with certainty that atrophy was present; vision was apparently normal; all pupillary reactions, both to light and accommodation, were normal. The same peculiar nystagmoid movements were present as in the first three cases. There were no irregularities in the size or shape of the pupils; both the corneal and consensual reactions were present. There was some weakness in convergence but no apparent palsy of the third, fourth, or sixth nerve. All the other cranial nerves appeared to be functioning properly with the exception possibly of the seventh and twelfth. This patient also had that peculiar blank expression noted in the two cases which follow and had considerable difficulty in holding her tongue in any fixed position for even a short time. The speech was halting and distinctly ataxic and changed in the same sentence in both pitch and tone. The patient was unable to stand or sit. There was great weakness in the muscles of all her extremities and also in the muscles of the neck and trunk. There was no tremor. The ataxia was very marked and cerebellar in type in both hands and legs; more marked, however, in the former. All the superficial and deep reflexes were gone. There was a distinct double Babinski but no clonus. There was atrophy in the muscles of the forearms and in the thenar and hypothenar eminences and also some in the legs. The typical deformity described in the last case was present in the right foot but not at all marked in the left. There was a marked scoliosis to the right in the entire length of the spine, most apparent in the dorsal region. Distinct disturbances of all qualities of sensation were present. There was a hyperesthesia to pain and temperature all over the body, excepting the face, more marked in the limbs, and still more marked toward the periphery of the limbs. There was a hyperesthesia to touch and cottonwool all over the body, excepting the face, gradually increasing toward the periphery in the limbs. There was a distinct loss of position sense in the hands and fingers which was not found in the legs and toes, and passpointing showed marked irregularities in both hands. This could not be tested in the legs because of the great weakness. Tactile discrimination by the two point test was greatly diminished all over the body, except the face, and there was a marked loss of the sense of pressure and also of vibration.

In this patient, the symptoms would lead one to believe that the damage done to the spinocerebellar tracts was quite extensive. In line with my arguments, concerning the development of the typical Friedreich's foot, it will be noted that in this patient, ill with the disease for almost twenty years, the typical Friedreich's foot was seen on only one side, the reason possibly being that this woman had been bedridden and in a hospital for a number of years, and had had a great deal of treatment in the way of massage and electricity, which might have had some influence in the prevention of the development of the contracture. It will be noticed that the atrophies in this case distinctly showed a very gradual development over a long period of years, and that the same process of reasoning could be applied to the development of the atrophies as in the first case and in the case reported just before this one. There seemed little room for doubt that in both these individuals, the illness existed from early childhood and was not recognized for a long time.

Profound damage had been done to the posterior columns, the destruction being as complete as

would occur in any case of tabes lasting a much shorter period of time. There was also distinct involvement of the pyramidal tracts, as evidenced by the double Babinski and Chaddock responses. Of the cranial nerves, the second, both seventh, and the twelfth were involved. There seemed to be an undoubted pathological pallor of both discs, and the peculiar, silly expression on the face, which was really rather a lack of expression, was undoubtedly due to a double paresis of the muscles of expression. There was also a great weakness in the tongue. It is well to state, in connection with this discussion of the cranial nerves, that there was no reaction of degeneration in the distribution of the seventh on either side.

Here, also, there must be some involvement of the anterior horns, because the atrophy was profound and undoubted. There was a partial reaction of degeneration in both muscle groups comprising the thenar and hypothenar eminences, that is, faradic excitability was greatly diminished but not entirely lost, and the anode response was equal to but did not exceed the cathode. Another point in this case which was not brought out in the examination is that there was a distinct atrophic change of the rarefying osteitis type in both the long bones of the lower extremities and in a good many small bones of both feet, as shown by x ray examination. The Wassermann reaction, both in blood and in spinal fluid, in this case had been repeatedly tested and found negative. There was no increase in pressure in the spinal fluid. No cells were found. The globulin was negative. Fehlings was not reduced and the Lange test was negative.

(To be concluded.)

ACTIVE IMMUNIZATION AGAINST DIPHTHERIA.

Results in a Large Child Caring Institution.

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Pathologist, Home for Hebrew Infants.

During the past few years our knowledge of immunity in diphtheria has been greatly advanced by the introduction of the Schick test. By its use we are now able to control any new form of prophylactic treatment, since the test has been shown to be a very accurate measure of the body's immunity. Such a new form of preventive treatment is the toxin antitoxin injection first advocated by Theobald Smith and William H. Park, and later put upon a practical basis by von Behring. During the past year we were able to use this active immunization and to control it by means of the Schick test in the Home for Hebrew Infants, an institution specially adapted for this work. Its population is almost constant so that cases can be observed and retested for a period of about five years and furthermore, the ages of the children coincide with the most frequent age incidence of diphtheria.

During the previous year diphtheria was endemic in this institution and during this time there were six deaths due to the disease. It was a problem therefore to attempt to reduce if possible the morbidity and consequent mortality and we welcomed

the opportunity to segregate by means of the Schick test those immune from those susceptible and to attempt to increase the number of the former by means of toxin antitoxin injections. The diphtheria toxin used in the test was obtained in bulk from the Research Laboratory of the New York Department of Health. Dilutions for the test were made from the pure diphtheria toxin as follows: One hundred times the minimum lethal dose for the guineapig was diluted up to ten c. c. of normal saline. This is known as the primary dilution and will not deteriorate if kept cold in the icebox for two weeks. The final dilution, good for twenty-four hours only, was made by taking one c. c. of the primary dilution and adding ninety-nine c. c. of normal saline. As suggested by Dr. W. H. Park and Dr. A. Zingher, 0.2 c. c. of the final dilution, representing 1/50 minimum lethal dose for the guineapig, is the amount injected intracutaneously. The injection is made best with a one c. c. record syringe, with a fine platinum iridium needle on the anterior surface of the forearm in its upper third. Schick injects 1/50 minimum lethal dose for the guineapig in 0.1 c. c. of normal saline. The injection of 0.2 c. c. of the final dilution is preferable because the reaction is greater in extent and the chance of error in the amount injected is less.

A negative Schick test denotes that there is sufficient antitoxin in the tissues to neutralize the diphtheria toxin injected and therefore enough to protect the individual. A positive Schick test denotes that there is either very little or no antitoxin in the tissues and therefore the individual is probably susceptible. The positive reaction appears in twelve to twenty-four hours and is characterized by a circumscribed area of redness and slight infiltration at the site of the injection, measuring from one to two centimetres in diameter. This persists for seven to ten days and then fades with superficial scaling and a dark brown pigmentation. I have seen the pigmentation persist for as long as three to four months. The positive reaction is dependent upon the local destructive action of diphtheria toxin on the tissue cells in the absence of antitoxin. The moderately and faintly positive reactions are characterized by lesser degrees of redness and infiltration than the strongly positive. The pseudoreaction, a pure sensitization phenomenon, occurring in older children and adults, was rarely seen in the children tested.

For convenience the strongly positive reaction can be designated as +, the moderately positive as ± and the faintly positive as ±. The following table summarizes the reactions obtained in various age groups from one month to six years. For comparison I have appended tables showing Schick's and Zingher's results:

RESULTS AT HOME FOR HEBREW INFANTS.

Age	Total	—Schick	+Schick	Percentage +Schick
1 to 6 months.....	42	34	8	19.0
6 months to 1 year....	50	27	23	46.0
1 to 2 years.....	106	64	42	39.6
2 to 4 years.....	204	132	72	35.3
4 to 6 years.....	127	107	20	15.7
Total	529	364	165	31.2

ZINGHER'S RESULTS.

Age	Total	—Schick	+Schick	Percentage +Schick
1 to 6 months.....	101	82	19	18.0
6 months to 1 year....	84	40	44	52.3
1 to 2 years.....	52	28	24	46.1
2 to 4 years.....	127	82	45	35.8
4 to 6 years.....	108	88	20	18.5
6 to 8 years.....	25	22	3	12.0
Total	497	342	155	31.2

SCHICK'S RESULTS.

Age	Total	—Schick	+Schick	Percentage +Schick
New born	291	275	16	7.0
First year	42	24	18	43.0
2 to 5 years.....	150	55	95	63.0
5 to 15 years.....	264	133	131	50.0
Total	747	487	260	34.9

It will be observed from the results obtained at the Home for Hebrew Infants that approximately one third of the children tested were found to be susceptible to diphtheria. Moreover, these susceptible children were most frequently encountered between the ages of six months and four years, and were fewest in number in infants younger than six months. The infrequency of positive reactions during the first half year of life is due to an immunity inherited from the mother. That this immunity may be gradually lost was well illustrated by retesting the infants from time to time, for it was found that a number of those who gave negative reactions during their first six months of life became positive later on; in other words their inherited immunity was gradually lost. Of a total of ninety-two negatives up to the age of one year, twelve became positive three to six months later. Eight of these were in their first half year of life and four in the second half year.

The outcome of the test in members of the same family is also of interest. Of twenty-one families tested, two or more members in sixteen gave the same Schick test. Variations occurred in five families as follows: In three instances the younger member gave the positive Schick test and the older the negative; in two instances the younger member, in each case three months old, gave the negative Schick test, while the older gave the positive. This last variation is probably due to an inherited immunity, which would be lost later on. These variations in the negative Schick tests during the first year of life emphasize the importance of frequently retesting infants in institutions. The retests should be done at least every three months. It is worthy of note that of the 364 negative Schick cases, in not a single one, though the children were constantly exposed to infection, did clinical diphtheria develop.

Having thus ascertained that one third of the inmates of our institution were susceptible to diphtheria, we proceeded to attempt to immunize these children as follows: Eighty faintly, moderately, and strongly positive Schick cases were injected with diphtheria toxin antitoxin mixtures. The moderately and strongly positive cases received three injections and the faintly positive two injections only. The injections were given subcutaneously in the outer arm at the insertion of the deltoid mus-

cle at intervals of one week. Children under one year received 0.5 c. c. and over one year of age, one c. c. of the diphtheria toxin antitoxin mixture at each injection. There was occasionally a little redness and swelling at the site of the injection and a rise in temperature in twenty-four hours up to 101° or 102° F., coming down to normal in another twenty-four hours. Vomiting occurred in one case only. In order to test the permanence of the immunity thus conferred, these children, eighty in number, who had received toxin antitoxin injections were subjected to the Schick test three to four months after their last injection and again nine to ten months later. The following table summarizes the results obtained:

SCHICK TEST RESULTS AFTER IMMUNIZATION WITH DIPHTHERIA TOXIN ANTITOXIN MIXTURES.

Cases injected	3 to 4 months later	9 to 10 months later
80	74—	74—
	2±	2—
	2+	2±
	2+	1+
		1—

Note: + = strongly positive; ± = moderately positive; — = faintly positive.

From the table it will be seen that very striking results were obtained. Whereas before our toxin antitoxin injections about eighty children were susceptible to diphtheria, ten months later these had been diminished to three susceptibles. In three to four months after the last injection, 92.5 per cent. of the positive cases became negative or immune. In nine to ten months after the last injection, 96.2 per cent. became negative. These marked results show the great practical importance in the active immunization of susceptibles to diphtheria in individuals and institutions. In this way an institution can possibly be rendered immune.

It is interesting to note that during the past year and a half, there was not a single case of diphtheria at the Home for Hebrew Infants. During this same period there were only about three positive cultures in all throat and nose conditions. That this is mere coincidence is possible, but one cannot help conclude that the toxin antitoxin injections were instrumental in freeing the institution of diphtheria, despite the fact that there were a small number of susceptibles not immunized. It is also possible that the toxin antitoxin injections rendered the nose and throat an unfavorable seat for the growth of the Klebs-Loeffler bacilli. The blood being antitoxic, the local toxin would not irritate the epithelial cells and thus render the oral and nasal mucous membrane unfavorable for the growth of diphtheria bacilli.

I wish to thank Dr. A. F. Hess, Dr. S. V. Haas, and Dr. M. H. Bass for the kind aid extended to me. I am also grateful to Dr. W. H. Park and Dr. A. Zingher, of the Research Laboratory of the New York Department of Health, under whose supervision the early part of this work was done.

CONCLUSIONS.

1. A year and a half's experience with 529 children shows a negative Schick reaction is evidence that there is sufficient antitoxin in the tissues to protect the individual against diphtheria infection.

2. A positive Schick test denoted the absence of

antitoxin in the tissues. The faintly positive reactions did not at all times protect the individual from infection.

3. Members of twenty-one families usually gave the same reaction to the Schick test; where variations did occur, the younger member gave the positive and the older gave the negative reaction.

4. Variations in negative Schick cases during the first year of life, due to the loss of an inherited immunity, were found to be sufficiently numerous to justify retesting during this period at frequent intervals. This procedure is especially desirable in infant asylums.

5. It is possible to render a child caring institution diphtheria free. This has been accomplished during the past year and a half by injecting all susceptibles with toxin antitoxin mixtures at the Home for Hebrew Infants.

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550 WEST 157TH STREET.

Relative Efficiency of Certain Antiseptics.—H. D. Dakin and E. K. Dunham (*British Medical Journal*, November 17, 1917) discuss the subject of the testing of the germicidal powers of antiseptics and point out that many factors must be taken into consideration to avoid misleading results. In order to approach as closely as possible the conditions under which antiseptics must act in wounds they studied the rate of bactericidal action of various concentrations of a number of antiseptics when added to uniform, heavily sown cultures of *Staphylococcus aureus* in blood serum, Witte's peptone in normal saline, fresh defibrinated blood, and horse serum plus muscle extract. The results of a large number of experiments showed the phenomenally rapid action of the members of the chlorine group, such as sodium hypochlorite, eusol, chloramin-T, and dichloramin-T. The bactericidal action of these was at its maximum within five minutes and, except in the case of the more stable chloramines, had become practically nil in from one to three hours. Various metallic salts, phenol, and peroxide of hydrogen were much slower in action and some, such as argyrol, were very slow. The dyes, including the flavines and malachite and brilliant green, proved very disappointing in bactericidal action in the serum muscle medium and were extremely slow. They were better, but still feeble, in defibrinated blood. The experiments showed rapid and complete disinfection of the serum muscle cultures by all of the chlorine group used in concentrations similar to those employed in wound treatment, which contrasted with the failure of the several dyes to sterilize completely the cultures in six to twenty-four hours.

Our Readers' Monthly Prize Discussions

Twenty-five Dollars Is Awarded for the Most Satisfactory Paper

All persons, whether subscribers or not, are invited to compete for the prize of \$25 offered for the reply deemed best by the editors to the following questions:

CXC.—How do you treat burns? (Closed.)

CXCI.—How do you treat lobar pneumonia? (Answers due not later than February 15th.)

CXCII.—How do you treat whooping cough? (Answers due not later than March 15th.)

The award will be based solely on the value of the information contained in the answer. No importance will be attached to literary style. Answers should preferably contain not more than six hundred words, and should be written on one side of the paper only. All papers submitted become the property of the JOURNAL, and should bear the full name and address of the author for publication. The prize will not be awarded to the same person more than once within a year.

The prize of \$25 for the best answer to Question CLXXXIX has been awarded to Dr. John E. Koons, of Chicago, whose paper appears below.

PRIZE QUESTION NO. CLXXXIX. TREATMENT OF FAINTING.

By JOHN E. KOONS, M. D.,
Chicago.

Syncope, from the Greek meaning "cutting off," fainting, or swooning of the vernacular, is acute cerebral anemia. It is one of the common presenting symptoms in practice. The mechanism of this acute cerebral anemia has never been adequately explained, but a study of the condition in the light of the work of Eppinger and Hess and others on the vegetative nervous system and of Cannon in *Bodily Changes in Pain, Hunger, Fear, and Rage* lead one to believe that its explanation is bound up in the problems of loss of equilibrium in the antagonizing sympathetic and autonomic systems, through the stimulating effect of hormones emanating from organs of internal secretion. In making this statement, however, it should be borne in mind that acute cerebral anemia may arise from a diversity of conditions, many of them organic, in which there is a loss of vascular equilibrium. In fact, it is probable that the conditions which Eppinger and Hess have popularized under the name of vagotonia may account for only what might be called, for want of a better word, functional syncope.

In examining the matter of acute cerebral anemia, one may consider it as due to a loss of equilibrium within the vascular system due to organic disturbance of the heart, changes in the viscosity, lowered blood pressure, mechanical interference with the circulation, and disturbances of the nervous control of the various factors concerned in the maintenance of circulation. These constitute probably only a part of the explanation.

For purposes of ready perusal, a topical analysis of these causes of loss of vascular equilibrium is presented: Organic changes in the heart: coronary sclerosis angina pectoris; interference of transmission through the bundle of His—Adams-Stokes syndrome; here also may be considered the other disturbances of transmission of nervous impulses of the heart, including the various arrhythmias, also paroxysmal tachycardia; dilatation of the heart—aortic insufficiency, acute endocarditis, cardiorenal disease, and the hypertension of arteriosclerosis. Increase in viscosity of blood: dehydration—cholera, dysentery, violent purgation, quick withdrawal

of fluid accumulations as in rapidly reaccumulating ascites from any cause or hydrothorax; chronic passive congestion—decompensation with massive edema of dependent tissues, edema of nephritis. Lowered blood pressure: hemorrhage—gastric or duodenal ulcer, varicosities of esophagus or stomach in cirrhosis of the liver, extrauterine pregnancy, typhoid fever, cancer of stomach, second and third degree labor; transfusions—doner; chronic constitutional diseases—tuberculosis, anemias. Mechanical interference with circulation: pressure on large vessels; reversal of circulation; ligation of large bloodvessels—aneurysm of aortic arch, traumatic asphyxia, arteriovenous aneurysm, ligation of carotid artery in operations. Disturbances of nervous control of the circulation: loss of equilibrium in the vegetative nervous system—functional syncope, as a possible manifestation of vagotonia. Disturbances of secretion of glands of internal secretion, with resultant loss of equilibrium in vegetative nervous system: Addison's disease; hypernephroma.

The manifestations of syncope may be given by an illustration. The syncope which a first year medical student experiences during his first visit to an operating amphitheatre is a case in point. All of a sudden, the room appears to get dark, as when a cloud obscures the sun. Objects take on a fuzzy outline, as if out of focus. Yellow jigger spots dance before the eyes. Beads of cold sweat form on the forehead. The hands first feel sweaty, then clammy. There is an "all gone" sensation in the epigastrium. There is a sensation in the ears which, if more pronounced, might be called tinnitus. The tongue feels dry. A drink of cold water is the requisite of the moment. One gulps. The legs seem to be giving away, or one actually slowly settles in a heap on the floor. The hands tremble. The whole affair passes gradually, but rather quickly away, with or without actual unconsciousness. This is an experience which almost everyone has been through at least once. In fact, since they usually do not recur, one might almost say that an immunity was acquired; possibly, the vegetative nervous system is educated, as one might say, so that at future times protective forces within the vegetative system maintain equilibrium. The manifestations noted are strikingly like those described as the surface manifestations of excitement by Cannon in his work on the bodily changes in pain, hunger, rage and fear, i. e., pallor, cold sweat, stopping of

salivation, dilated pupils, hurried respiration, trembling and twitching of muscles, which he ascribes to contraction of surface bloodvessels, together with those of the brain, and dilatation of splanchnic vessels. It has further been shown that the splanchnic stimulation increases secretion from the suprarenal bodies and causes a discharge of adrenalin into the circulation; that adrenalin secretion is increased in emotion; that adrenalin stimulates the sympathetic innervation, this sympathetic or cervicothoracico-lumbar system being antagonistic to the autonomic or craniobulbar system in which the vagus fibres play such an important rôle. The overstimulation of the sympathetic system is known as sympathicotonia, the feature of which are, in some respects, similar to those seen in the initial period of syncope, such as rapid heart action, rapid respiration, and increased velocity of the circulation in general. Adrenalin constricts bloodvessels, inhibits the action of the alimentary canal and raises the blood pressure. Adrenalin also acts to liberate sugar from the liver to the circulation. Sugar is the optimum source of muscular energy, so necessary in the vital emergencies of life. Moreover, adrenalin causes the blood to be driven from the abdominal viscera, to which it has been driven by the initial contraction of surface vessels, into the heart, lungs, central nervous system and limbs, i. e., the machinery which must act in great emergencies. This constriction of the bloodvessels in the peripheral circulation is a protective mechanism to provide an adequate supply for the great emergency machinery.

The unconsciousness of functional syncope may represent an overstimulation of the sympathetic nervous system with resultant constriction of cerebral vessels, causing acute cerebral anemia. On the other hand, the acute cerebral anemia may be due to loss of vascular equilibrium, when the blood from the peripheral circulation is concentrated in the splanchnic area. As the blood is quickly forced out of the splanchnic area to the heart, lungs, and central nervous system, this may further explain why recovery from syncope is usually rapid and the condition itself transient. If we may conceive that the phenomena of syncope do not arise, or that the phenomena incident to an overstimulation of the sympathetic system do not arise, when all the available adrenalin is mobilized for furnishing an adequate supply of energy in the form of sugar to the muscles, it may help us to correlate these data with common experience, viz., that syncope is unusual during strenuous muscular exertion, and that syncope is more apt to occur after stress or excitement, as a marathon race or auto smashup, than during or before it.

The dash of cold water to the face, exposure of an extensive area of skin and vigorous rubbing of the hands are effective in syncope because they improve the peripheral circulation, counteract the surface phenomena noted, and thus tend to reestablish vascular equilibrium. Usually functional syncope is so transient that no other measures are necessary. If the action were more prolonged, one would be tempted to suggest the use of drugs whose action is antagonistic to that of adrenalin. In con-

clusion, it may be said that the treatment of any form of syncope depends upon the factor or factors causing the loss of vascular equilibrium, and until those causative factors have been established, any treatment is of the gunshot variety. The treatment of syncope incident to organic cardiac changes, for instance, would demand a different rationale from that for chlorosis or other anemia.

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Dr. James Frederick Rogers, of New Haven, writes:

The treatment of fainting resolves itself into the treatment of the attack and the correction of causative conditions. The fainting fit tends to cure itself by prostrating its victim and thus leading to the reestablishment of normal circulation. If one observes signs of fainting he should advise the victim to lie down and should help him into the horizontal position. If the patient has already lost consciousness and leans against a chair or other object, he should be placed flat on the floor. If deemed advisable to allow the patient to recover where he has fallen a first aid glass capsule of aromatic spirits of ammonia, carried for such an emergency in the vest pocket, should be broken and applied to the fainter's nostrils. If cold water is at hand it may be sprinkled on the face and neck, or a handkerchief or towel wrung out of water can be flicked against the exposed skin. The head must be kept low and if there is a hassock or other suitable object for the purpose, the feet and legs may be elevated, thus draining the venous blood from the lower extremities. Where the swoon is profound and recovery correspondingly slow, a towel or other suitable broad bandage should be applied firmly about the abdomen in order to return the blood accumulated in the veins of this region to the heart and arteries. If deemed helpful the clothing about the neck and chest should be loosened.

Fainting fits occur most frequently in crowded rooms and the high temperature of the air is a prominent causative factor. Under such circumstances if a window is at hand it should be opened and the patient placed near enough to receive fresh air from it, but if possible, it is usually better to remove him from the room at once. He should be carried in the horizontal position with head low to an adjoining room or out of doors, as advisable. The removal of the patient prevents the crowding about of the curious and diminishes the likelihood of sympathetic fainting on the part of others in the room or even, in a crowd, out of doors. Two or three capable persons should be asked to assist in caring for the fainter until he is fully recovered or taken home. After removal to a suitable place the procedures mentioned above may be carried out. When the fainter regains consciousness he should be kept in the horizontal position until the circulation is quite reestablished. A teaspoonful or two of whisky or brandy, given undiluted, may hasten recovery, though not essential. The use of aromatic spirits of ammonia may be helpful but often upsets an already tipsy stomach.

Where fainting is of rare occurrence, and from sufficient cause, further treatment is unnecessary, but where such fits are frequent upon slight provo-

cation all possible aid should be given to find and remove the cause. The general health may be at fault; digestive disorders lead especially to an easy depression of the circulatory machinery. Introspection is too often at the bottom of the depressed vitality as well as a precipitating factor of the fit. An out of door athletic life in good company with regular meals and plenty of sleep should go a long way toward the cure of the young subject, while direction of mind and body toward some absorbing work—social service helps to clear a selfish and introspective state—should improve the emotional atmosphere of the adult. We know a man who fainted under the excitement of being measured for his first tailor made suit of clothes but who, strange to say, became an expert dentist, and the hothouse recruit who swoons during vaccination for typhoid may, in the absorbing business of battle, be severely wounded without being conscious of the injury. Those who fear lest they faint in future, should be told to get into the horizontal position when they feel that consciousness may be fading. The knowledge that they can thus save themselves serves in a measure to prevent the attack. Aside from the presence of a highly sensitive nervous system, a disordered digestion and general unsanitary use of mind and body it should be remembered that in a few cases the tendency to syncope is an accompaniment of anemia, heart disease, ascites, Menière's disease and perhaps a few other specific causes.

Dr. Lawrence E. Cotter, of Poughkeepsie, N. Y., says:

Fainting or syncope is a sudden temporary loss of consciousness due to cerebral anemia in contradistinction to coma, which is a prolonged unconscious state. The relationship and proper diagnosis of the two conditions is important in the treatment of any form of fainting, in order that one may know whether he is dealing with ordinary syncope or an impending coma with fainting, as a premonitory symptom. Ordinary fainting is recognized by extreme pallor, weak pulse, and feeble heart sounds. It may occur in most healthy individuals. Generally predisposing causes, such as overexertion, fright, lack of food consumption, momentary circulatory disturbances and general debility are present. Symptomatic fainting is present in many cardiac diseases, following traumatism of any degree, in many gastric disturbances, in hysteria; it precedes the many comatose conditions, and is an important early sign of apoplexy.

The primary treatment of all fainting spells, whether ordinary syncope or symptomatic in character, should be by proper first aid measures. First lay the patient flat on his back, or even raise his feet higher than his head; loosen all tight clothing not only around the neck but also that covering the chest and abdomen. If fainting occurs, when a person is in a sitting position, do not change from this position, but have the patient lean forward with his head between his knees and as low as possible. Plenty of fresh air should be accessible. Next the skin should be stimulated. Rub the face or better still the epigastrium with vinegar or some alcoholic solution. Tickling the mucous membrane of the

nasal cavity with a feather gently often acts indirectly as a means of stimulation. Protect the surface of the body from sudden exposure to cold and apply hot applications over the precordium to stimulate cardiac action. External appliance of heat, preferably hot water bags, is very useful. If these measures succeed the patient should not be allowed to stand or move too suddenly. He must not be allowed to stand until he has gradually been accustomed to sitting upright and when he takes his first step, if the slightest sign of faintness occurs he should be placed in a reclining position and proper stimulation applied to avert the threatened return of cerebral anemia. Smelling salts are often valuable, but the most important stimulant to use during first aid is aromatic spirits of ammonia in 0.5 dram doses with three ounces of hot water. Alcohol is unreliable as a stimulant on account of its secondary depressing effect, and should never be used, especially in cerebral conditions.

Further medication depends upon the conditions present, with the following symptomatic treatment: Atropine, grain 1/150-1/75, subcutaneously alone or preferably with strychnine sulphate; 0.025 grain is a good means of resuscitation, when an increase of force and rapidity of the heart's action is desired. Or instead of the above digitalin 0.01 grain may be likewise given when tone and force of action of the heart muscle are wanting. Nux vomica in drop doses of the tincture every five minutes may be used; also to restore cardiac action in extreme cases of syncope, approaching heart failure and especially when of neurotic origin. This is promptly efficient. Inhalation of amyl nitrite in some forms of fainting, especially in anemic subjects or those with arteriosclerosis and a high blood pressure, speedily restores consciousness. Chloroform internally in doses of twenty to sixty minims is a very useful circulatory stimulant in hysterical fainting.

Patients who are subject to fainting spells and are under the observation of a physician should be treated along prophylactic lines. In ordinary syncope without any definite cause, advise the patient to see that the bowels move freely each day, and that the daily meals are eaten at regular intervals. In cardiac syncope not only regulate the diet, and prescribe stimulative medication, but advise against excitement or any sudden tax on the heart. Where gastric disturbances are evident a good combination as a stimulant, antacid and gastric sedative is found in the following:

R Aromatic spirits of ammonia,	5ss;
Sodii bicarbonatis,	gr. x;
Tinctura capsici,	℥iij;
Aqua (hot),	℥iij.

Sig.: One dose.

In hysterical conditions avoid all excitement and correct all abnormal living conditions. To my mind in anemic subjects, in cases of arteriosclerosis, and where there is evidence, by occasional fainting, of an impending apoplexy, no more gratifying results may be obtained in this annoying symptomatic syncope of the aged, than by the constant use of an organic iodine preparation. This is administered in ten drop doses in a wineglass of water one hour after meals.

(To be continued.)

Medicine and Surgery in the Army and Navy

CAMP HYGIENE AT THE FRONT. III.

By CHARLES GREENE CUMSTON, M. D.,

Geneva, Switzerland,

Privat Dozent, University of Geneva; Fellow of the Royal Society of Medicine of London.

In my two last communications I have briefly described the precautions of a material order that should be observed when establishing a cantonment. The measures referred to are of course influenced by the duration of the cantonment or trench occupation, but as the occupation continues they lose their effectiveness on account of the continual infection of the earth by various kinds of organic matter which each day impregnates it more and more profoundly until it becomes a real focus of infection in which pathogenic bacteria of every type grow. Now, in fighting that has been taking place so far the forced and prolonged sojourn in the same regions requires every possible measure for the prevention of epidemics which are continually a menace in all armies. The regimental surgeon must disinfect thoroughly and by every means at his disposal everything about the cantonment and by prophylaxis to limit all possible infection of the earth which has been trampled on, dug, and blown up as never before in the history of mankind. I shall now consider successively the preventive measures against infection of the earth, and afterwards the disinfection and sanitation of polluted or contaminated places, and will end with the special question of rat extermination.

To get rid of organic matter, that is to say detritus of every kind, including dead animals, two methods are at our disposal, namely, burying and incineration. The latter has taken an all important place since the beginning of the war. It is carried out by constructing crematory furnaces or better still, incinerators, which on account of their simplicity in construction has been the means of multiplying them according to needs. They are built by the troops themselves. The use of the incinerators has been constant and regular in the English armies since the beginning of the war and has been used in the British Colonial troops for some time past.

The simplest incinerator, commonly used in cantonments in India, is rapidly improvised and constructed. It is one metre and a half high above the surrounding ground and two metres in diameter. It is made with wet, sifted earth. The top is completely open (see Fig. 1). Four openings at the bottom at the ends of two perpendiculars are kept patent by thrusting in large tin preserve boxes with the bottoms taken out, and produce a good draught. All kitchen refuse and detritus of all kinds are constantly collected and incinerated in these furnaces. Others are constructed by building a rectangular structure of bricks from destroyed villages and laid in such a way that their superposition leaves an open space between each brick, thus forming walls with draught spaces (see Fig. 2). If possible, it is well to place some metal bars in the bottom of the furnace in order to act as a retaining shelf for the matter to be incinerated. Similar furnaces can be constructed with large, flat stones. The incinerators are kept in

constant use and since the material used in their construction costs absolutely nothing and their erection is so easy, every unit can have them. In formations at the rear where circumstances and materials are more favorable, the open air incinerator is always built with articulating bricks, a metal grill, a door and draught opening.

Besides the destruction of detritus the furnace is used for incineration of dead animals, particularly horses. For these, a trial of a number of months in the Sixth Army Corps has demonstrated that the incineration of a single animal is long and difficult, but the operation is simplified and becomes easier with each addition of dead animals in the same incinerator. Incineration is, unfortunately, not always practical, particularly in places where smoke must be kept from the enemy's sight, so that burying must be resorted to. Ditches for excrement and other filth are dug in different parts of the cantonment and receive the same rigorous disinfection as often as is necessary, as in the case of outhouse ditches. In any case this must be done at least once a day. It is in the trenches that the ditches for filth must be especially superintended and kept in proper condition and they should be located at the end of an angular offshoot of a trench just as is done for outhouses. In one army corps burying animals between two layers of manure has been tried with success, I believe. Urinals must also be established both in cantonments and in trenches in order to protect the ground from being soiled with urine, because the men will not take the trouble to go to the outhouses. The regimental surgeon must also supervise the hygiene of the stables and the transportation of manure to a distance sufficiently far off from the cantonment, as well as its destruction by fire in case it is not utilized. If the manure is to be used for agricultural purposes it can, without any detriment to its qualities, be deodorized in order not to attract flies.

Often sanitation of villages must be undertaken upon the arrival of a unit for cantonment. Manure will be found in front of many houses and it is often most difficult to find sufficient carts for transporting it away and afterward to disinfect and stone over the filth areas. In stables, the liquid manure must be drained off into ditches which are disinfected daily. In the fight against the multiplication of flies, it should be known that the insect lays its eggs preferably in fresh dung impregnated with urine; they do not lay their eggs on dung more than twenty-four hours old. Rouland has calculated that from June to September, one cubic metre of manure produced from 160,000 to 200,000 flies. It is known that the larvæ are very sensitive to the action of heat and that a temperature of about 50° C. is sufficient to kill them. Therefore, Rouland advises the utilization of heat developed by fermentation of the manure for their destruction. All that is necessary is to put the fresh dung into the midst of a manure heap, instead of depositing it on the surface. This procedure is of great efficacy. Among other preventive measures may be mentioned the stoning over or covering in with earth places used for urinating,

but this must be done before they have become transformed into mud.

Regardless of all the precautions for destruction of organic matter and the proper supervision of the soil, there still remain a certain number of places where daily disinfection is absolutely necessary. In this respect I would particularly insist upon the disinfection of stables which are real fly manufacturing. The walls should be given a coat of whitewash and their area disinfected in the manner to be described. The approach to the kitchens where organic waste matter always accumulates should be carefully supervised and the surrounding ground frequently sprayed with a solution of cresyl. The various disinfectants employed are cresyl, lime, chloride of lime, crude petroleum, schist oil, and ferric sulphate. It is very essential to understand the use of these various products. The use of lime, chloride of lime, and cresyl, five per cent. solution, is well known. Schist oil, which is light enough to remain on the surface of liquids, has, therefore, an asphyxiating action on larvæ, while at the same time it drives away flies by its special odor. Oil of coal with sodium resinate added furnishes, when it is mixed with water to the amount of 2.5 per cent., a stable emul-



FIG. 1.—Indian incinerator furnace.

sion which will give a light layer of oil sufficient to cover very large surfaces of matter undergoing decomposition. With Vermorel's atomizer this solution can be sprayed about a cantonment, trench, or fighting zone. With a liquid carbonic acid high pressure apparatus, the jet of this mixture may reach eight to ten metres, so that objects requiring disinfection situated a little distance from the trenches can be sprayed without attracting the attention of the enemy. Coal tar can be combined with ferric sulphate. Coal tar alone is not suitable for outhouse ditches because on account of its weight it has no action on larvæ on the surface of the feces.

I shall now turn to the very important question of rat extermination. The plague is propagated by the bites of rat fleas, a fact that has been known for some years and since the war, by upsetting towns and villages, the dispersion of rats has become quite general in certain districts. Raticides are either toxic or mechanical in nature. The latter consist of traps, snares, and dogs, but unfortunately, these excellent means do not produce a great destruction of these terrible rodents because the animal dies outside of its burrow. There are good rat dogs whose daily death roll will attain fifty rodents, but traps give poor results. The toxic procedures have the advantage of being much more active, but their inconvenience is that they cause the animals to die at the bottom of their lairs from which such a fearful

stench arises that it is often impossible to remain near by. As between the two evils, the lesser must be chosen; "deratisation" is actively carried out throughout the entire front. The different war zones are methodically divided into sections and subsections which are traversed by special sanitary squads for rat extermination.

Four procedures are in use and these I will rapidly describe, at the same time giving their relative value and contraindication in certain circumstances. The Pasteur virus is made with the *Bacillus typhi murium*, type D, an intermediary between the *B* paratyphoid and Gaertner's *Bacillus enteritidis*. Therefore, this virus is absolutely contraindicated in places where the poisoned rodents can come in contact with food which is to be eaten uncooked. The virus is furnished to the French army in cultures on gelose in tubes or sealed ampoules. The contents of a tube are diluted in 100 cc. seven per cent. salt water. Broth is then made with 300 grams of meat without fat and fifteen grams of peptone per 1,000 c. c. Bait consists of one kilo of bread or three kilos of grain for each 1,000 c. c. of broth.

Toxic extract is composed of scillitin, a glucoside extracted from fresh squill onions. It kills rats at the dose of 0.1 to 0.05 mgm. and having a bitter taste, dogs, cats, and man will not touch it. When kept in contact with the atmosphere it retains its raticide properties for about two months. One bottle is enough for 500 metres of trenches or 500 square metres for inhabited land. One c. c. will do for five to six grams of bait. To prepare the bait the contents of one bottle are poured into a large bowl and two litres of boiled sweetened milk are added. Broth can be used instead of milk. Dry bread is cut into small squares, counting about one kilo of bread for one litre of the liquid, three kilos to a litre of the toxic extract. The bread is well stirred in the liquid and the bait should be used the same day it is made. Every bottle of the extract must be used on the day it is opened.

The third raticide is a phosphorated paste. Mix 750 grams of flour in an equal amount of water and add eight grams of white phosphorus in small bits. Stir until solution is complete. Add 150 to 200 grams of melted fat. The fourth and last raticide, less often employed than the foregoing procedures, is sulphide of carbon. The drug is poured on a tampon and this is plugged into the rat's hole. All the dead rats found are buried in quick lime.

Let me add that the Germans have greatly contributed to the extermination of rats in French

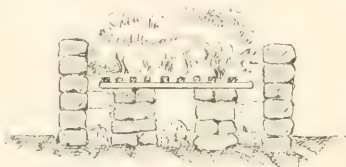


FIG. 2.—Incinerator furnace.

trenches by the use of their asphyxiating gas. In one section at the front the ground was covered with dead rodents, the only victims of the Huns on this occasion.

THE PHYSICAL CONDITION OF AMERICAN MEN OF MILITARY AGE.

Based Upon the Records of the Recruiting Offices of the United States Army.

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Every successful business man takes stock at frequent intervals. He counts his goods, determines his liabilities and assets and finds out just where he stands. As a nation, it is true that we have from time to time made inventories of our resources such as coal, oil, timber, and fisheries, but never has there been an inventory of the nation's most valuable asset, the health of the people. Examinations of drafted men, tabulated and published, will give us an idea of the physical health of the male population between the ages of twenty-one and thirty-one years. Until these shall have been published it may be of interest to study the records of the examinations of applicants for enlistment in the regular army. For this group the age limits are from eighteen to forty years.

In Table I are shown the causes of rejection and the rate per 1,000 for each cause both for the white and colored candidates examined during the period from January 1, 1912, to December 31, 1915. These data are based upon the examination of 164,797 men of whom 153,705 were white and 11,092 colored.

TABLE I.

CAUSE OF REJECTION OF APPLICANTS FOR ENLISTMENT IN THE REGULAR ARMY FROM JANUARY 1, 1912, TO DECEMBER 31, 1915.

Disease	White	Colored	Total
Veneral diseases	169.7	279.9	108.4
Heart disease	01.3	75.0	90.2
Defects of hearing	87.2	41.9	84.2
Defects of vision	72.2	38.8	70.7
Flat feet	55.7	44.8	55.0
Alcoholism	34.1	7.8	32.4
Hernia	31.4	42.3	32.2
Diseases of organs of locomotion	29.4	19.7	28.7
Diseases of the genitourinary system	25.4	23.2	25.2
Diseases of the respiratory system	25.2	15.7	24.6
Underweight	22.3	17.0	21.0
Defective teeth	21.4	22.8	21.5
Diseases of the skin	20.4	21.0	20.5
Defects of development	19.5	17.2	19.4
Tuberculosis	19.2	12.8	18.8
Weakened mind	15.2	7.2	14.8
Nervousness	14.4	10.7	14.2
Diseases of the nervous system	13.7	8.1	13.4
General diseases	12.4	3.8	12.0
Curvature of the spine	9.6	13.1	9.9
Hemorrhoids	5.9	9.8	6.2
Diseases of the digestive system	6.1	7.2	6.2
Varicose	4.8	5.2	4.8
Physical debility	4.5	2.2	4.3
Overweight and obesity	2.9	4.2	3.0
Under height	2.7	3.7	2.8
Diseases of the circulatory system	2.4	0.9	2.3
Over height	0.3	0.0	0.3
Others	31.1	20.0	31.0

Veneral disease is the greatest cause for rejection, and reports from the cantonments where the national army has assembled indicate that a large number of the men had these diseases when they arrived at the camp. It is probably true that venereal diseases cause the greatest amount of sickness in our country. We must face this squarely and

bend our energies toward their eradication. Since we know the cause of these diseases and their mode of transmission, we shall eventually be able to prevent them. Heart disease stands second on the list and this, too, is to a certain extent preventable. The same applies to defects of hearing and defects of vision which are third and fourth on the list. Flat feet is fifth on the list, but it should probably stand higher, as many with this defect in a moderate degree are passed into the service. Most of them are later discharged because the condition of their feet precludes their doing their full duty. Contrary to the general opinion the colored men seem to have this deformity in less degree than the whites.

Defective teeth stands twelfth on the list but they should occupy a much higher place if we classed here all who have cavities in their teeth. To pass the examining officer it is only necessary for a candidate to have two opposing molars on each side, and bicusps are counted as molars. My personal observation has been that very few men have perfect teeth. These facts should increase our efforts toward securing adequate dental treatment for school children. Tuberculosis is fifteenth on the list, but it is probable that many who had that disease were rejected by the recruiting parties because of poor physique or underweight and were never examined. Next to tuberculosis we find weakness of mind with an average of 14.8 per 1,000. This is a grave state of affairs because we all know that had the examination been more thorough a much larger number would have been classed as feeble-minded. With 1.5 per cent. of the population of military age feeble-minded we should surely be alarmed.

In Table I many of the entries are in general terms and are taken from the reports of the Surgeon General representing conditions that obtain during peace and are not entirely applicable to war conditions when a better class of men apply for enlistment. I have therefore prepared Table II which gives the data for the recruiting station at Fort Ethan Allen for the period from April 12, 1917, to September 30, 1917. Although the number of men examined was between 4,000 and 5,000 many of them were reservists who were already enlisted and the data for them is not included because in such cases the weaklings had been rejected before they arrived at the fort. The 2,033 men included here came from eastern New York and western Massachusetts. They had all been seen by a line officer before arrival at the depot and those with obvious defects had been rejected.

TABLE II.

CAUSE OF REJECTION AND PERCENTAGE FOR EACH CAUSE FROM THE EXAMINATION OF REAR APPLICANTS FOR ENLISTMENT IN THE REGULAR ARMY MADE AT FORT ETHAN ALLEN, VERMONT, APRIL 12-SEPTEMBER 30, 1917.

Disease	Percentage rejected
Alcoholism	20.0
Heart disease	13.0
Defects of vision	11.0
Defects of hearing	5.8
*Defective teeth	5.2
Veneral diseases	5.2
Defective mind	4.7
*Tuberculosis of the lungs	3.6
Goitre	2.6
Under weight	2.6

TABLE II (Continued).

Disease	Percentage rejected
*Gonorrhea	2.6
Undescended testicle	2.1
*Pyorrhea alveolaris	1.6
Under height	1.6
Nervous diseases	1.6
*Defective vision	1.6
*Syphilis	1.0
Tumors	1.0
Epilepsy	1.0
Phimosis	1.0
Hammer toe	1.0
*Hallux valgum	1.0
Ichthyosis	1.0
Cataract	0.5
Blepharitis	0.5
Iritis	0.5
*Blindness	0.5
Tachycardia	0.5
Varicocele	0.5
Deviation of septum	0.5
Pleurisy	0.5
Orchitis	0.5
Gastric indigestion	0.5
Old scar following appendix operation	0.5
Underdeveloped	0.5
Pendulous abdomen	0.5
*Ingrowing toenail	0.5
Depressed fracture of head, old	0.5

*To a certain extent preventable.

Almost all the troops examined at Fort Ethan Allen were white. In order to make Tables I and II comparable the values in the latter should be multiplied by ten. In Table II heart disease occupies the first place. Without exception the men rejected for that cause were entirely unaware of their condition. Many of them were engaged in occupations that would aggravate their trouble. Flat feet stands second; had all cases of this deformity been excluded it would have been first. The men with this deformity who were passed were later placed under treatment resulting in a cure in many instances. Venereal diseases caused the rejection of 3.6 per cent. of the men. In these cases the disease was obvious but had Wassermann tests been made it is probable that a much larger number would have been rejected. Tuberculosis also caused the rejection of 3.6 per cent. of the men. At this station I took especial care to detect cases of this disease, and although the men were examined very rapidly, as far as I know no man passed by me was later rejected by the board of experts who examined the entire command for that disease. In addition, 3,036 soldiers were examined under my direction for throat defects; 14.5 per cent. had enlarged or diseased tonsils.

As a result of my recent experience in the examination of recruits I am more than ever convinced of the great importance of semiannual physical examinations for all adults. I am also impressed with the need for more careful supervision of the physical wellbeing of the school children. Not only should we have careful physical examinations of each child each year but these examinations should be immediately followed up by appropriate treatment and training. This is no longer a local question to be decided by the unthinking voters of the community but is a national problem upon the solution of which depends the virility of our race.

TRENCH DISEASES.

BY JOHN E. LIND, M. D.,

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(Continued from page 124.)

TRENCH FOOT.

Description.—We have found in the two conditions we have just been discussing that the affected soldiers were debarrd from duty for varying lengths of time, in some cases of trench nephritis permanently, but the ailments themselves caused little or no suffering, generally speaking. When we come to the consideration of trench foot, however, we find an altogether different situation. It has been recognized since the dawn of history that the care of the private soldier's feet was one of the most important things to consider in waging war. Formerly the problem was largely one of protecting them on long marches, for the general who could move his army across country the most rapidly was the one who won the most battles. It is otherwise now. Armies are mobilized by rushing them here and there on railroads and it is rare for large bodies of men to have to march day after day across country. A still more serious problem, however, has taken the place of the old one. In trench warfare the soldier is obliged to stand or move within a narrow radius for many hours with his feet in cold water, liquid mud, snow decaying vegetation, etc., conditions peculiarly favorable to frostbite, chilblains, etc. It is small wonder, then, that in the present war, the military surgeon soon began to be overwhelmed by cases of diseases of the foot which soon received the name of "trench foot." This seems to be nothing more nor less than frostbite of the feet, caused by external cold and disturbances of peripheral circulation, the former supplied by the water, mud, and snow, etc., in the bottom of the trenches and the latter caused by standing still and by constriction of the extremities.

Etiology.—It is pretty generally agreed that liquid cold is the most important single cause. Prolonged exposure to a moderate degree of wet cold, combined with compression of the feet, are conditions favorable to the development of trench foot. Rischpler has shown experimentally that the phenomena present are due to inflammation caused by the cold. Remaining motionless in liquid mud or melting snow and allowing the feet to become adequate protection. McNeil elaborates this cause reported the case of a concrete worker in England who showed all the symptoms of trench foot. He had an old injury of the foot with cicatricial tissue and had been working in cold and damp without adequate protection. McNeil elaborates this cause by saying that long exposure to wet causes the horny layers of the skin to dissolve, osmosis occurs, and the subcutaneous tissue becomes distended with diluted plasma, thus causing an abnormal degree of pressure on these parts. Longridge holds that wet is the chief cause in that it causes the electrical resistance of the skin to be diminished so that there is a gradual leakage of electricity from the skin to the earth. As such leakage occurs more readily from points than from plane surfaces the toes

suffer most. By this electrical loss the foot tissues lose their trophic influence and die. This ingenious speculation gave rise to a lively controversy in the English medical periodical where it was published. Leonard Hill objected to the theory on the grounds that if immersion in water had such an effect why was it not injurious to fishes, fishermen, and long distance swimmers? To which Longridge replied that fish were protected by a natural dielectric mucus, that fishermen were not exposed to wet for long periods, and that long distance swimmers were in the habit of coating their bodies with oil before immersion. Carruthers made the objection that rice growers worked all day long in water, to which Hernaman-Johnson replied that in rice growing climates the temperature was higher, and besides coolies were well known to be able to adapt themselves to insanitary environments. The last mentioned writer went on to say that while leakage of electricity might not be the direct cause, it might interfere with the local nervous mechanism for heat regulation and he thought the oiling of the feet recommended by Longridge certainly of value.

Several writers have advanced the theory that trench foot is an infection. Raymond and Parisot champion this theory. Hughes states that the liquid mud which gets in the boots is very infective, being laden with decaying organic matter, and when this is brought in contact with the soldier's feet, the resistance of which has been lessened by fatigue and by toxic products collecting in the extremities, an infection occurs. Raymond and Parisot claim to have isolated the infective agent, a mould, *Scopulariopsis koningii*, which is found in the mud of the trenches, and which penetrates the feet at the site of the grooves at the side of the nails or through excoriations of the skin. However, Captain G. Richardson has examined bacteriologically large numbers of cases of all grades of severity and failed to find any but the usual organism.

Next to wet and cold, constriction of the feet themselves is the most important factor. This may be why wrinkles in the socks, ill fitting shoes, garters, puttees, or anything which impedes circulation, favors the development of trench foot. Blackman says that all cases he observed were hyperidrotics, but this view is not supported with any great weight of opinion. Hughes found what he believes to be the chief cause in the fire step of the trenches. Here, he said, the men sat for long periods or even slept, with the hard, sharp edge of the step pressing against the popliteal space and cutting off circulation. This may no doubt be responsible for many cases, but it is included when we say that anything which causes pressure or constriction of the lower leg or foot may cause trench foot. Fatigue and lack of warm food may act as contributing causes.

Pathology.—The pathology appears to be very similar to that of frostbite. The changes observed are those of inflammation going on to gangrene if not checked. Hughes gives three stages: congestion, coagulation, and gangrene. There is an initial constriction, the circulation is impeded, the tissues swell and become painful, fluid exudes into them, there is infiltration with leucocytes, and last necrosis. The damage to the bloodvessels appears to be

the chief pathological feature, as Smith has shown by experiments on rabbits. It has been held by Raymond and Parisot that the condition is due to a fungus which produces a mycetoma of the foot, resembling Madura foot, but if such cases exist they must be exceptional. Mycetoma, a fungus disease of the foot, also known as Madura foot, is caused by a spore bearing mould, *Madurella mycetomi*, discovered by Laveran in 1902. This is endemic in India, sporadic in other tropical countries and has been seen in Canada. It has no habitat outside the human body, to which it obtains access by a slight wound, a scratch is enough. Thus the barefoot natives are prone to it. The initial focus gradually becomes surrounded with a zone of proliferating cells and fibrous tissue which gradually dissolves the tissue. There is a localized tenderness, followed by inflammation, the arch of the foot becomes obliterated, the soft parts are always invaded early and later the bone. In from six months to two years a sinus appears discharging seropurulent fluid and in from two to ten years the foot becomes a pulpy mass. There is no pain or constitutional disturbance, and it is difficult to see in this condition any resemblance to the typical trench foot.

Symptomatology.—Three or four stages are usually described. Oswald Smith gives four: 1, the neuritic stage, with acute pain, but no swelling or discoloration; 2, an edematous stage, without discoloration, in which the pain continues acute; 3, an edematous stage with blisters, in which there is varying discoloration of the skin, short of gangrene; and 4, the gangrenous stage, with edema and blisters and reddening of skin involving the lower leg.

The first signs, it appears from all accounts, are numbness and swelling. The foot feels as if it had gone to sleep and the boot fits tightly. The soldiers often say that they feel "pins and needles" in the feet. Next the foot becomes very painful, there is a sense of tightness, and the men may complain that they feel as if they were "walking on stilts." Next the feet become red, tender, hot and swollen; later the heat goes out of them and they feel cold to the touch, "like a solid rubber ball." There is no pitting. In this stage there is a loss of resistance to pressure, rarely pain, and the circulation is extremely sluggish. The swelling never extends above the ankle. If then the condition progresses toward recovery the swelling and numbness decrease, but the pain increases until it becomes agony. Other cases may go on to gangrene.

Tetanus is not infrequent complication. Lumière and Astier report that, out of ninety cases of tetanus received in the Lyons Hospital since the beginning of the war, in five the disease followed frostbite of the feet. Davis and Hilton report a fatal case of tetanus in trench foot. Bruce says that tetanus often follows trench foot and has reported this year fifteen cases, in eight of which he had a complete history and six were fatal.

Treatment.—The best treatment is preventive, and consists in protecting the feet from wet and cold and constriction. Leonard Hill says that standing in mud is better than in running water because in the former case a little heat is retained about the

feet. Garrod says massage is very important in the prevention, and recommends rubbing with whale oil, antifrostbite grease, or a mixture of lard and mustard until the feet are quite dry, then dry socks, then gum boots up to the thigh; this is to be repeated every twenty-four hours. McNeil recommends goose grease rubbed into the skin freely; Longridge favors any thick oil or dielectric ointment to prevent leakage of electricity. Parisot says rub the feet once or twice a day and put on dry socks; do not sit or stand still any longer than is necessary, make the bottom of the trenches as dry as possible and while in camp take great care of the feet. Letulle gives practically the same advice; he advocates drains, cesspools, broken stones, timber or brush in the trenches, and says the shoes should be removed for about ten minutes at least once a day, during which time the feet and lower legs are rubbed and the toes and feet are worked backward and forward.

Blackman recommends a dusting powder of French chalk and zinc oxide, rubbed down with a few drops of formaldehyde and applied to the feet inside the socks; he also advocates painting the feet with a solution of formalin, on the theory that hyperidrosis causes the condition. Raymond and Parisot say the feet should be cleaned and disinfected thoroughly whenever possible. They favor alkaline and borated washes. Smith recommends shortening the time spent in the trenches, massaging the feet before entering them and between turns, and increasing the clothing of the legs, but not the feet. Hughes says the soldiers should take rests with the legs elevated whenever possible, they should have plenty of blankets and warm, nourishing food; Blackman also recommends a diet rich in nitrogen.

It is pretty generally recognized that the ordinary army boot, even if greased with tallow or tallow mixed with neatsfoot oil (Letulle), is not sufficient protection against trench conditions. Most writers have advocated two pairs of socks with the caution that they should fit smoothly and not wrinkle, also a dry pair of socks carried in the pockets. Besides these, military surgeons have been casting about for a boot or "wader" which will offer adequate protection. Leonard Hill recommends the Labrador boot, which is fashioned from elastic, watertight skin in three layers which hold in the dry, warm air, in marked contrast to the regulation boots. Ewart had devised a bag which in his published article he did not describe fully for military reasons, but the principle was to furnish heat to dry wet boots and leggins and also apply external heat to the abdomen and spine. The *Académie de Médecine* of Paris recommends paper under two pairs of socks, and large boots. Sharpe advocates two pairs of easy fitting socks, pliable leather boots with plenty of room so that the foot is not cramped and the toes move easily or, if necessary, high rubber boots to the knee and, if the water is known to be high, "waders." The most successful contrivance seems to be a sort of stocking devised by, and named after a Frenchman, Delépine. He made a series of experiments of the effects of wet cold on the feet and, in 1915, devised a preparation of thin, soft oil silk by using an oxidized linseed oil. He

devised what he called "antifrigor" bags to be worn inside the boot; these were recommended editorially by the *Lancet*.

If trench foot has actually begun, however, it is very important to start treatment at once. The men should be encouraged to report the first feeling of numbness, and regular inspection of the feet should be made. Ellis recommends nitroglycerin in the early stages to dilate the peripheral vessels and increase the defective circulation, combined with a little strychnine. This is admirable theory, but we doubt if it would have much effect except in a stage earlier than the condition is actually seen, and anyway sole dependence should not be placed on it. He recommends also electricity, first anodal galvanism, later the same interrupted twenty times a minute, and later faradism. Hughes recommends rubbing in the first stage. Gray suggests the use of thyroid extract on the same grounds that Sir Lander Brunton suggested it for chilblains, but he admits he has had no chance to try it.

All observers agree that antitetanic serum should always be given early in the disease, exactly as if one were dealing with a wound (Bruce, Davies, Hilton, Ewart, Lumière, Astier, *et al*). There is also an almost universal warning against applying heat too quickly. The famous Larrey laid stress on this a century ago. Smith says we must be very careful about the application of heat when the limbs are returning to normal, for fear of causing necrosis. The *Journal of the American Medical Association* says the same editorially. Hot, nourishing food is recommended for all men in the trenches, but especially when they show the first symptoms of trench foot. Recently Major Philip Turner has reported good results with the passive hyperemia method of Bier. He describes its application as follows: The feet are very carefully washed with ordinary soap and water and the nails cut and cleaned; they are then painted over with a solution of one per cent. picric acid in methylated spirit, and this application is repeated, at first daily, and later on alternate days. Where there is subacute or chronic inflammation he applies a constricting bandage just above the knee, tight enough to prevent venous return, but not arterial flow. The first day this bandage is kept on eighteen hours, is then taken off for six hours and then reapplied for twenty-two hours; after the first application it is kept on twenty-two hours out of every twenty-four. Turner reports good results with this method.

For severe pain of the second stage of trench foot, which becomes almost unbearable when recovery is taking place, many measures have been suggested. Hughes speaks well of electrical massage; Ellis recommends galvanism, later faradism. Gordon gives seven measures, some one of which was nearly always found effectual in relieving the pain of this stage: 1, rubbing; 2, galvanism; 3, hot fomentations over a coat of belladonna; 4, laudanum on flannel; 5, radiant light and heat; 6, whirlpool baths; 7, local hot brine. He found further that harm was apparently done by the application of hot water or by walking on the tender feet. Smith also warns against premature use of the feet.

The salicylates have been recommended by many

writers for the pain of trench foot. In order to arrive at an accurate estimate of their value, Gordon selected fifty-nine cases, giving the salicylates to twenty-seven, and using the other thirty-two for control. He summarized his results as follows: All these men had pain on admission; three days later the men who had been placed on salicylates showed some improvement which continued. He also observed that patients which had been on salicylates and were deprived of them for twenty-four hours felt worse; that if a severe case not receiving salicylates was put on them, in three days most of the pain disappeared; that if men who were not on salicylates were given aspirin occasionally when they complained of unusual suffering they were relieved by it. His method of administering the salicylates was by the following formula:

R Sodii salicylatis, gr. x;
Spiriti ammonii aromatici, ℥xv;
Tinctura cinchoidis compositi, ℥xx;
Syrupi aurantii, ʒss;
Aque, quantum sufficit ad ʒix.

Sig.: Every four hours until pain is slight, then three times a day.

Several writers, notably Oswald Smith and Ewart, have recommended the subcutaneous injection of oxygen if the condition proceeds beyond the first stage. The theory of this therapy, as given by Smith, is that trench foot is very similar to Raynaud's disease; there is an edema which produces stasis, hindering the circulation. The introduction of oxygen by multiple puncture into the subcutaneous tissues causes oxidation of the venous blood, keeping the tissues alive, the serum is driven out slowly but surely through the puncture holes, and the pressure on the bloodvessels is relieved. The apparatus required is a Woulfe bottle, with two glass tubes bent at an angle and inserted into a tightly fitting cork. To the end of one glass tube is fitted three yards of red rubber tubing, connected with the usual oxygen cylinder, to the end of the other glass tube is fitted two yards of a fine rubber tube, and the distal end of the tube has fitted to it a salvarsan needle. The bottle contains a saturated solution of sodium carbonate.

The technic is as follows: The needle is sterilized in boiling oil. The sites of the proposed punctures are painted with iodine. The needle is first inserted into the subcutaneous tissues at a point midway between the heel and the external malleolus. If the toes are black and cold another insertion is made at their base in the midline. The oxygen must be injected slowly. Any blisters which may be present are treated by passing sterilized thread through them by means of a straight surgical needle, allowing the thread to remain as a drain. Afterwards lint is saturated with a one per cent. solution of picric acid and applied as a compress to the foot. On the day following this treatment it is common to find the lint saturated with serum, the skin of the foot dry and wrinkled, and the foot itself warm, even the toes. The most striking results are seen in the relief of pain and the consequent promotion of sleep; the tibial pulse is increased and there is no fever. By this method the destruction of parts is greatly lessened and in some severe cases complete recovery occurs. Smith

warns us, however, that recovery will be slow in gangrenous or semigangrenous cases. The cost of the oxygen treatment, he says, is small.

To summarize the treatment then: The best is preventive by protecting the feet from cold, especially wet cold, and avoiding constriction or compression of all kinds. A man should wear two pairs of well fitting socks on the feet, and be provided with an extra dry pair. He should have flexible, well fitting boots, or watertight boots if necessary. Rest and massage the feet at least once a day. Exercise and warm, nourishing food are necessary. Keep the bottom of the trench dry. Give tetanus antitoxin at once if trench foot appears, and repeat every seven days until wounds are clean. Do not apply heat. Relieve pain by local applications, electricity, the salicylates or, if necessary, opium. Give subcutaneous injection of oxygen in severe cases.

(To be concluded.)

PROBLEMS OF COMMUNICABLE DISEASES IN TRAINING CAMPS AND CANTONMENTS.

By W. A. EVANS, M. D.,

Chicago.

Professor of Sanitary Science, Northwestern University.

The total death rate of the United States Army in 1916 was 4.45. The disease death rate of the army was 2.53; that of the navy was 4.48. These rates indicated that the health of the military forces compared more than favorably with that of men of the same age periods in civil life. The reports which came from the armies in the field in northwestern Europe indicated that the death rates from disease in this war, instead of being twelve times as high as that from wounds, as in some wars, or even four times as high as in most wars, would be fewer than those from wounds. Such reports as it were possible to get from Germany and England indicate that the disease death rate will be lower than that in the Franco-Prussian War or the Russo-Japanese War, the two wars in which the proportions of deaths from disease to deaths from wounds were notoriously low. Among the accomplishments of this war were to be noted the great reduction in tetanus due to wounds; improved treatment of burns; possibly a specific for infections by gas bacilli; control of enteric disease, especially, typhoid, paratyphoid, cholera, and typhus. Among problems remaining to be solved were those due to tuberculosis, trench fever, trench foot, trench jaundice, war nephritis, shell shock, and gas poisoning. Possibly, also the European armies have been unexpectedly unable to cope with malaria.

Doctor Evans said he would confine himself to the problem of keeping healthy the men in training in cantonments in various parts of the country.* An editorial in the *United States Naval Medical Bulletin* for July, 1917, contained this statement: "Face to face with the enormous menace of the civilian population to our military service, when the former begins to flow in considerable bulk into

*Abstract of a paper read before the American Public Health Association, at Washington, D. C., October 5-10, 1917.

the latter, we must prepare to meet the inevitable and contend against it as best we can." The necessity for protecting the training camps against the diseases of their environments was his main theme. The four diseases, measles, mumps, meningitis, and pneumonia, and the group of disease, the so called venereal diseases, were sources of great disability and damage to military commands, especially when in training, and, so far as control was concerned, each was neglected by State and local health departments. So far as the men in training were concerned, we could dismiss from thought all the diseases that could be vaccinated against. We could put aside all water borne diseases, and other diseases due to infection through the gastroenteric tract. We could put aside typhus; also diphtheria, since only about twenty per cent. of soldiers were susceptible.

Measles was one of the most disabling of diseases for men in training according to the surgeon generals of the army and navy. The surgeon general of the army said: "Given the proper combination of season, crowding, bad barracks, etc., in a command of recruits, an epidemic of measles is more to be feared than smallpox." Munson, as a result of the experiments of the army on the border in 1916, said: "Measles is a thoroughly preventable and controllable disease." Epidemic measles hereafter should be a reproach to the commander or medical officer concerned, a reflection on their efficiency and a cause for official investigation and discipline. Doctor Evans was firmly convinced that the long accepted classification of measles as one of the eruptive fevers put it in the wrong nosological category. It should be classed as an acute respiratory disease. The methods used by Munson in his very successful work were those usually accepted. The trouble in practice in civil life was that they are not rigorously administered.

Attention was called to the advantage of having a register of the history of measles, German measles, and mumps. In a military command this should be in the keeping of the captain; in a school, of the teacher. It was suggested that mumps was primarily an inflammation of the mouth, and that the involvement of the parotid was secondary. In consequence, examination of the mouth should be a routine daily procedure in every camp that had been invaded by mumps. A blood count made at the onset of the fever by showing leucocytosis and lymphocytosis made possible a diagnosis of mumps before swelling of the parotid. Hess had shown that susceptibles could be made immune by the injection of the blood of persons who have had mumps. Attention was called to the statements made by Nicoll in reporting an epidemic of pneumonia at Fort Bliss in 1916: 1. Epidemic pneumonia was to be expected in large camps in the winter months. 2. The disease was principally due to pneumococci of types I and II. 3. Direct evidence of tent, company, and regimental contagion had been obtained. 4. Vaccination was considered a more promising measure of protection than isolation. Lister reported good results from vaccination against pneumonia in South Africa. Troops quartered in certain sections of the country soon after the Civil War carried meningitis there, and the dis-

ease has been made mildly endemic since. Meningitis was especially a disease of soldiers living in barracks. Parkes, Rolleston, and the London *Lancet*, editorially, informed us that meningitis had been completely controlled in the British army and navy. The method used by them consisted in bacteriological examination of the noses of all recruits and of all contacts and cases, isolation of those found infected; sterilization of all infected noses. Each of the four diseases named is the result of infection through the nasopharynx. They were all closely bound up with colds.

Our troops in training, we had every reason to believe, would not suffer greatly from poor sanitation. Just as we were getting sanitation on a satisfactory plane, need for it was in a great measure removed by the general use of typhoid and paratyphoid vaccine. The time had come to give to methods for the prevention of diseases contracted through the nasopharynx as much attention as was given to those for the prevention of diseases contracted through the intestines. This would include plans against measles, mumps, meningitis, and pneumonia as already outlined. Doctor Evans suggested that to each command there be attached at least one comfort officer. It would be the duty of such man or group of men to watch over ventilation, heating, overcrowding; to see that the men had plenty of blankets and enough clothes; to see that the cold rate was kept down, for in the wake of a high cold rate there was apt to come an epidemic of measles, mumps, meningitis, or pneumonia.

The disability rate from venereal disease, both in training camps and in men at the front, is higher than any other rate. The Germans and Austrians estimate that of the venereal disease in the men at the front five per cent. is contracted at the front, twenty per cent. on the lines of communication, and seventy-five per cent. outside the sphere of the army. The troops in training could not be kept reasonably free from venereal disease except there was the fullest cooperation between the authorities of the camps and those of the surrounding communities. He suggested that a norm for venereal disease be established. Possibly a sickness rate of 0.5 per cent. from venereal disease would be right. Whenever this rate was equalled or surpassed, the military authorities should redouble their efforts at moral, educational, mental, and medical prophylaxis. The health departments of surrounding communities should provide dispensaries, and where necessary, hospital beds for the treatment of venereal disease. They should provide laboratory facilities for diagnosis and free salvarsan or other specific medication. The police department should repress prostitution. The philanthropic societies should do all the necessary health and police work that might not properly come within the jurisdiction of the health and police departments.

Patriotism, as well as a proper regard for the obligations of officials and for the duties of life by other health authorities, demands that the civil authorities make every effort and take all measures to render their communities safe for soldiers and sailors and civilians, against measles, mumps, pneumonia, meningitis, and venereal disease.

MEDICAL NEWS FROM WASHINGTON.

Surgeon General Braisted Makes a Statement on Navy Medical Department Activities.—Twenty Cases of Typhoid at Las Animas, Col., Naval Hospital.—Senate to Investigate the Available Number of Trained Nurses for Service with the Army.—Revised Edition of the Naval Hospital Corps Drill Book Being Prepared.—New Regulations on Physical Examination of Drafted Men.

WASHINGTON, January 28, 1918.

When Surgeon General William C. Braisted, of the navy, recently was before the House Naval Committee, he stated that the Medical Department of the navy has not failed to meet a single demand made upon it during the past year, and that without very much expansion the Bureau of Medicine and Surgery was able to take care of the war situation and to stand the test of a year of war conditions. He insisted that the navy has the finest military hospitals in the world, without exception. Doctor Braisted gives the Secretary of the Navy credit for promptly approving every request made for money and aid in developing the Medical Department when the war situation became critical. He was without funds for new construction, but Secretary Daniels authorized whatever work was needed and the cost was taken care of in subsequent deficiency appropriation acts. There has been no necessity to ask Congress for personnel increase, as that was provided two years ago on the percentage plan of 6.5 medical officers per 1,000 men. Automatically the required number of officers and men is available to the Medical Department whenever there is an increase in the naval establishment. Doctor Braisted also told the committee: "It is a most wonderful showing that we have to record, especially when you consider that the navy has been nearly a year at war. We practically went into this war with our forces on the first of February, when the order for mobilization took place. We put everything on a war time basis, and thousands and thousands of men were enlisted, and we have been working under war conditions for at least eight months, and even longer than that. Notwithstanding all that, with all the casualties that have taken place, and with the increase in personnel, and with the changing and varying conditions, and with the new young men, and the drownings, and everything of that kind to meet, I am able to tell you that for the year, under all these war time conditions, we have had less than a thousand deaths. We have had, with a personnel approaching 300,000, fatalities amounting to less than one per cent., in fact, about 0.37 per cent. for that number of personnel."

Doctor Braisted added a word of caution: "What I have told you covers the period from the beginning of mobilization to the end of the year. We have already passed through a very trying month, but there are still four bad months of winter and spring ahead of us, and it is not to be expected that we can pass through this period without some outbreaks of disease, when it is remembered that large numbers of men are still under training and that every training station is surrounded by foci of infection in the civil population, so you may hear at any time of an outbreak of one disease or another, but you may rest assured that the medical department is pre-

pared to meet all emergencies. The only thing that causes apprehension is the fact that training stations and shore stations generally are even now taxed to their utmost capacity. However, I hope an outbreak will not come."

* * * * *

Typhoid fever has become so rare a disease in the military naval establishment, due to the general use of antityphoid prophylaxis, that considerable surprise is occasioned by the news of some twenty cases of the disease at the naval hospital, Las Animas, Colo., where tuberculosis cases are treated. Of these twenty cases, nine were civilians employed about the hospital grounds and who never had been inoculated, and of that number two died, one of them being a Chinaman employed as a cook. Of the cases occurring among those of the naval service, five had received the antityphoid inoculation within a year, and all of them proved of light character. The disease was traced to outside milk supply. It also was found that some of the men drank water and had eaten watercress from a stream containing seepage.

* * * * *

Senator Trammel, of Florida, has submitted the following resolution, which was agreed to by the Senate: "Resolved that the Senate committee on military affairs be, and it is hereby, directed to investigate and report to the Senate at the earliest practicable date the available number of trained nurses for service with the United States army; and whether or not this present available number will be adequate for the needs of the army when increased by the anticipated future increments, taking into consideration the increase demand when the army shall more largely engage in active conflict; and to investigate and report upon the advisability of at once establishing training courses or schools for nurses for future service with the army hospitals; and to investigate and report what, if any, provisions have been made to this end by the War Department."

* * * * *

Passed Assistant Surgeon William A. F. Halsey, of the navy, on duty in charge of the newly established hospital corps training school at the naval operating base, Hampton Roads, Va., is engaged in preparing a revised edition of the drill book used by the naval hospital corps. This volume is the official textbook at the naval hospital corps training schools, as well as on board ship and in naval hospitals.

* * * * *

The regulations governing the physical examination of men summoned under the draft have been materially modified by the special board, composed of Colonel George E. Bushnell, of the Surgeon General's Office, Dr. Joseph C. Bloodgood, of Johns Hopkins University, and Dr. William Allen Pusey, of Chicago, which has had the matter in hand. Dr. John H. Quayle, of Cleveland, appeared before the committee and his suggestions have been adopted in part. Under the new regulations many recruits suffering from minor ailments will be accepted and sent to camp for treatment. It is understood also that the recruits with minor defects will be accepted for duty in special lines even if they are not physically qualified for service at the front.

Editorial Notes and Comments

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GENERAL GORGAS ON THE STAND.

The appearance on January 25th of the Surgeon General of the United States Army as a witness before the Senate Committee on Military Affairs, was one of the most dramatic incidents in the controversy which has arisen over the conduct of the war. He was placed in a very awkward predicament in that the chairman and several of the members of the committee were openly antagonistic to the Secretary of War, General Gorgas's superior, and to his methods. The regulations and the traditions of the service forbid the criticism of a superior by a subordinate. Much of the information desired by the committee constituted in effect a criticism of the methods which have been pursued by the Secretary, and to an unbalanced or less careful man than the Surgeon General, the opportunity to attack the Secretary would have been irresistible. Happily, however, the scientific accuracy and the military discipline of a lifetime enabled the Surgeon General to answer all the questions put to him without, at any time, transgressing the bounds set by his relations to the Secretary of War.

The evidence presented by the Surgeon General was largely a summary of the reports made by him to the Secretary during the latter part of November and the first part of December. The camp sites were said to be satisfactory from a sanitary point of view, and the sanitary routine of the camps was also good. The principal criticisms made by the Surgeon General were that the men were insufficiently clad for the season; that they were unduly crowded; that there was no provision made for detention camps where new recruits could be kept until the danger of their bringing infection into the permanent camps had passed away; that the hospitals were generally the last buildings in cantonments to be erected and equipped instead of the first; that there was an insufficient supply of trained nurses, which necessitated reliance on untrained orderlies; and that there had not yet been provided any hospital ships for the transport of the wounded soldiers of the army.

Notwithstanding these untoward conditions the death rate had not been much above the average. If the mortality continues at the present rate it will amount to about eight per mille. In civil life the mortality among men of a corresponding age is about seven per mille. Under peace conditions the mortality in the regular army is about five per mille. It will be seen, therefore, that there is a higher mortality than there should be, but that the difference is not so formidable as might have been supposed by the published criticisms. The unfortunate part of the matter is that this additional mortality seems to have been clearly preventable. The evidence of the Surgeon General proves that whatever fault there has been, no remissness has been shown by the Medical Department of the Army, that the best possible use has been made of the material provided, that there has been a sufficient number of surgeons, that these have, with very rare exceptions, performed their duties with knowledge, skill, industry, and good judgment, and that the surgeons who have constituted the few exceptions to this rule have been courtmartialed and are now undergoing trial with a view to the infliction of punishment suitable to their dereliction.

The soldiers and the citizens of the United States are to be congratulated upon having at the head of the Medical Department, so wise, so efficient, and so judicious an officer as Major General William C. Gorgas, and upon the enthusiastic support which his administration of the Medical Department of the United States Army has received at the hands of the medical profession of the country.

STUDIES UPON VITAMINE AND POLYNEURITIS.

The exclusive or disproportionate use of polished rice as an article of diet has been fairly well established to be a cause of polyneuritis and its related syndrome beriberi. It has also been shown that these conditions may be effectively ameliorated by administration of the vitamine contained in brewer's yeast. A further question has recently occupied investigators along this line. A. D. Emmett and L. H. McKim [The Value of the Yeast Vitamine Fraction as a Supplement to a Rice Diet, *Journal of Biological Chemistry*, December, 1917] have sought to discover the value of this therapeutic agent in convalescent subjects, or, otherwise stated, whether the polished rice diet supplemented by the yeast vitamine will not only prevent a recurrence of the neuritis, but whether or not it will have also as full a beneficial effect in complete recovery measured by body weight as some other diet known to contain the requisite amount of vitamins.

A number of pigeons were studied. They were fed first upon polished rice until they showed symptoms of typical polyneuritis, when they were treated with autolyzed yeast vitamine. After this they were fed upon one of the following diets: polished rice with vitamine, shelled corn, brown or natural rice, brown rice with vitamine, barley, unhulled oats, and hulled oats. As a rule the diet was changed when under any one the pigeon ceased to gain in weight. It was found that polished rice with the yeast vitamine as a supplement prevented a recurrence of the neuritis and caused a partial gain of weight up to a certain point of time. Brown rice alone showed good results in gain of weight, while with the addition of the yeast vitamine its results were the best secured. The yeast vitamine seemed to have here a stimulant effect beyond the normal effect of the vitamine already contained in the brown rice. Shelled corn proved also efficient, while barley and hulled oats showed fair results. Unhulled oats was unsatisfactory. It seems from these experiments that there are at least two vitamins which are lost in the polishing of the rice. One of these apparently has a curative power and it is in a vitamine related to the yeast vitamine that this power apparently lies. Yeast is therefore a partial supplement to a polished rice diet only. Another vitamine, which seems to stimulate weight, is found in the other foods, containing other vitamins which are therefore necessary for complete restorative results.

The yeast vitamine was administered in Lloyd's special fuller's earth or in ordinary fuller's earth made into tablets with a definite amount of lactose, these reagents being proved to have no effect upon

the polyneuritic attack or the subsequent gain in weight. The marked advantage of the brown rice diet over polished rice and the yeast vitamine may have been due in part to removal of phosphorus in polishing of the rice. This is a point which is being submitted to further study.

PSYCHOLOGY AND ANTISEPTICS.

Some wag has proposed as an infallible hypnotic the attempt to recall all the antiseptics which have been put upon the market. Before enumerating half of them one falls asleep, but that does not signify that the hypnotic is speedy in its action. If one were to attempt to satisfy himself as to just which of the list is most effective, especially if he followed the counsel of their makers, he might land in a retreat for the hopelessly perplexed.

Fortunately few antiseptics seem to be talked about much in connection with war wounds, but the discussion of these few has been exuberant and possibly too exultant. We have now reached the stage of reaction and of more cautious criticism, and some competent surgeons have dared question whether the results obtained by the newer and much talked of methods are better than by older and longer tried ones. We hope this opinion is not justified, for we want all the good we can get out of the war, including means of disinfection. If the profession is disappointed in such hopes it will not be the first time.

It is an open question, however, whether, in the management of war wounds, the physical condition and the psychological atmosphere in and about the patient may not have such a decided influence for recovery as would unconsciously bias the judgment of the surgeon as to the effect of his treatment. The soldier is usually supposed to be in better bodily condition than the average man who gets injured in times of peace, while there is considerably more mental satisfaction over being wounded in defence of his country, than while toiling in a shop over the making of some commonplace material for trade. Then the nurses and other attendants are likewise filled with a more than ordinary fund of enthusiasm for their work. Certainly the conditions are not the same as in humdrum hospital life in times of peace, and the fight of the patient against bacteria may be a much braver one. Such being the case, the comparative value of the much talked of methods of wound care will not be known until they are tried out in times of peace. Even the excitement of war has not availed to maintain at its first fever heat the enthusiasm with which the methods of Sir Almroth Wright and Dr. Alexis Carrel was first received.

THE USE OF CRIMINALS IN WAR.

A recent issue of *The Star-Bulletin* published by the inmates of Sing Sing prison devotes much of its space to the advocacy of applying the draft to convicts, and the arguments set forth are worthy of consideration.

The object in the punishment of the criminal by the State is twofold: first, to discourage crime in others, and, second, to reform evil propensities in the criminal. Unfortunately, our penal system has so far lamentably failed as a means of reform for the criminal. The world will not believe a man repents and will generally not give him an opportunity to do so. It is rarely, indeed, that a man who has once been sent to prison for a serious offense is ever rehabilitated in the estimation of the public, no matter how upright may be his life nor how genuine may be his reform. War affords an opportunity for the prisoner to expiate his crime by offering his life for his country, and while the first impulse is to reject such a suggestion, there does seem to be much to be said in favor of its adoption under certain conditions.

Most criminals become malefactors through their revolt against the discipline imposed by society. This attitude of revolt against discipline would unfit many of them for the particularly severe discipline of military life. There are some classes of criminals the nature of whose crimes would exclude them from consideration in any plan for the utilization of criminals in war. Among these would be included the unnatural crimes, and those arising from hasty temper. There would still remain a large number of criminals whose services could be used under proper conditions of supervision and restraint for the good of the State.

An enormous amount of manual and skilled labor is required behind the lines. Much of this labor is performed under conditions which would permit the segregation and supervision of the laborers. In such work criminals could be employed with marked advantage to themselves and economy to the State. It does not seem to us that the draft should be applied here, but that opportunity should be afforded to criminals of certain classes to volunteer for service in the army, with the understanding that they would still be treated as criminals, would be segregated and would be kept under close observation. Even under these conditions service in what the British army terms the "Army Service Corps" would be preferred by many to a continuation of service in prison, and men who did volunteer and who proved trustworthy would at the expiration of their prison term be transferred to regular service with the added advantage of experience gained in the pris-

oners' war service. We do not think that the American public would sanction the use of prisoners on the firing line even as volunteers, nor indeed are we inclined to propose it, but the objections are rather sentimental than practical.

There is a great lack of man power in the land. The cost of maintaining prisoners in prison has been considerably increased by the higher cost of food. These men could be maintained with less cost as workers in an army service corps than in prison and could more than earn the cost of their maintenance. Therefore from an economic point of view such a utilization of criminals would be most advantageous to the State. The prisoner himself would be much helped by assignment to duty for his country, as such service would go far toward rehabilitating him as a citizen both in his own eyes and in those of the community. The prisoner who could show a good conduct card for active service for his country in time of war would have a very much better chance of regaining a foothold in civil life after his term of prison service had expired.

The suggestion which emanates from the criminals themselves that the criminal man power of the country should be made use of is worthy of the most serious consideration of criminologists, psychiatrists, and the military authorities. We are confident that some plan can be worked out which will enable us to draw on this tremendous reservoir of man power.

WAR EMERGENCY FORMULAS.

Great Britain and other of the European nations now our allies have long been compelled to practise every possible economy for the furtherance of the war, and the outlook for our having to follow suit, in many directions at least, is such that it is well to note some of the possibilities for economy and the ways to meet them. In the *Lancet* for November 17, 1917 there appears a note on an addendum to the British Pharmaceutical Codex which contains several formulas designed to save glycerin or sugar. While the preparations for which the formulas are suggested may not be quite the same as those of our Pharmacopeia, the formulas themselves are worthy of publication.

The first two are for the purpose of avoiding the use of sugar, where that has been employed as a sweetening vehicle or to increase the viscosity of the menstruum. A satisfactory artificial syrup or "syrupus factitious" can be made by dissolving 0.7 gram of powdered tragacanth and 0.5 gram of chloroform in distilled water to make 100 mls. The chloroform provides the sweetness to some extent and the tragacanth makes the mixture sufficiently viscid to be a fair imitation of syrup. A second formula consists of ninety parts of glucose and ten parts of distilled water.

For formulas which contained glycerin the first

of the preceding will often serve quite satisfactorily and may even be better, as in the case of a vehicle for phenol. A five per cent. solution of phenol in syrupus facitius is more readily absorbed than the glycerite of phenol and probably will be found to be more powerfully antiseptic. Glycerite of tannic acid can well be replaced by a mixture of ten grams of tannic acid, 1.2 gram of tragacanth, 0.5 gram of chloroform, and two mls of alcohol in enough distilled water to make 100 mls.

Since we are now in the throes of a sugar shortage it might be well for some of our pharmacists to experiment with these suggestions with a view to adapting them, or others like them, to the preparations of our Pharmacopœia and National Formulary, and since it is altogether probable that we shall need to conserve our output of glycerin the other suggestions might as well be worked up at the same time. In fact these few formulas are merely suggestive of the lines along which we should work in the furtherance of an economy which is much needed in this country where we have heretofore been unduly lavish with many materials and where we have often sought the easiest rather than the most economical way of doing things in general.

CONTAGIOUS DISEASES IN THE NAVY.

In no other relation is the subject of contagious diseases of greater importance than in the navy. The modern battleship is a mass of complicated machinery and to make proper use of this machinery the ship must carry a very large number of men crowded together in very close contact. Such a vessel as the *Pennsylvania*, the flagship of the Atlantic fleet, will carry about 1,700 men, who are in such close contact with each other that it is almost impossible to prevent the spread of a contagious disease once it has been introduced in the ship. It is surprising, therefore, to see how few deaths from contagious diseases are reported on such vessels. This favorable result is only brought about by the most careful attention to sanitary precautions. At this season of the year tonsillitis is prevalent. It was found long ago that the men who slept on the deck, rather than in their hammocks, were the first affected. Consequently, stringent orders are enforced against sleeping on deck and care is exercised that the decks shall be frequently disinfected by the application of suitable disinfectants such as cresol. It is by the exercise of wise forethought in such sanitary details as this that our navy has established and maintains such an enviable health record.

TELESCOPES FOR THE NAVY.

The Honorable Franklin D. Roosevelt, assistant secretary of the navy, has requested the Editors of the *NEW YORK MEDICAL JOURNAL* to place before its readers an appeal for the loan of binoculars, spyglasses, and telescopes. A former similar appeal to the public produced about 3,000 glasses, but many thousand more are needed. The Navy Department will key all glasses retained and make a permanent record of the fact that they have been

lent. Every effort will be made to return them to their owners at the close of the war, but it is impossible to guarantee them against damage or loss. Since the Government cannot accept material or services without remuneration, the sum of one dollar will be paid to each person from whom glasses are borrowed, which sum will constitute the rentals in case the glasses are returned or payment in case they are destroyed or lost. Any physician who owns a pair of binoculars, a spyglass, or a telescope can render a material service to his country by lending it to the navy. Glasses should be forwarded either by mail or express to the Honorable Franklin D. Roosevelt, assistant secretary of the navy, care of the Naval Observatory, Washington, D. C., and each glass should be carefully tagged with the name and address of the owner. Any glasses received which are not suitable for naval use will be returned to the sender.

News Items.

A Base Hospital on Staten Island.—The United States Government has leased, with an option to purchase, about one hundred acres of land near Fort Wadsworth, Staten Island, as a site for a military base hospital, which will have accommodations for about three thousand beds. Contracts calling for the erection of the hospital and administration buildings have been awarded.

Health Certificate Required of Candidates for Marriage.—Dr. Hermann M. Biggs, health commissioner of the State of New York, has issued a circular to town and city clerks notifying them of the importance of conforming to the law which requires that all applicants for marriage licenses must make oath that they have not been infected with any venereal disease, or that if infected within five years laboratory tests show them to be now free from infection.

Higher Rank for Medical Officers.—In urging the passage of the Owen bill providing for higher rank for medical officers, Dr. Samuel W. Lambert, dean of the College of Physicians and Surgeons, Columbia University, points out the importance of giving higher rank to medical officers in our Army as is done in the British Army. The French and the British armies suffered from this trouble at the beginning of the war, but the conditions in both armies had been improved by giving higher rank to medical officers.

Smallpox in New York.—Dr. Hermann M. Biggs, commissioner of health of the State of New York, reports that smallpox is unusually prevalent in New York at the present time. Since January 1, 1918, there have been reported to the State Department of Health 375 cases of smallpox and reports of the disease are being received daily. In one of the large cities where recently over 100 cases have occurred, the Chamber of Commerce has inaugurated an active campaign in cooperation with the local department of health in behalf of general vaccination. While many of the cases reported are of a mild type, some are very severe.

Venereal Clinics of the Health Department.—The Department of Health of the City of New York wishes to impress upon the public and the physicians of the city that the so called "venereal clinics" of the department are not intended for the treatment of disease. The medical adviser studies the history of each case, examines the patient, takes blood specimens for serum tests and smears for microscopic examination, and impresses upon the patient the necessity for adequate skilled medical attention. If the patient is unable to pay for this treatment, he is referred to the already established public dispensaries. If he is able to pay for treatment, he is urged to engage the services of a competent physician. Under no circumstances is the patient treated by the medical adviser of the Board of Health.

A Clinic for Drug Addicts in Newark, N. J.—The citizens' committee appointed recently to inquire into the subject of habit forming drugs in Newark, N. J., and to make recommendations by which the evil may be eliminated or reduced to a minimum has sent its report to the mayor. The report recommends that a clinic be established in the City Dispensary for the study and treatment of narcotic addicts, so that immediate relief may be afforded to indigent addicts and that "a comprehensive study be made to guide the committee in its future deliberations." So far as the committee knows, no such clinic is in existence anywhere. The committee consists of Dr. Charles A. Rosewater, Dr. H. J. F. Walhauser, and the Rev. Dr. Dorr F. Diefendorff.

The Extension of Psychological Examinations.—Surgeon General Gorgas's recommendation for the extension of psychological examination to all enlisted men and all newly appointed officers and his plans for carrying out these examinations have been approved by the Chief of Staff. Special buildings and equipment to cost \$10,000 to \$12,000 for each camp have been authorized for the work, and four commissioned officers and twenty enlisted men for each division will be required. A school of military psychology will be established at the medical officers' training camp at Fort Oglethorpe, where about fifty psychologists will be entered each month for a minimum of two months' training. The extension of these psychological examinations is based upon the results obtained in four divisional camps where the method was tried.

The Rockefeller Foundation Budget.—The first budget of the \$10,000,000 fund to be spent in 1918 by the Rockefeller Foundation has been announced. The largest appropriation is \$150,000 to be used in welfare work in the military camps, under the supervision of the Commission on Training Camp Activities, appointed by the Secretary of War. The National Committee for Mental Hygiene receives an appropriation of \$37,000 "for surveys of public care of mental diseases and studies in psychopathology of crime." An appropriation of \$6,500 is given to the State Charities Aid Association "for public clinics in New York State in aftercare of infantile paralysis cases." The China Medical Board receives \$11,430 to be used within five years in the maintenance of the two hospitals on the Island of Kunglung. Provision has been made for bringing Chinese students to the United States for medical instruction.

Expanding Army Medical Training Camps.—The ultimate needs of the Medical Department of the Army will require training camps of capacities totaling 35,000 to 40,000 officers and men. Enlargement of the camp at Fort Oglethorpe, Ga., to a capacity of 7,000 has been authorized, its present capacity being 5,500. Fort Riley has a capacity of 7,000. The medical training camps at Fort Benjamin Harrison, Ind., and Fort Des Moines, Iowa, for colored men and officers, were closed on December 1st. About 9,000 officers and 20,000 enlisted men have been graduated from these four camps since June 1st. The course of instruction is being expanded by the introduction of special lectures on the following subjects: Orthopedic surgery, x rays, psychology, sanitation, hospital administration, veterinary science, laboratory work, and dentistry. The advisability of establishing courses in general military surgery, genitourinary surgery, and military surgery of the brain, head, and face is under consideration.

Colonel Goodwin Becomes Director General of the British Army Medical Service.—Colonel T. H. Goodwin, C. M. G., D. S. O., who has been in the United States for several months acting as liaison officer at the office of the Surgeon General, has been appointed acting director general of the British Army Medical Service, to succeed Sir Alfred Keogh. Colonel Goodwin has given a series of lectures at the Army Medical School, Washington. He has delivered addresses before medical audiences in all the larger cities of the Middle and Eastern States, and recently published a book based upon these lectures under the title *Notes of an Army Medical Officer*, constituting No. 2 of the Army Medical Manuals issued with the approval of the Surgeon General. Before coming to the United States Colonel Goodwin had served in the British Army in India and had served for two years with the British Army on the western front, receiving wounds which caused him to be detached temporarily from active service and assigned to special duties with the Surgeon General's Office in Washington.

Meetings of Medical Societies to Be Held in Philadelphia During the Coming Week.—Monday, February 4th, Academy of Surgery, Blockley Medical Society, Clinical Association; Tuesday, February 5th, Laryngological Society, Medical Examiners' Association, Wills Hospital Ophthalmic Society; Wednesday, February 6th, College of Physicians; Thursday, February 7th, Obstetrical Society; Friday, February 8th, Atlantic County Medical Society, Northern Medical Association.

New Officers of the Philadelphia County Medical Society.—At the annual business meeting of the society, held on Wednesday, January 16th, the following officers were elected: President, Dr. Frank C. Hammond; vice-president, Dr. John W. West; associate vice-presidents, North Branch, Dr. M. D. Bloomfield; South Branch, Dr. Edwin C. Cooke; Kensington Branch, Dr. J. Edward Wallis; West Branch, Dr. John W. Groskey; Northeast Branch, Dr. Albert C. Buckley; Southeast Branch, Dr. Charles Mazer; Northwest Branch, Dr. Robert J. Downs; secretary, Dr. William S. Wray; assistant secretary, Dr. Elmer H. Funk; treasurer, Dr. Edward A. Shumway; directors, Dr. William E. Parke, Dr. George A. Knowles, Dr. F. Hurst Maier; censor, Dr. William M. Welch.

The Health of the Troops in Camp.—Slight increases in the sick rate for both National Guard and National Army, for the week ending January 25th, over figures for the preceding period, are shown by the health report published on January 26th by the War Department. The non-effective rate for the National Guard was 50.4 per thousand, as compared to 49.1 the preceding week, but the hospital admission rate decreased from 30.1 to 29.3. The non-effective of the National Army was 53.9, as compared to 51, and the hospital admission rate was 39.6, as compared to 36.6. There were eighty-one deaths in National Guard camps, as compared with sixty-six the preceding week. Of that number forty-seven were pneumonia cases. Deaths in the National Army were 108, against 149; pneumonia caused seventy-one of the deaths.

Personal.—Colonel James R. Church, Medical Corps, U. S. Army, who was promoted subject to examination, has been found physically disqualified for the duties of colonel, by reason of disability incident to the service and was retired from active service with the rank of colonel, to date from January 12, 1918. Colonel Church entered the Army as an assistant surgeon in 1898, and is the holder of a Medal of Honor, awarded by Congress for most distinguished gallantry in action at Las Guasimas, Cuba, June 24, 1898.

Major William A. Duncan, Medical Corps, U. S. Army, was retired from active service to date from January 4, 1918, for disability incident to the service.

Dr. Lawrence J. Henderson, professor of biological chemistry in Harvard University, is giving a series of public lectures on food conservation at Smith College.

Dr. Charles Norris, head of the pathological department of the Bellevue Hospital, has been appointed chief medical examiner, succeeding Dr. Patrick D. Riordan, whose temporary term expired January 31st.

Meetings of Medical Societies to Be Held in New York During the Coming Week.—Monday, February 4th, Clinical Society of New York Throat, Nose, and Lung Hospital, German Medical Society of the City of New York, Brooklyn Hospital Club, Clinical Society of the New York Polyclinic Medical School and Hospital, West Side Physicians' Economic League; Tuesday, February 5th, New York Academy of Medicine (Section in Dermatology), New York Neurological Society, Society of Alumni of Lebanon Hospital, New York; Wednesday, February 6th, New York Urological Society, Brooklyn Society for Neurology, Society of Alumni of Bellevue Hospital, Harlem Medical Association, Bronx Medical Association, Society of Alumni of St. John's Hospital, Brooklyn, Long Island Society of Anesthetists; Thursday, February 7th, New York Academy of Medicine (stated meetings), Brooklyn Surgical Society, Physicians' Economic Society of New York; Friday, February 8th, New York Academy of Medicine (Section in Otolaryngology), Society of Externs of the German Hospital in Brooklyn, Flatbush Medical Society, Brooklyn, Eastern Medical Society of the City of New York, Clinical Society of the German Hospital and Dispensary, Manhattan Dermatological Society; Saturday, February 9th, New York Association of the Medical Reserve Corps of the United States Army.

Modern Treatment and Preventive Medicine

A Compendium of Therapeutics and Prophylaxis, Original and Adapted

TREATMENT OF SLEEPLESSNESS.

By LOUIS T. DE M. SAJOUS, B. S., M. D.,
Philadelphia.

The causes of sleeplessness are multitudinous, but from the standpoint of the immediate pathogenesis bearing directly upon conditions clinically existing in relation to the nervous tissues, nearly all these causes can with advantage be grouped under two general heads, viz., the congestive, in which the intracranial circulation remains so active that oxidation and nutrition in the nervous tissues concerned cannot sink to a level compatible with sleep, and the excitative, in which a persistent stimulus from the periphery, or some other exciting agency, forces a continuance of central nervous activity. In the excitative group may be included sleeplessness due to worry and like mental states, the activities relating to the subject in consciousness maintaining activity also, through nervous pathways or otherwise, in other parts of the brain. The well known toxic form of insomnia, it would seem, is not entitled to special recognition on a par with the two fundamental groups mentioned, but constitutes a portion of each of these groups, some instances arising through the direct action of toxic material on nerve tissue, while others undoubtedly occur through a dilator toxic action on the vessel walls, a state of hyperemia resulting which prevents sleep.

The manner in which sleep is normally brought on and the physiological changes accompanying it are in many respects enlightening in relation to the pathogenesis of insomnia. Conditions favoring sleep comprise, in particular, a diminution of the nerve impulses received by the central nervous system from the special sense organs and remote tissues. Any cause resulting in a persistence or increase in centripetal impulses, in a broad sense, the excitative group, tends, therefore, to induce sleeplessness. A second condition favoring sleep is fatigue, which reduces central nervous response to stimuli. Absence of fatigue, occasionally an accompaniment of sleeplessness, can thus likewise be a contributing factor in the etiology of the latter. Again, turning our attention to various theories put forth to explain the actual mode of production of sleep, we note one of the theories best substantiated by physiological facts and experimentation to be the anemia theory, championed in this country by Howell. Observations of the experimentally exposed brain, e. g., have shown that the blood flow to the cortex diminishes during sleep. Plethysmographic records from the arms of sleeping subjects demonstrate that during and after the period of onset of sleep the vessels of the limb dilate, a fact interpreted as indicating that in this period the blood flow through the brain diminishes, the blood distribution having become so altered that a larger amount than before passes into the cutaneous and other peripheral tissues. The close relationship between blood distribution and sleep is suggested in that the plethysmographic record shows

a temporary diminution in the volume of the arm whenever the experimental subject is disturbed, even if but slightly. Such sensory stimuli are deemed by Howell to cause peripheral vascular contraction by exciting the vasomotor centre in the medulla. Again, the blood pressure has been shown to fall during sleep, and it is even considered probable that the blood flow through the brain in waking hours is normally governed indirectly by the state of the circulation in other portions of the body.

That the circulatory changes may merely be an accompaniment, and not the causal factor, of sleep is not disproved by the facts just presented, but there are additional facts, such as the sleepiness which follows a heavy meal from accumulation of blood in the digestive organs, and that resulting upon prolonged assumption of the standing posture, from fatigue of the vasomotor system and gradual sagging of the blood toward the lower portions of the body, which do suggest a causal relationship, and such features have led Howell to emphasize anemia, or better, oligemia, of the central nervous system as a major factor in sleep production. As a result of the increasing fatigue of the vasomotor centre, due to its activity in maintaining an adequate flow of blood in the brain throughout the day, the centre is at last only with difficulty kept active, and when the usual preparations for sleep have been made seclusion in a dark room, closure of the eyes, etc., the complete cessation of the stimuli which previously kept the centre active results in a rapid drop in its functional activity, this in turn leading to the changes in blood distribution already referred to. The objection which has been raised to the anemic theory, that the processes of repair and replenishment of the central nervous tissues during sleep are incompatible with a decreased blood supply, seems invalid when one considers analogous states in the case of muscular or glandular tissues. After the increase in local blood supply attending motor or secretory activity has taken place, the reduction in blood supply following cessation of such activity, it is plain does not preclude repair or replenishment in the tissues concerned. As a third factor in sleep production, in addition to anemia and cessation of centripetal excitation, Howell recognizes the fatigue of the brain cells themselves after a day's activity. Whether the factors mentioned by Howell alone account for sleep, or whether, as seems not improbable, additional factors referred to in the so called chemical theories of sleep, may also be operative, much evidence is manifestly at hand of an important relationship of intracranial blood supply to sleep induction, and a firm basis seems afforded for the recognition of a type of insomnia due mainly to congestion of the central nervous tissues.

The treatment in congestive insomnia, in addition to the removal of the cause of the congestion—or, it may be, merely an inability of the brain vessels to contract, without an actual hyperemia at any time—consists in applying "derivative" measures. A more

direct procedure would be to excite contraction of the brain vessels themselves; but this is difficult to secure except with more or less habit forming drugs, in particular those of the coal tar analgesic group, which have been experimentally shown to cause a prolonged intracranial vasoconstriction. Preferable, therefore, is the use of nonpharmaceutic measures calculated to withdraw blood from the brain to other parts, in particular the digestive organs, with their extensive vascular distributions, and the skin. Even the mere ingestion of hot water will exert an appreciable derivative action by directly relaxing the gastric vessels and exciting motility, but the taking of some light food, such as hot milk or malted milk, is likely to be more efficient, the digestive processes being set in motion. A point to be borne in mind is that an entire meal would increase the pulse rate and raise the blood pressure, defeating the end in view; the amount of food ingested must, therefore, not be such as to excite the digestive processes too strongly.

Derivation of blood toward the skin is carried out, in a partial manner, in the ordinary hot foot bath, but more effectually in a general warm bath at bed time, subsequent stimulating friction of the skin being avoided. To this some add a cool foot bath with brisk rubbing of the feet, the resulting sensory stimulation not being deemed sufficient to interfere with the effect of the derivative action. Where such measures fail, Hinsdale, 1911, recommends a cold wet pack with friction of the entire body. While, in this procedure, the initial result is cutaneous vasoconstriction, hyperemia is the secondary, conclusive result, with corresponding depletion of the brain. A cool spinal douche has also been recommended.

(To be continued.)

An "Omnibus" Treatment of Gastric Disorders.

—Léon Meunier (*Presse médicale*, November 15, 1917) lays stress on postprandial pain or discomfort as an almost universal manifestation in gastric disorders of various kinds, and reports cryoscopic studies of the stomach contents upon which he bases a new system of treatment for the relief of the symptom mentioned. After a meal of bread the freezing point starts relatively low— $d = 0.70$ —and rises progressively during digestion until, after an hour and a half, d approaches 0.35. After a meal of meat, on the other hand, the freezing point starts high— $d = 0.15$ —and descends during digestion until, after an hour and a half, d approaches 0.35, which, however, is in neither case precisely attained. The freezing point $d = 0.35$ corresponds, according to Meunier, to the ideal, physiological evacuation of the stomach. In disease conditions he found the freezing point, at the time of greatest postprandial discomfort, one to two hours after meals, always abnormally low. Thus, in cancer of the fundus, $d = 0.67$; in pyloric stenosis, 0.72; in gastroparesis, 0.59, and in Reichmann's disease, 0.49. In the treatment of the pain or the discomfort the object is thus to favor evacuation by restoring the freezing point to -0.35° . This is done by administering one of a number of solutions themselves having this freezing point, viz., sodium bicarbonate, 0.9 per cent.; dried sodium citrate, two per cent.; dried

sodium sulphate, one per cent.; sodium phosphate, 1.1 per cent.; sodium chloride, 0.55 per cent.; pepsin, four per cent.; official hydrochloric acid, 0.935 per cent.; or official phosphoric acid, 2.68 per cent. A wineglassful of one of these solutions is to be taken every ten minutes, beginning when the pain appears. The choice of the solution, or solutions, is made according to whatever additional therapeutic action is applicable in the individual case, i. e., according to whether an acidifying, excitomotor, neutralizing, or other effect is desired. In a few cases, e. g., in those with hypersecretion, the relief of pain by this method is not as rapid as that from large doses of alkalies. The latter, however, by exciting acid production, probably aggravate the existing condition, while the author's solutions, acting particularly on the function of evacuation, are held to allay the discomfort without augmenting the disease.

Anthrax.—D. G. Dudley (*Journal A. M. A.*, January 5, 1918) states that when treated properly few patients will die of anthrax infection and that there are three available successful methods of treatment. They are based on the fact that the bacillus does not form spores in the blood. As soon as the diagnosis is made treatment should be undertaken, the best plan being immediate, complete excision of the affected area. The skin should be scrubbed gently with soap, rinsed with sterile water, painted with an aqueous solution of phenol of eight per cent. or stronger, and rinsed with alcohol. The lesion should then be painted with collodion and eight per cent. phenol solution should be injected into the tissues at a little distance from the lesion so as to completely wall the entire lesion off from the remaining tissues. A quarter of an inch outside of this phenol zone the tissues should be injected with twenty-five per cent. alcohol. The line of intended incision is then painted with the phenol solution and an area 2.5 to 3.5 inches in diameter is excised. The excision is at once followed by painting of the base and edges of the wound with pure phenol followed by its irrigation with absolute alcohol. A wet dressing is then applied. When this excision fails to remove the entire infected area edema will make its appearance in forty-eight hours and under such circumstances, as well as in those cases where for anatomical reasons excision cannot be undertaken, the following treatment should be undertaken. Three or four syringefuls of eight per cent. phenol should be injected into the edematous zone, incisions made and drains inserted, and an ice bag applied. The third method of treatment is the use of antianthrax serum as supplied by the Bureau of Animal Industry, and should be combined with the second in all cases. The first dose should be thirty-five mils and ought to be injected intravenously. It may be repeated if necessary, and a second dose ought always to be given either intravenously or intramuscularly after sixteen hours. Where the infection is in the region of the larynx one should always be in readiness to perform tracheotomy on account of the extensive and rapidly developing edema associated with the disease. In addition to the methods of direct attack outlined one should administer stimulants and salines.

Treatment of Pyelitis.—Robert K. Rewalt (*Pennsylvania Medical Journal*, December, 1917) lays stress on the prophylactic treatment. Care should be taken in children to keep the fecal matter away from the vagina and rectum. Dietetic treatment is of paramount importance. In the bottle fed, gavage may have to be employed. Large quantities of water are absolutely essential. If necessary, enteroclyses or hypodermoclyses should be given. Malt soup has been recommended on account of its alkaline reaction. Urotropin has been the drug most generally used in this condition, one to five grains, depending upon the age of the child, four or five times daily, well diluted with water. Salol is useful. The alkaline treatment is not quite so efficient—sodium bicarbonate, ten to thirty grains with potassium citrate, five to ten grains, every two or three hours until the urine becomes alkaline. The alkaline treatment may be alternated with the urotropin treatment, giving each form of treatment for a week at a time.

Serum Treatment and Prophylaxis in Acute Sore Throat with Hoffmann Bacilli.—P. Nobécourt (*Bulletins et mémoires de la Société médicale des hôpitaux de Paris*, October 25, 1917) lays stress on the fact that by the use of glucose agar in Veillon's culture tubes, differentiation of the true diphtheria bacillus from the Hoffmann pseudodiphtheria bacilli, as shown by Martin and Loiseau, is a possibility from the practical standpoint. Comparing for a period of fifteen months the clinical manifestations in a large number of soldiers with actual or suspected diphtheritic sore throat, Nobécourt found that where lone bacilli were obtained the throat usually presented the clinical features characteristic of diphtheria; where the bacilli were of intermediate length, such features were less often present, while in the case of short bacilli, they were exceptional. On admission, before bacteriological examination, antitoxin injections were given whenever the clinical condition was such as to suggest diphtheria. Under these circumstances it was noted that antitoxin had been administered in eighty-five per cent. of the long bacillus cases, fifty per cent. of the intermediate, and eight per cent. of the short bacillus cases. All the patients recovered except one with long bacilli and early bulbar disturbance. From these observations the conclusion is reached that antitoxin is only exceptionally indicated in short bacillus cases, oftener in intermediate cases, and still more frequently in long bacillus cases. The Veillon culture method yielding unmistakable results only after four or five days, clinical features must continue to regulate the indications for antitoxin in the presence of established disease. From the standpoint of prophylaxis, however, careful differentiation between the several lengths of bacilli may be of distinct service. The short bacilli in convalescents and carriers disappeared at two successive examinations, as required by military regulations, only after seven to forty-four days. In view of the relative mildness of short bacillus affections, their low power of contagion, and their actual scarcity, only thirteen per cent. of the entire number, the period of segregation and idleness in such cases could, with the aid of the bacteriological test, be with little risk shortened.

Treatment of Persistent Contractures Following Tetanus.—Léon Bérard and Auguste Luvion (*Bulletin de l'Académie de médecine*, November 13, 1917) note that since preventive serum injections have been systematically enforced in wound cases, the most rebellious symptom of tetanus has proved to be a permanent contracture of the injured limb. Where fracture coexists, attempts at reduction result in complete failure, faulty union and deformity following. In the absence of fracture, the contracture, persisting several months, is accompanied by joint stiffness resulting in prolonged disability hitherto wholly refractory to active or passive mobilization and all other therapeutic measures. Pain is also a marked feature at first. Early removal of the contracture being obviously the best treatment, regional anesthesia through injections of a 1.5 per cent. solution of novocaine, with one drop of adrenalin solution per mil, was practised by the authors. In the case of the upper extremity, the injections were made about the brachial plexus, and in involvement of the lower limb, at the site of emergence of the sciatic nerve and in the vicinity of the nerves supplying the contracted groups of muscles. Although, as a rule, the opportunity was had only to apply the method several weeks after the onset of contracture, excellent results were obtained, as illustrated in five reported cases. Frequently the first injection was sufficient almost completely to overcome the condition, though generally several injections were given. The period of motor disability is greatly shortened by the treatment.

Repair of the Crucial Ligaments.—Ernest W. Hey Groves (*Lancet*, November 3, 1917) makes a wide horseshoe incision over the joint, with its ends running up to the ends of the hamstrings and its lowest point below the tubercle of the tibia. By a saw cut beneath the tubercle and one vertical to it at its lower end the ligamentum patellæ is freed and turned up. The iliotibial band must not be cut in this opening of the joint. The joint is then flexed and the crucial ligaments brought into view. For the repair of the posterior ligament, which should be done first if both are torn, the inner end of the incision is prolonged until the tendon of the semitendinosus is exposed. This is then cut from its lower attachment and canals are drilled from within the joint, beginning at the sites of attachment of the two ends of the posterior crucial ligament, which have previously been cleaned of the old ligament. The upper canal passes upward and backward through the internal condyle of the femur, the lower downward and outward through the external tuberosity of the tibia. The tendon is then threaded through these canals and sutured to the tibial periosteum. For restoration of the anterior crucial ligament the same plan is followed, but a band of the fascia lata is made to take the place of the tendon used for the posterior ligament. The joint is closed by nailing the tubercle of the tibia in place and suturing the incisions with catgut. The knee is then kept on a back splint for about two weeks and when the skin incision has then healed it is removed from the splint for gentle massage and passive movements each day. After a month the splint is dropped and the patient allowed to get about on crutches.

Treatment of Acute Otitis Media in Childhood.

—George B. Wood (*Pennsylvania Medical Journal*, December, 1917) advises both prophylactic and curative treatment. The nose and throat should be maintained in a healthy state. Obstructing lesions such as enlarged faucial and pharyngeal tonsils or serious intranasal deformities must be corrected. The nasal douche should not be employed. An oily solution containing about one grain of menthol and camphor to the ounce instilled into the nostrils will accomplish good results and is not productive of harm to the ear. A weak adrenalin solution, 1:20,000 may be combined with the oil. For the pain, the hot water bag or the hot salt bag is the best. The canal may be douched with hot water from 105° to 115° F. Warm carbolized glycerin, five to ten per cent., may be instilled into the canal. Oily solutions should not be used in the ear. After either spontaneous rupture of the drum or paracentesis strict asepsis must be observed. Gauze wicks, tipped with ten per cent. carbolized glycerin, are inserted into the canal and removed as frequently as they are soiled. If the discharge is thick the canal may be cautiously douched with warm boric acid solution. The chief indication for performing a mastoid operation is a tendency of the disease to progress following paracentesis.

Artificial Pneumothorax in Advanced Cases of Pulmonary Tuberculosis.

—Henry L. Shively (*American Medicine*, November, 1917) defines the cases most suitable for collapse therapy as those which have been thoroughly tried out and have failed to respond to other methods of treatment; those in which there is active and progressive disease or a cavity in the top of one lung with the other lung relatively sound; febrile cases in which the patient is losing weight. After a few injections the temperature may drop to normal, the cough and expectoration be reduced by one half, and the morale of the patient be completely changed. The site to be chosen for the introduction of the needle is to be determined by a careful physical examination of the patient's chest, by percussion and the stethoscope; also the fluoroscope and the x rays. The Floyd Robinson apparatus is employed with 0.5 per cent. novocaine anesthesia. In some cases one per cent. to two per cent. cocaine is used. A small incision is made in the skin before introducing the needle. Dyspnea, rapid heart action, or pain should cause the cessation of the flow of gas. Sterile nitrogen gas is usually preferred because it is less rapidly absorbed than the others. The author has employed this treatment in fifty cases, all of them in a far advanced stage of the disease. In twelve very good permanent results were obtained. In twelve other cases the results have been satisfactory though not so marked as in the first group. In six cases the disease has been progressive and little permanent effect from the treatment has been observed. Eight patients have died, two after a single injection. The twelve remaining cases are equally divided between those in which repeated efforts were unsuccessful in effecting an entrance into the pleural cavity and the patients who discontinued the treatment after one or two injections and before any significant effect could be expected.

Cholecystectomy Without Drainage.—A. Murat Willis (*Journal A. M. A.*, December 8, 1917) advocates the removal of the gallbladder without drainage in cases of simple infection of that viscus, and describes a simple technic whereby this can be done without soiling the peritoneum with the contents of the gallbladder. Through a curved right rectus incision the gallbladder is brought into view by upward rotation of the liver and an incision is made along the hepatoduodenal ligament to expose the cystic duct. This is then clamped, together with the artery, with a right angled clamp. A ligature of No. 2 catgut is placed about the cystic duct close to the common duct, another near to the clamp and the duct is cut between. The gallbladder is then removed by blunt dissection toward its fundus, the peritoneum being preserved to be sutured over the space which is left. A crown suture is taken through the peritoneum, under the stump of the cystic duct and back over the stump, and is tied so as to drop the stump back into the ligament. A continuous suture of the ligament then closes all raw surface.

Neurotization of Paralyzed Muscle.—John Joseph Nutt (*Journal A. M. A.*, December 22, 1917) conducted a series of experimental observations on dogs to determine the possibility of securing neurotization of paralyzed muscles by muscle grafting and was able to prove that successful results could be obtained. He then applied the method to a group of sixteen cases of poliomyelitic paralyses, making twenty muscle grafts. In seven there was complete failure; in six there was slight but insufficient return of power; in four the results were fair; and in three they were good. The operation consisted in splitting the bellies of the exposed paralyzed and normal muscles; sewing together of the deeper edges of the two with chromic gut; approximation by a few interrupted sutures of the central parts of the two muscles; and suture of the two upper edges followed by skin suture. The operation had the advantage of doing no harm, even when nothing was gained by its performance.

Carcinoma of the Cervix.—In their Report of Treatment of Carcinoma of Cervix at the Huntingdon Hospital for Period of Four Years, Edward H. Risley and George A. Leland (*Boston Medical and Surgical Journal*, December 27, 1917) bring out these points of interest and value in their analysis: Much symptomatic relief can be expected from radium treatment, especially in the checking of hemorrhage and alleviation of pain. Prophylactic radiation immediately following hysterectomy is a logical, safe, and advisable procedure and should reduce the number of recurrences. The treatment of early recurrences offers a fair prognosis. Late treatment offers little but alleviation of symptoms and but little retardation of growth. Inoperable cases are benefited by radium and the period of life is somewhat prolonged. Radium should be given more extended and earlier trial in these cases. It is believed that every patient operated on should be required to report for observation once a month for the first year and once in three months for the second year and at frequent intervals for each succeeding year; in this way only can early recurrences be detected.

Tartar Emetic in Malaria.—A. W. Falconer and A. G. Anderson (*Lancet*, November 17, 1917) tested Rogers's suggestion that tartar emetic, given intravenously, was effective in curing malaria. The drug was given in two per cent. solution to eight patients suffering from tertian malaria, two of whom had both benign and malignant forms, and one the malignant form only. In the two with mixed forms the crescents disappeared, but the benign parasites persisted. In the pure malignant case the crescents disappeared, but the patient had three subsequent clinical attacks of malaria. In none of the cases did the tartar emetic cure the benign form of infection or remove the parasites from the blood, and in no case of the whole series was there any marked clinical improvement brought about by the treatment.

Early Mobilization in the Treatment of Wounds.—Kouindjy (*Presse médicale*, November 8, 1917) reports the case of a soldier injured by barbed wire in whom a felon developed on the right ring finger; this, in turn, was complicated by phlegmonous inflammation. The arm having been immobilized for five months, the patient showed partial ankylosis of the shoulder, almost complete ankylosis of the injured finger, and stiffness of the wrist and other fingers. Contrasting with this case one of shell wound of the arm, with compound fracture of the humerus, in which, immobilization having been instituted for only twenty days and followed by systematic mobilization of all the joints of the extremity, the patient was soon back on the firing line. Kouindjy strongly urges early mobilization in all war traumatism, except in the presence of acute or suppurative arthritis.

Pneumonia in Early Life.—Henry T. Price (*Pennsylvania Medical Journal*, November, 1917) outlines the treatment under three heads: 1, hygienic and dietetic measures; 2, the treatment of the pathological condition; 3, the symptomatic treatment. Fresh, but not necessarily cold, air is of great value. The diet should be so arranged that it will carry the patient through with the least amount of work for the intestinal tract. If a nursing child is too weak to nurse the milk must be withdrawn from the breast and fed through a Breck feeder or dropper. If the intestinal tract shows signs of indigestion the milk should be diluted one third with plain water. To treat the pathological condition counterirritation and inhalations should be employed. Counterirritation may be used in the form of hot or cold applications, blisters, and cupping. The mustard plaster is probably the best form. It is indicated early in the disease or during the stage of congestion. Inhalations should be nonirritating and pleasant. Steam inhalations with creosote or benzoin are of greatest value when there is much bronchial irritation. If the child is very restless opium may have to be administered. Otherwise fresh air and a tepid bath are usually sufficient. An initial dose of castor oil should be administered to clear out the intestinal tract. If the stomach is not retentive, enteroclysis or even hypodermoclysis should be used. When vomiting is a serious symptom acidosis may be present, in which case the bicarbonate of sodium should be added to

the solution administered. Heart stimulants are necessary in some cases. If the pulse is rapid but regular, strophanthus should be given. If the pulse is irregular and soft, caffeine seems to be the most effective. The routine use of alcohol stimulation is contraindicated. To combat respiratory failure atropine should be given until the physiological effect is obtained. The use of oxygen inhalations is very beneficial especially if used in conjunction with atropine. The hot mustard bath should be given when the child is cyanotic and greatly depressed.

Quinine and Urea Injections in Hyperthyroidism.—Leigh F. Watson (*Illinois Medical Journal*, November, 1917) reports remarkable results from concentrated injections of quinine and urea into the thyroid gland, the symptoms being relieved in eighty-five per cent. of the cases. In eighty per cent. of the exophthalmic cases the goitre entirely disappeared in an average period of five months, and in only five per cent. was there no improvement. It is well to precede these injections by preliminary injections of saline followed by sterile water to raise the resistance to stimuli and so prevent acute hyperthyroidism. As soon as no reaction follows the water injections the quinine and urea is begun.

Asthma.—Richard H. Brown (*Illinois Medical Journal*, November, 1917) sums up his conclusions as follows: Asthmatic paroxysms are anaphylactic attacks of which the underlying cause is sensitization of the system by absorption of protein toxins from the bowels or retained secretins in the nose or elsewhere. The exciting cause is the inhalation or ingestion of this protein poison while the system is so sensitized. Nasal irregularities may tend to focus a toxic attack in the respiratory tract which might otherwise show in another manner. Finally, thorough treatment of nasal disease or abnormality with proper attention to bowel toxemia cures or prevents a large majority of cases.

Surgical Treatment of the Prostate.—E. S. Judd, (*Pennsylvania Medical Journal*, November, 1917) concludes as follows: The transvesical operation for the removal of enlargements of the prostate seems to be more accurate technically. With great care to avoid infection the operation can be done as safely, if not more safely, than the perineal. When possible, the preliminary treatment should be carried on by means of a urethral catheter, as it permits a better operation afterward. In some instances it may be necessary to do the operation in two stages. Spending a little more time with the patient under a general anesthetic will permit a less spectacular but a much more satisfactory operation and the results will be good.

The Common Cold.—Percival J. Eaton (*Pennsylvania Medical Journal*, December, 1917) asserts that children suffering from colds should be isolated and put to bed. To avoid the predisposing causes the child's body should be kept in the most vigorous condition. The bowels should be kept freely open. The diet should be plain, nutritious, wholesome, and appetizing. His skin should be kept in the pink of condition. Cold daily bath promotes bodily vigor. There should be a plentiful supply of fresh air both night and day.

Miscellany from Home and Foreign Journals

A Study of Diabetes of Fifteen or More Years'

Duration.—Albert H. Hornor and Elliott P. Joslin (*American Journal of the Medical Sciences*, January, 1918) traced 1,156 out of a total number of 1,187 cases of diabetes, some of these patients being alive, some dead. Among these were sixty-two who lived fifteen or more years, and of these thirty-seven are living and twenty-five are dead. The following points were noted: Obesity was demonstrated in sixty out of the sixty-two cases. A diabetic heredity is one and a half times as frequent among the cases of fifteen or more years' duration as among all diabetic patients. The average loss of weight when the patient first came for treatment was forty-one pounds. Gallstones were recognized in eight cases, being six times as frequent among these cases as in the entire series of 1,187 cases. The presence of acidosis was demonstrated twenty-one times, and eleven, or forty-four per cent., of the fatal cases succumbed to it. Arteriosclerosis occurred in thirty-six and was a prominent factor in causing the death of ten patients. Diabetes is now a minor issue in fifty per cent. of the living patients, and at the time of death was a minor issue in twenty-eight per cent. of those who died. An extremely rigid diet is necessary for only four of the patients now living. Of the fatal cases twenty per cent. outlived the normal expectation of life for their age at the onset of their diabetes, and this is already true for ten per cent. of the living cases. Dietetic treatment was carried out to a considerable degree by fifty-seven cases; of the remaining five, three are among the dead.

Hypothermia in Soldiers.—P. Merklen (*Bulletins et mémoires de la Société médicale des hôpitaux de Paris*, October 25, 1917) comments on the frequency with which a subnormal body temperature is met with in military practice. Most commonly the condition occurs as a sequel to the pyrexia of a severe infection, such as pneumonia, the temperature often ranging about 36°C ., or even sinking to 35°C ., for a few days. In some other patients a distinct morning and evening hypothermia is noted in the absence of a febrile condition, the accompanying symptoms being, e. g., fatigue, headache, diffuse pains, general asthenia, anorexia, and malaise. The well known periods of hypothermia in typhoid cases apparently do not occur any oftener under war conditions than in civil practice. Low temperature in soldiers may be largely ascribed to profound fatigue, the result of an accumulation of successive exertions the impress of which on the system persists for a long time. The symptom is encountered not only in men just issuing from the trenches but also in those who have already enjoyed a certain period of rest. The latter not having yet sufficed for the restoration of organic equilibrium, if some disease condition supervenes, the subject will show the same temperature reactions as one just relieved of active duty. Hypothermia may, in fact, be noted in men who have never yet entered the trenches; life in the barracks seems at times sufficient to induce the condition. In many instances hypothermia

constitutes the sole evidence of existing fatigue; apparently, the heat regulating centres exhibit a special degree of susceptibility, fatigue being manifested solely in an inability to work up the usual febrile reactions upon due provocation. In some subjects a slow pulse rate coexists and the systolic and diastolic blood pressures are slightly lowered. In some cases the white line of adrenal insufficiency was noted in hypothermia, with or without asthenia or low blood pressure. Where a subnormal temperature accompanies diarrhea or other manifestations of abdominal disorder, the latter may be either the probable or certain cause of the former, according to circumstances.

Biological Classification of Pneumococcic Infections.—C. C. Hartman and G. R. Lacy (*Journal, A. M. A.*, December 29, 1917) determined the biological classification of the bacilli isolated from the sputum of a series of 112 patients seen in Pittsburgh. The incidence of the four different types of infection and the mortality for each was found to be essentially the same as previously determined by Cole in New York. Cultures were also made from the blood and other fluids in a number of cases and the type of organism isolated compared with that of the sputum. The incidence of blood infection was also determined roughly. Nine of ten blood cultures from patients with Group I infection were positive; two out of six in Group II; the only one taken from Group III was positive; while the three taken in Group IV were all negative. In every case in which cultures were taken from two or more sources the organism was always the same from all sources. Finally, it was shown that the mortality was much greater among those patients of all groups in whom positive blood cultures were obtained than in those who did not yield positive cultures.

Exhaustion Pseudoparesis.—J. Ramsay Hunt (*Journal A. M. A.*, January 5, 1918) made thorough, routine neurological examinations of some 1,500 men in an officers' training camp and discovered four cases which clinically resembled very closely cases of early paresis. The chief somatic symptoms were pupillary, muscular tremors, and disturbances of articulation. The pupils were unequal and reacted sluggishly or not at all to light; the tongue and facial muscles showed muscular tremors; and articulation was tremulous and imperfect. Cerebral and mental symptoms were not marked, although there were some which were suggestive of an exhaustion neurosis. Syphilis was excluded in all the cases and all recovered after proper rest. The condition seemed to be due to a state of overfatigue brought on by the hard work and close application to study indulged in by these men taken suddenly from more or less sedentary occupations. The condition had not been encountered in civil life, but careful search should reveal its occasional occurrence under conditions producing extreme mental and physical fatigue. None of the patients was aware that anything was wrong with him at the time.

Coagulation Time of Blood Specimens from Tuberculous Patients.—Newell Ely Burns and Albert E. Young (*American Journal of the Medical Sciences*, December, 1917) found the average clotting time of 132 specimens of blood taken from 120 patients, eight of whom were probably non-tuberculous, to be seven minutes and forty-five seconds. No striking demonstration of results was obtained when these cases were grouped according to coagulation time, occurrence or nonoccurrence of hemoptysis, and stage of disease activity or quiescence. A substudy was made of twenty-four cases. Twelve patients with recent hemoptysis showed coagulation time increased in several instances and averaging eight minutes and thirty seconds. Twelve patients without hemoptysis and with disease processes parallel to those of the patients in the first group showed coagulation time increased in as many instances as among those of the first group and the same average, eight minutes thirty seconds. No attempt was made to show the results of medication with calcium salts.

Banti's Disease.—Charles Norris, Douglas Symmers, and Louis Shapiro (*American Journal of the Medical Sciences*, December, 1917) maintain that the so called Banti's disease is neither an independent clinical nor anatomical entity, and that the designation should be eliminated from the nomenclature of splenic pathology. This conclusion is based on the following: 1. The later stages of acquired syphilis are occasionally attended by enlargement of the spleen arising independently of cirrhotic changes in the liver, and, when combined with the secondary anemia constantly observed in the syphilitic, it fulfills the essential requirements of the first, or preascitic stage of Banti's disease. 2. In other cases of late acquired syphilis splenomegaly and cirrhosis of the liver are combined, in which event jaundice, subcutaneous and submucous varices, ascites, digestive disturbances dependent upon chronic passive congestion of the gastrointestinal mucous membrane, hematemesis, and related changes constitute an exact clinical counterpart of the picture given by Banti for the intermediary and final stages of the disease described by him. 3. The syphilitic cirrhosis of the liver just referred to is of two varieties, one corresponding to the atrophic or hobnail liver of Laennec, in which syphilis is an etiological factor in at least one third of all cases; the other, the coarsely lobulated liver, in which syphilis is universally recognized as the specific cause. 4. In 4,880 autopsies cirrhosis of the liver occurred seventy-four times in 314 luetic subjects, or in 23.4 per cent., and of this number there was an associated splenomegaly of marked proportions in forty-eight, or 64.8 per cent. Of the seventy-four cases, fifty were of the coarsely lobulated type and twenty-four of the atrophic or hobnail variety. The histological changes in the spleen in the condition described by Banti are identical with those due to syphilis. The lesion is a chronic diffuse interstitial splenitis attended, in certain instances, by sclerosis of the Malpighian follicles, which is characteristic only of recessive status lymphaticus, where it occurs with almost unvarying regularity, and in the spleen of the so called Banti's disease is but a coincident histological change.

Production of Cataract.—W. E. Burge (*Archives of Ophthalmology*, January, 1918) says that in looking for the cause of cataract it would seem that at least two factors should be considered, one a modification of the protein of the lens by ultraviolet radiation, and the other certain inorganic salts by which the modified protein can be precipitated. According to this hypothesis the prevalence of cataract among people living in the tropics could be accounted for by the increase in the radiant energy factor modifying the lens protein so that an excess of salts, such as silicates in case of people in India, would combine with the protein to precipitate it and produce an opacity of the lens or cataract. The prevalence of cataract among glassblowers is also accounted for by the excess of the radiant energy factor, the assumption being that glassblowers who acquire cataract have a more or less disturbed condition of nutrition expressing itself in an increase in sugar in case of diabetes, calcium salts, or some other substance, which can combine with the lens protein made sensitive by the action of the short wave lengths. The prevalence of cataract among diabetics is accounted for by the increase, not in the radiant energy factor, but in the chemical factor.

Operative Risk in Cardiac Disease.—John M. Blackford, Fred A. Willius, and S. B. Haines (*Journal A. M. A.*, December 15, 1917) direct attention to the fact that general impressions alone are to be found in the literature regarding the relation of cardiac disease to surgical operations. They have, therefore, investigated the problem in an extensive series of cases and have reached the following conclusions: Valvular disease with good or fair compensation does not materially increase the operative risks and is not a contraindication to operation, or the proper use of ether anesthesia. The cardiac risk is best estimated in surgical cases by a careful interpretation of the patient's ability to stand stress. In ambulatory cases with no marked loss of compensation operation is generally safe. Where decompensation is marked it should be remedied by medical treatment prior to operation. There should be no surgical intervention in a cardiopath, however, unless it is apparent that it is essential to reasonable health or will benefit the cardiac condition. Marked or complete relief of very severe cardiac disease often results from the surgical removal of infective, mechanical, or toxic sources of strain or degeneration, specially is this the case in toxic goitre. Auricular fibrillation increases the operative risk by only three per cent. There seems to be no increased risk and there is often very marked improvement from operation in certain cases of auricular flutter, partial or complete heart block, or intraventricular block. Myocardial insufficiency may reach a point at which improvement from treatment is no longer possible. The only way to determine this stage is by the therapeutic test, and until it is reached surgical treatment should not be denied the patient as it frequently improves the cardiac condition greatly. The development of definite to marked cardiac improvement in selected cardiac cases occurred in eighty per cent. of the cases studied following surgical treatment, and this, alone, justifies the small increased operative risk under such circumstances.

Proceedings of National and Local Societies

THE AMERICAN CONGRESS OF INTERNAL MEDICINE.

Annual Meeting, Held December 27 and 28, 1917, at Pittsburgh, Pa.

The President, Dr. R. W. WILCOX, in the Chair.

(Concluded from page 191.)

Röntgen Findings in Abdominal Pathology.—

Dr. WILLIAM A. EVANS, of Detroit, presented some of the problems of the röntgenologist and at the same time indicated how the internists could help advance the specialty and thus advance medicine generally. Many röntgenologists had become so enthusiastic over their method of examination that they had forgotten the ordinary clinical methods and had even gone so far as to hold them in disdain. There was certainly no basis for such selfglorification. On the other hand perusal of the literature would show the slight esteem in which many clinicians held the work of the röntgenologist which proved primarily that the writers had not had the advantage of association with and the cooperation of competent röntgenologists and neither had they followed Röntgen literature and it was to be hoped that the time would soon come when a better understanding between the clinician and the röntgenologist would be universal.

Before taking up the individual headings under the subject of this paper, it should be understood that the Röntgen study was properly carried out in the first place only by both the fluoroscopic and the röntgenographic methods. Both had their indications and merits, but one could not be used to the exclusion of the other. In the study of the diaphragm the fluoroscopic method was the most useful and the erect position was preferable for such study. The first thing to be noted were the contour and relative height of the diaphragm lines and then the contour of each detail of the diaphragm. When the diaphragm on either side showed waves or undulations, one could strongly suspect either abdominal or chest pathology. The plate method was of particular value in determining subphrenic abscess. Carcinoma of the pancreas was diagnosed by the disturbance in outline and relations of the duodenum produced by the presence of a new growth. The study of the pancreas was rendered difficult by its structure as well as by its relations. Well developed cysts of the head of the pancreas could be recognized during a Röntgen examination by the fact that there was a displacement and change in the relations of the pylorus and duodenum. The indications for röntgenological hepatic study were limited. Nevertheless an enlarged liver could be demonstrated and it had been possible to demonstrate tumor, notably in one instance a tumor in the upper right quadrant diagnosed as cyst of the liver and verified by operation. Advances in the study of the gallbladder had been remarkable. From the demonstration of a single gallstone the position had been reached where many röntgenologists reported the demonstration of at least fifty per cent. of gallbladder deposits. It

might, however, be stated that attention should always be called to the fact that negative evidence of gallstones simply indicated that no stones were present which had a lime content of two and a half per cent. or more. The demonstration of the gallbladder itself was probably more important than the demonstration of gallstones. The conditions demonstrated included hydrops, empyema, and chronic thickening of the gallbladder. Inasmuch as the normal gallbladder was seldom demonstrated it could be safely assumed that the shadow of the gallbladder definitely indicated pathology.

In regard to the spleen, the differential diagnosis of tumors of the left upper quadrant could be aided by the demonstration of the splenic outline. In order to show this organ, it was necessary to distend the stomach with gas and also to have considerable liquid in the stomach. With the patient on the right side, with the above conditions complied with, the splenic outline was frequently well shown. Coming to the peritoneum and mesentery, the Röntgen method of examination was frequently useful in the differential diagnosis of extravisceral new growths. The usual findings were those of a displacement of the stomach or small intestine or colon; differential diagnosis had even been made of a low abdominal mass as a dermoid cyst.

In the urinary tract the question of the Röntgen diagnosis of calculi was settled beyond any shadow of doubt, but new growths and disease other than calculus could be well studied provided the proper technic was carried out. For instance, in the rare exception that the plate did not show the kidney outline, one could usually suggest the presence of a perinephric abscess. In connection with bladder symptoms, by making posteroanterior plates as well as anteroposterior, it was possible to demonstrate the shadow of the prostate, both that of a chronic prostatitis and a prostate modified by a new growth. In cases of suspected calculus when the examination for stone was negative, it was the duty of the röntgenologist to make a detailed study of the lower spine for it had been frequently demonstrated that bone lesions of the lumbar and lumbosacral regions frequently manifested themselves in kidney function, micturition, and lumbar and inguinal pain. The findings in gastric ulcer could be classified under two general headings of direct and indirect. The most common direct findings were the bismuth fleck representing the ulcer crater, the filling defect in the gastric outline, and organic deformities other than defects such as hourglass contraction. The indirect findings were spastic manifestation, abnormalities in peristaltic waves, disturbed motility, unusual filling of the duodenum and pressure pain points. The speaker concluded with the hope that internists would become familiar with the possibilities of röntgenology and that they would learn correctly to associate the findings with the pathology and symptoms. Furthermore, there should be no good reason for postponing the röntgenological examination until all other tests had been carried out or diagnosis postponed for further observation.

Problems of Cardiovascular Disease.—Dr. EDWARD E. CORNWALL, of Brooklyn, called attention to the fact that the central pumping system, the heart and the arteries, was frequently subjected to wear and tear. If one considered this system as a whole it was not necessary to speak of arteriosclerosis, or chronic nephritis, or myocardial disease; these were merely manifestations and could not be considered as separate clinical entities. The damage which the vascular system frequently sustained as a whole presented many problems, but the discussion on this occasion might be confined to two phases, heredity and prophylaxis. Prophylaxis in cardiovascular disease deserved more attention than it generally received at the hands of the profession. It was a well known fact that cardiovascular disease was as important in the latter half of life as bacterial disease was in the early half, and there was no doubt that the loss was greater by the premature shortening of useful activities through such diseases. In the etiology heredity played a prominent part, the quality of the vascular apparatus being inherited in the same way that a constitutional susceptibility to tuberculosis might be said to be hereditary. An inherited metabolic insufficiency was frequently the pathological cause predisposing to cardiovascular disease, such factors in the family history as apoplexy, diabetes, arthritis, heart disease, chronic headaches, and obesity often being noted in patients whose vascular apparatus showed early signs of stress and strain. The consequences of such heredity could often be lessened by the mode of life. Either physical or mental overwork was one determining factor in producing early degeneration of the cardiovascular system. The nervous strain of modern life with late hours and excitement was apt to cause chronic arterial overpressure. There was an immense amount of work to be done by the metabolism in transforming material from outside the body into suitable elements for its nutrition and also in the arrangement for the elimination of waste products. Infectious diseases were a severe burden on the system and their toxins often permanently damaged the circulatory apparatus. Chronic poisoning was often caused by alcohol, caffeine, and tobacco.

In treatment, two factors were prominent, an easy life and an easy diet. The first was selfexplanatory, but the latter was not dismissed so easily. The diet must be adapted to the habit of life and must reduce the work of the organism to a minimum. Quantitative was as important as qualitative regulation. The food should be chosen with a scientific attention to detail as justified the serious condition of the patient. The ideal proteins were animal flesh, eggs, and milk, in terms of aminoacids. The symptoms of arteriosclerosis should be considered as nature's efforts to counterbalance existing damage. Sometimes Nature overdid her efforts at compensation; only where pressure was high, however, to injure the system was treatment by artificial dilators indicated. All other efforts should be directed toward removing the conditions which made treatment necessary and the most important constituent of this treatment was suitable protein diet.

Infection in the Production of So Called Pernicious Anemia.—Dr. FRANK SMITHIES, of Chicago, in considering the nature of pernicious anemia, believed that any progressive and chronic form should be considered pernicious. Before treatment could be suggested it was necessary that the nature of this disease should be understood, after which treatment could be directed toward the restoration of normal function. Since the first studies of this condition had been undertaken in 1822, the nature of this disease had been obscure; it progressed in a more or less selfregulated fashion toward a fatal conclusion. Addison's conception of the disease and Wirmers progressive anemia both represented processes in the blood picture attributable to unknown causes. Secondary anemia was supposed to be due to known causes, but it was impossible to draw a hard and fast line between the two, for one was apt to merge into the other. Addison's anemia was essentially a hemolytic anemia, specific, chronic in course, and closely related to sepsis; it was doubtless due to hemolytic organisms with selective action for the lymphoid tissue. Hunter believed that *Streptococcus longus*, *Streptococcus viridans*, or other organisms might undergo changes in virulence and be responsible for the condition.

In the chronic type, or Addison's anemia, there might be gastric anemia, spinal changes, disturbances of sensation, and psychic manifestations; pyorrhea was often an accompaniment. The acute type was characterized by delirium, extreme blood changes, hemoglobin very low and coagulation time prolonged, the blood being watery and greasy, variation of iodine and cholesterol content and increase of fatty acids which were toxic. There was considerable fatty degeneration of the nonstriated muscles. Accompanying these cases lesions were frequently found in the mouth, nasopharynx, teeth, and alveolar processes and an advanced glossitis with invasion of the lymph spaces of the tongue by hemolytic streptococci. Those gastrointestinal lesions that occurred were of the ulcerative type; there was early hypertrophy, followed by atrophy and bacteria invasion of the muscle bundles of the walls of the intestine. Culturing bacteria from the tissues would often reveal hemolytic streptococci, colon bacilli, or *Streptococcus viridans*. In the liver there would be great increase of blood derived pigments. The bone marrow showed megaloblastic hyperplasia which was followed by aplasia. In the chronic type the spleen was enlarged and congested and there was considerable perisplenitis. In the spleen tissues there were frequently to be found hemolytic cocci.

Removal of the spleen was not a cure for the disease. The principal points of treatment were to bring the serum back to normal, to stimulate antibodies to counteract the absorption of toxins, to stimulate red cell production in the bone marrow, to improve the patient's general state and prevent absorption of putrefactive products of digestion, and to insure protection of red cells by removal of hemolytic cells. The first point was best accomplished by introduction of whole blood through transfusion. The diet should be limited in respect to proteins and fats. Renal activity should be stimulated by water

and the heart favorably affected by rest in bed. Fresh air and sunlight were indicated as much as possible. In fifty-one exploratory laparotomies the focus of infection had been removed, from the spleen, liver, gallbladder or the appendix, after which the patients improved out of all proportion to the blood picture, fifty-six per cent. having been restored to normal. Favorable prognosis was in proportion to the amount of damage done to the system.

THE AMERICAN LARYNGOLOGICAL ASSOCIATION.

Thirty-ninth Annual Meeting, Held at Atlantic City, N. J., May 28, 29, 30, 1917.

The President, Dr. JOSEPH L. GODDALE, in the Chair.

(Continued from page 141.)

Bilateral Abductor Paralysis of the Vocal Cords.—Dr. RALPH BUTLER, of Philadelphia, reported the case of a child, eleven years old, who had congenital syphilitic cerebrospinal meningitis, causing ptosis of the right eyelid and internal strabismus. The biceps, triceps, and knee jerks were absent. The pupils were irresponsive to light and accommodation. The laryngeal symptoms, dyspnea and stridor, began when he was six years old, but disappeared after three doses of salvarsan, to recur three years later. The second case was a man sixty-two years old with a neoplasm in the upper part of the chest and neck, including the thyroid gland, and causing almost complete occlusion of the trachea. He had been under observation for five months, and improved under mercurial inunctions. The third case was a fatal one following the removal of the thyroid gland. The cases illustrated the greater danger from a sudden paralysis. The first two patients had been able to go about for many months with relatively little discomfort from obstructions which were little, if any, less than that which was fatal to the third, in which the paralysis was very rapid. Bert believed the greater mortality from sudden obstruction was due to reflex paralysis of the respiratory centres through irritation of the laryngeal nerves, and Krieger maintained that it was due to irritation of the cardiac branches of the vagus.

Dr. WALTER F. CHAPPELL, of New York, called attention to the case of a patient, a man forty-five years old. His present illness began one month before admission, when he became hoarse. This continued and was followed by dyspnea, at first on exertion, later continuous. His only complaints were hoarseness and dyspnea. When he entered the hospital a tracheotomy was done at once, as the vocal cords were immobile and almost in contact. The Wassermann and x ray of chest were both negative. Salvarsan was given twice and had no effect. Two weeks after admission, under suspension, the left vocal cord was removed with scalpel and punch. Three weeks later, as there was not space enough between the cords, the left recurrent laryngeal nerve was cut at the entrance into the larynx. In ten days the tracheotomy tube could be removed. When seen two months after the last operation, he was at work

and breathing easily. Cutting the nerve not only allowed the vocal cord to recede into the cadaveric position, but caused an atrophy of that side of the larynx which gave still further space. The man was to report if he had any difficulty, and had not as yet, so it was assumed he was well. Several physical examinations and nerve reflexes were negative.

Dr. GREENFIELD SLUDER, of St. Louis, added the record of a case seen in consultation. A physician, twenty-eight years of age, who developed acute laryngitis, apparently grippe, and with it a very violent dyspnea which, upon inspection, showed bilateral posticus paralysis. The cords were almost in the median line. The glottis was represented by a slit through which you could have dropped an old time silver five cent piece. Recovery required about six weeks, during which he became excited about something and almost smothered to death. Nine or ten months later another infection developed, laryngitis ensued, and again posticus paralysis. Doctor Sluder saw the patient in consultation through the three attacks.

Dr. BRYSON DELAVAN, of New York, saw a case of dyspnea, and found a marked abductor paralysis. He was obliged to do an immediate tracheotomy. The obstruction, however, was not entirely due to the laryngeal box. At a certain distance below the larynx, in the trachea, he also found constriction, and endeavored to overcome it by insertion of a long tracheotomy tube. The child died of exhaustion, and was found to have a large tuberculous lymph node pressing upon the trachea, which was evidently the cause.

Dr. W. B. CHAMBERLAIN, of Cleveland, referred to cases in the early stage of locomotor ataxia. His attention was attracted to this a number of years ago by a patient who was found unconscious in the street and taken to the police station on the suspicion of being drunk. On examination complete abductor paralysis and other signs of locomotor ataxia were found. He then went over to the City Hospital and made a routine examination of all tabetics there, and was surprised at the number of cases in which there was no history of this condition, but in which paralysis was found. Some few days ago an Italian, about thirty-five years old, came with a history of dyspnea and difficult respiration especially on exertion. Examination showed bilateral abductor paralysis. Doctor Chamberlain wished to refer the man to the hospital, but he disappeared. About four weeks later the consultant told the speaker that he found the man in an acute attack of dyspnea from which he succumbed in a short time.

Clinical Observations on the Lingual Tonsil.

—Dr. GREENFIELD SLUDER, of St. Louis, said that the diagnosis of lingual tonsillitis was simple in acute follicular cases. If it did not assume the follicular markings, it was often overlooked, particularly when the mass was not enlarged. It was recognized under these conditions by its color alone. An occasional, small, slightly reddened follicle was often the origin of the symptoms. The prognosis for singers and speakers, according to the writer's experience, should be guarded. A lingual tonsil

which easily became a disturbing factor, from singing, speaking, or infection, must be considered most seriously. He did not believe that the singing or speaking voice could be developed to any great extent under these conditions. The treatment of lingual tonsillitis in the acute follicular stage was like that for the faucial tonsils under like conditions. For the subacute or chronic state, with or without enlargement, nothing had been so satisfactory as applications of a small amount of silver nitrate saturated in fifty per cent. glycerin. Salicylic acid saturated in ninety-five per cent. alcohol was helpful, and did not taste so unpleasant. These might be made daily or as seldom as ten days. For the enlargement, galvanocautery destruction had seemed best. Hemorrhage following surgery of the lingual tonsil was more difficult to manage than any in the upper air passages. The association of lingual tonsillitis with thyroid gland disturbance and with glossodynia, he believed had not hitherto been recorded. It was his interpretation of clinical laryngology that the lingual tonsil played a major rôle.

Dr. ALBERT G. GETCHELL, of Worcester, Mass., said that the disease undoubtedly had certain lesions that we probably did not appreciate. He called attention to three points which he believed important: its relation 1, to the nervous system; 2, to hemorrhage; and 3, to cough. Trouble in this region would cause cough, but he believed that continued cough should not be attributed to such a lesion without a most thorough examination of the lungs. Simple examination of the sputum, without any examination of the lungs whatever, would often show the real cause of the trouble.

Dr. HENRY L. SWAIN, of New Haven, said that the relation of the circulation of the lingual tonsil to the veins of the base of the neck was peculiar. The veins from the surface of the tongue joined certain large vessels deep down in front and underneath the lingual tonsil. A sudden feeling of fullness was thus quite explicable. Emotional stress, like an irritable plexus, was sometimes evidenced by this feeling of a lump in the throat. It was perfectly possible to have a lingual tonsil cough and a bronchitis coexisting, both of which should be treated.

Dr. J. PAYSON CLARK, of Boston, stated that in his experience the enlargement of the lingual tonsil in children was a very rare condition and that he observed it most frequently in middle aged women.

Dr. ROBERT C. MYLES, of New York, said that an interesting point was whether the removal of the tonsils in early life did not result in their becoming hypertrophied in an attempt by the lingual tonsil to supply the physiological function of the tonsil. For many years he had removed lingual tonsils in a little different way from that originally indicated. He tried to devise some method of obviating hemorrhages and cicatricial tissue. One was to take out every other lymphatic tonsil with a guillotine and leave the alternate ones; that relieved the scar tissue. He also left islands of tissue. In using the guillotine one should not press too deeply. If one went beneath the tonsil hemorrhage would be more likely to result than if one put the proper

pressure on the guillotine, which made it possible to remove as much as desirable.

Dr. JOHN E. MACKENTY, of New York, believed that any infection in the throat might have secondary expression in the thyroid. In the case of a man with a foreign body in the esophagus, Doctor Mackenty failed to get the foreign body with bronchoscopy, but found the spot where the body had rested. The man was very ill, with a high temperature and pulse, and had a tender enlarged thyroid gland. He was positive there was pus in the neck but he found none. He then opened the thyroid gland, and in the centre found a large abscess which was secondary to the condition in the esophagus.

Doctor SLUDER, closing the discussion, said that he felt a substantial addition to the paper had been given by Doctor Swain's explanation of the globus hystericus. He, Doctor Sluder, did not know the network arrangement of the veins beneath the lingual tonsil, and it is not recorded in any of the anatomies I know of. Doctor Clark spoke of the enlargement of the lingual tonsil in children being rare. According to observation, the enlargement of the lingual tonsil in children was a very frequent manifestation. That the chest must be investigated in cases of cough seemed selfevident.

(To be continued.)

Letters to the Editors.

LARYNGEAL STENOSIS A COMPLICATION OF MEASLES.

1113 MADISON AVENUE, NEW YORK.
January 14, 1918.

To the Editors:

In the issue of the NEW YORK MEDICAL JOURNAL of December 15, 1917, I found a very interesting article by Dr. Ford Morris on Laryngeal Stenosis as a complication of measles. It is the first communication on this subject in a medical journal that I have seen. In the course of the article he says: "Some of the most widely read medical textbooks fail to mention this complication of measles."

In the article on Catarrhal Laryngitis which I had the honor of contributing to the American textbook on the diseases of children, edited by Starr, and published by Saunders, 1894, I treated the subject *in extenso* both as to etiology and pathology, especially the grave form of that ailment, catarrhal croup, laryngitis hypoglottica acuta gravis, which I had not found mentioned in any of the treatises on pediatrics available at the time, except in Henoch's *Vorlesungen über Kinderkrankheiten*. At the beginning of the chapter, in the general outline, I say, page 845: "The majority of the cases of this character observed by me, were due to premature exposure after an attack of measles, before the catarrhal laryngitis that usually accompanies that disease had subsided." This complication is, as far as my personal observation goes, a rather rare one. I had been in practice a number of years, had seen many cases of measles, but had never met with this complication until about the year 1890, when we had an epidemic, as it were, of measles in Cincinnati, during which many of the cases, in my own experience more than fifty per cent., manifested this complication in the earliest period of convalescence from the measles. It is possibly for this reason that most of the books make no mention of it, the authors thereof not having seen such cases.

In this article on catarrhal laryngitis, I give in detail a method of treatment of this complication that served me well, relieving the stenosis and its symptoms in a few hours, much better than either tracheotomy or intubation.

Very truly yours,

H. ILLOWAY.

A FIRM STAND JUSTIFIED.

117 WEST SEVENTY-SIXTH STREET,
NEW YORK, January 19, 1918.

To the Editors:

In a letter to the NEW YORK MEDICAL JOURNAL, published on November 24, 1917, I called attention to the official blanks issued by the New York State Department of Health, which contained a demand for the registration, in common with that of drug addicts, of patients suffering from incurable disease to whom morphine had to be administered. This I contended was an illegal interpretation of the law, which should be resisted at all hazards by the physicians as a breach of professional privilege. Later on, the appearance in this city of the attorney of the State Board of Health, Mr. Joseph A. Warren, as an advocate of an amendment to the drug laws creating a specially licensed class of physicians to prescribe for drug addicts, gave an opportunity of calling his attention through the public press to this illegal requirement of his Board, as a matter more worthy of his attention than the creation of a new specially privileged class of medical licensees by the State. According to a letter received from the State Board of Health by a physician of this city, these blanks are no longer issued by this department. In this letter the physician was advised to report his cases on his own letter heads, which of course contained no such requirement as the one objected to. Inasmuch as this abrogation of the State Board's requirement in this instance has not been publicly announced as far as I am aware, I think its promulgation is worthy of publication in your journal, to show what may be accomplished by a proper defense of the rights of physicians, even when advanced by individual members of the profession in the absence of concerted action by the organized medical bodies.

JOHN P. DAVIN, M. D.

REPORTING ACCIDENTS FROM LOCAL ANESTHETICS.

CHICAGO, January 15, 1918.

To the Editors:

The Committee on Therapeutic Research of the Council on Pharmacy and Chemistry of the American Medical Association has undertaken a study of the accidents following the clinical use of local anesthetics, especially those following ordinary therapeutic doses. It is hoped that this study may lead to a better understanding of the cause of such accidents, and consequently to methods of avoiding them or at least of treating them successfully when they occur.

It is becoming apparent that several of the local anesthetics, if not all of those in general use, are prone to cause death or symptoms of severe poisoning in a small percentage of those cases in which the dose used has been hitherto considered quite safe. The infrequent occurrence of these accidents and their production by relatively small doses point to a peculiar hypersensitiveness on the part of those in whom the accidents occur. The data necessary for a study of these accidents are at present wholly insufficient, especially since the symptoms described in most of the cases are quite different from those commonly observed in animals even after the administration of toxic, but not fatal, doses. Such accidents are seldom reported in detail in the medical literature, partly because physicians and dentists fear that they may be held to blame, partly, perhaps, because they have failed to appreciate the importance of the matter from the standpoint of the protection of the public.

It is evident that a broader view should prevail, and that physicians should be informed regarding the conditions under which such accidents occur in order that they may be avoided. It is also evident that the best protection against such unjust accusations and the best means of preventing such accidents consist in the publication of careful detailed records when they have occurred with the attending circumstances. These should be reported in the medical or dental journals when possible; but when, for any reason, this seems undesirable, a confidential report may be filed with Dr. R. A. Hatcher, 414 East Twenty-sixth street, New York, who has been appointed by the committee to collect this information. If desired, such reports will be considered strictly confidential so far as the name of the

patient and that of the medical attendant are concerned and such information will be used solely as a means of studying the problem of toxicity of this class of agents, unless permission is given to use the name.

All available facts, both public and private, should be included in these reports, but the following data are especially to be desired in those cases in which more detailed reports cannot be made: The age, sex, and general history of the patient should be given in as great detail as possible. The state of the nervous system appears to be of especial importance. The dose employed should be stated as accurately as possible; also the concentration of the solution employed, the site of the injection, whether intramuscular, perineural, or strictly subcutaneous, and whether applied to the mouth, nose, or other part of the body. The possibility of an injection having been made into a small vein during intramuscular injection or into the gums should be considered. In such cases the action begins almost at once, that is, within a few seconds. The previous condition of the heart and respiration should be reported if possible; and, of course, the effects of the drug on the heart and respiration, as well as the duration of the symptoms, should be recorded. If antidotes are employed, their nature and dose should be stated, together with the character and time of appearance of the effects induced by the antidotes. It is important to state whether antidotes were administered orally, or by subcutaneous, intramuscular, or intravenous injection, and the concentration in which such antidotes were used.

While such detailed information, together with any other available data, are desirable, it is not to be understood that the inability to supply such details should prevent the publication of reports of poisoning, however meager the data, so long as accuracy is observed. The committee urges on all anesthetists, surgeons, physicians, and dentists the making of such reports as a public duty; it asks that they read this appeal with especial attention of the character of observations desired.

TORALD SOLLMANN, Chairman.

R. A. HATCHER, Special Referee.

Therapeutic Research Committee of the Council on Pharmacy and Chemistry of the American Medical Association.

Book Reviews.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

Notes for Army Medical Officers. By Lieutenant-Colonel T. H. GOODWIN, R. A. M. C., Author of *Notes for Medical Officers on Field Service in India and Field Service Notes for R. A. M. C.* With an Introductory Note by Surgeon-General WILLIAM C. GORGAS, U. S. A. Illustrated. Medical War Manual No. 2. Authorized by the Secretary of War and under the Supervision of the Surgeon-General and the Council of National Defense. Philadelphia and New York: Lea & Febiger, 1917. Pp. 112. (Price, \$1.00.)

One of the most interesting figures which has appeared in the medical field during the war is that of Lieutenant Colonel T. H. Goodwin, C. M. G., D. S. O., of the Royal Army Medical Corps, who has been sent to the United States to represent the British medical service at the office of the Surgeon General. Colonel Goodwin has performed an invaluable service to the United States Army in acquainting its medical department with the actual conditions in field service in France. He is an officer in the regular army of Great Britain, has seen service in India and elsewhere and for three years on the Western front and is the author of two handbooks of instruction issued with the approval of the Royal Army Medical Corps. He has delivered a series of lectures at the Army Medical School in Washington, which were most informing in their character, and most attractive in their form. In the discussions which followed these lectures, Colonel Goodwin showed himself a master of every phase of the medical officer's work and displayed a phenomenal memory for

details and for statistics. The little book which constitutes Medical War Manual No. 2 is published under the authority of the Secretary of War, and the supervision of the Surgeon General and the Council of National Defense. It will be found of the greatest value to every medical officer both professionally and personally, for one of the most interesting parts of the booklet is the appendix giving advice regarding outfit, billeting, messing, social questions, censorship, and personal conduct. The little book, which only contains about 107 pages, treats of the organization and administration of the army medical service, war surgery, sanitation in war, and the brief appendix referred to above.

The Third Great Plague. A Discussion of Syphilis for Everyday People. By JOHN H. STOKES, A. B., M. D., Chief of the Section of Dermatology and Syphilology, The Mayo Clinic, Rochester, Minn.; Assistant Professor of Medicine, the Mayo Foundation Graduate School of the University of Minnesota. Philadelphia and London: W. B. Saunders Company, 1917. Pp. 204. (Price \$1.50.)

Doctor Stokes's book, *The Third Great Plague*, covers quite adequately the subject of syphilis for the use of "everyday people," and it should do a great deal of good. It is clear and simple in its statements of the facts; it is enlightened and progressive in its discussion of the social issues involved in prophylaxis and treatment. It recognizes that secrecy has had its day not only in diplomacy, but in other matters intimately affecting human wellbeing. It cannot have too wide a circulation.

Older folks are often shocked today at the freedom of younger ones in talking about matters of sex, and they deplore the looseness of conversation in the young. They do not realize at all that the question is not one of looseness of morals but of a change in the matter of taboos. The people of the last generation were to a large extent brought up under the old dispensation which held that sex was a sin, that in Adam's fall we sinned all, and so on, or, if they were not actually brought up in that belief, they were at least brought up in the social atmosphere that such a belief created. The world at that time was more traditional than ours, and its beliefs were more primitive. Among really primitive people where the more remote intellectual interests do not exist, the vitally immediate interests are those of constant practical concern, and so their religious ideas are intimately associated with food and sex. Among civilized people it has come to be recognized that food is matter for science and not for mysterious ceremonial, that the criteria are considerations of nutritive value and not those of offending a code or the totem animal. In the matter of sex, however, we still live in the shadow of conventions that grew up when people believed quite other things. Today it is sufficiently well known among modern young people that our particular institutions of property and marriage are a more or less imperfect product of the efforts of man to solve the difficulties presented by his natural desire to get what he wants and his equally strong desire to live satisfactorily in communities. It is known that the sex interest is a predominant one, that the little girl likes to mother her doll, that most little children are curious about birth and parentage, that the movie is a failure that is deficient in love interest, that there is in short a desire for love everywhere which the current order does not satisfactorily supply. Make believe and story are not sufficient and so things go grievously wrong, and many evils result. Among the secondary evils is the wide extension of syphilis. This is in reality no more shameful than tuberculosis, and is in large part the result of our failure to adjust conditions to our love life just as tuberculosis is the result in large part of our failure to adjust conditions of nutritive and domestic hygiene. Those who speak lightly of the ease with which one could abstain from irregular intercourse do not apparently recognize even so obvious and extraordinary a fact as this, that multitudes of well brought up young men go to the doubtful satisfactions of prostitution in deadly fear of infection—and nevertheless they go. It should therefore become a subject of effort among the intelligent people of our time to recognize the diseases especially associated with irregular intercourse as serious consequences of our social disorder, rather than as the evidences of some shameful wickedness on the part of the victim. Only with publicity can the innocent be protected and vital improvements inaugurated.

Births, Marriages, and Deaths.

Born.

BAUMGARTEN.—In St. Louis, Mo., on Tuesday, January 1st, to Dr. Walter Baumgarten and Mrs. Baumgarten, a son.

Married.

CONGDON-BURGOR.—In Schenectady, N. Y., on Wednesday, January 9th, Dr. Clark E. Congdon, of Fort Plain, N. Y., and Miss Hester Helena Burgor.

GIBSON-BORUM.—In Suffolk, Va., on Tuesday, January 8th, Dr. William Curtis Gibson and Miss Helen Catharine Borum.

HARKNESS-LANE.—In Montpelier, Vt., on Thursday, January 17th, Dr. Waldo Russell Harkness and Miss E. Hope Lane.

SONNELAND-JOHNSON.—In Sioux City, Ia., on Saturday, January 5th, Dr. Arthur M. Sonneland, of Norfolk, Neb., and Miss Josephine Johnson.

VOORHEES-WARD.—In Princeton, N. J., on Saturday, January 19th, Dr. Howard C. Voorhees, of New Brunswick, N. J., and Miss Florence M. Ward, of Newark, N. J.

Died.

BARBER.—In Newark, N. J., on Tuesday, January 15th, Dr. Pliny W. Barber, aged sixty-seven years.

BECKER.—In Springwater, N. Y., on Monday, January 14th, Dr. Allen R. Becker, aged fifty-nine years.

BLANCHARD.—In Jamestown, N. Y., on Friday, January 18th, Dr. Robert Newland Blanchard, aged sixty-two years.

BYRON.—In Indianapolis, Ind., on Monday, January 14th, Dr. Rachael A. Bryson, aged sixty-five years.

CATLIN.—In Grand Rapids, Mich., on Tuesday, January 15th, Dr. Herbert W. Catlin, aged fifty-six years.

CHANCEY.—In Pierce County, Ga., on Tuesday, January 8th, Dr. Marion G. Chancey, of Tampa, Fla., forty-one years.

CHAPIN.—In Canandaigua, N. Y., on Thursday, January 17th, Dr. John Bassett Chapin, aged eighty-nine years.

COOKE.—In Baltimore, Md., on Tuesday, January 15th, Dr. Theodore Cooke, Sr., aged eighty years.

FLEISCHNER.—In New Haven, Conn., on Sunday, January 20th, Dr. Henry Fleischner, aged seventy-three years.

GOLDMAN.—In Boston, Mass., on Monday, January 14th, Dr. Maxwell Goldman, aged twenty-six years.

JENNINGS.—In Brooklyn, N. Y., on Thursday, January 17th, Dr. William Ellery Jennings, aged forty-three years.

JEWETT.—In New York, N. Y., on Friday, January 18th, Dr. Charles Taylor Jewett, aged seventy-one years.

KIOUS.—In Columbus, Ohio, on Thursday, January 10th, Dr. Harry C. Kious, aged sixty-three years.

KOHN.—In New York, N. Y., Monday, January 21st, Dr. Albert Kohn, aged forty-eight years.

PHARR.—In Waco, Tex., on Thursday, January 10th, Dr. J. A. Pharr, aged sixty-eight years.

POWERS.—In Westport, Conn., on Friday, January 11th, Dr. Frederick Powers, aged seventy-five years.

PRINDLE.—In Chicopee, Mass., on Monday, January 21st, Dr. Charles H. Prindle, aged sixty-two years.

ROOT.—In East Burke, Vt., on Sunday, January 6th, Dr. Edward F. Root, aged fifty-six years.

SELHAUSEN.—In Brooklyn, N. Y., on Thursday, January 17th, Dr. Harry A. Sellhausen, of Washington, D. C., aged forty-three years.

SHEEHAN.—In Camp Cody, N. M., on Saturday, January 12th, Dr. Edward M. Sheehan, of Independence, Ia., aged thirty-five years.

STORY.—In Olympia, Wash., on Sunday, January 6th, Dr. Eugene Story, aged sixty-two years.

THOMPSON.—In New York, N. Y., on Tuesday, January 22d, Dr. Edmund B. Thompson, aged fifty-nine years.

VARNY.—In Newfields, N. H., on Wednesday, January 16th, Dr. Albert H. Varny, aged eighty-two years.

WHALEY.—In Charleston, S. C., on Monday, January 14th, Dr. T. Prioleau Whaley, aged forty-six years.

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WHOLE No. 2045.

Original Communications

VERTIGO.*

BY CHARLES GRAEF, M. D.,
New York,

Professor of Ophthalmology, Fordham University; Ophthalmologist
and Otologist, Lincoln and Fordham Hospitals, etc.

While it is true that vertigo is only a symptom, it very often presents itself so insistently that like, say catarrh or asthma, it bears an importance which makes us accord it more consideration and attention than it commonly bestowed on many fully acknowledged diseases.

Hughlings Jackson defines vertigo as a sensation of motor origin resulting from a discord between impressions from the labyrinth, the cerebellum, eye muscles, and other coordinating structures. Lack of harmony in brain impressions received from these structures gives the sensation known as vertigo. The name vertigo is derived from the Latin *vertere*, to turn, and it was formerly classified as: 1, aural vertigo, Menière's disease, characterized by sudden onset, dizziness, deafness, and tinnitus, at first believed to be due to hemorrhage into the labyrinth; 2, ocular vertigo, due to disorders of refraction or of the muscles, nerves, nerve centres, etc., of the eyes; 3, essential or idiopathic vertigo, the large group of cases in which no lesion could be determined. This classification no longer holds. We are now well assured that all cases of vertigo are aural in that the inner ear contains the organ chiefly concerned. The eye ranks high as a causative factor, and the large group of idiopathic cases is steadily lessening as our methods of diagnosis improve.

In these latter cases especially the physician was impelled to resort to more or less guesswork for an explanation, and a long list of terms such as gastric, hepatic, cardiac, nephritic, etc., was employed to define the vertigo according to the suspected source. We are still far from having attained a perfect plan for exact diagnosis of all our cases, but thanks largely to the work of Doctor Bárány, of Vienna, we are able to clear away much past misunderstanding and approach these cases with increasing confidence that definite analysis is within reach in many of them. This paper will present some of this work. Much of the material I got from Bárány himself while working in his clinic and laboratory in Vienna. Some I have gathered from my own work and the contributions of others on the subject.

It is now well recognized that the body equilib-

rium is governed by the vestibular apparatus of the internal ear through which the muscles of the skeleton receive impulses enabling them to keep the body balance. Any sudden disturbance of this mechanism in the semicircular canals of one side, or in the nerves linking these with other parts of the brain, will upset the balance and cause vertigo. Changes of a progressive type in the labyrinth may, if gradual, proceed to great lengths without causing vertigo at any time. Sudden exacerbations in such a progressive condition will do so, however.

To understand this one must remember certain anatomical and physiological facts about the eighth nerve, its distribution, and functions. It has two distinct functions. One part of it equips us for hearing sounds—its auditory function—and has its terminal distribution in the cochlea. The other part is distributed to the vestibule and semicircular canals; this concerns itself with the body equilibrium. Deafness and tinnitus follow damage or irritation of the first section of the nerve while vertigo is produced when the vestibular part of the nerve is affected. One may have deafness and tinnitus without vertigo, or dizziness without effect on the hearing, or all combined. The majority of cases of vertigo are due to faults in the vestibular mechanism itself or its associated parts and all cases of whatever origin are best studied first by careful tests of this part. These tests are not difficult and are based chiefly on the studies of Bárány, of Vienna.

The tiny semicircular canals are filled with a fluid called the endolymph which can be influenced by certain outside agents. If heat or cold differing in degree from the body temperature is brought in contact with the outer wall of the labyrinth, i. e., the inner wall of the ear drum, a current will start in the fluid of the canals just as it starts in the pipes of a hot water heating apparatus when the boiler is heated, or later allowed to cool. The warm fluid rises, the colder sinks to replace it. This is called the thermal or caloric test. Again the endolymph can be set in motion by turning the patient rapidly. The fluid moves with the body and if the body movement is suddenly stopped the fluid tends to keep on moving, resulting in a disturbance of the balance mechanism with vertigo more or less marked according to the sensitiveness of the individual, the duration and violence of the movement, etc. On this is based the turning test. The vestibular mechanism can also be disturbed by electric stimulation,

*Read before the Bronx Medical Society, November 7, 1917.

giving a galvanic current of small degree; this method is seldom used.

Sudden changes in atmospheric pressure may make themselves felt in the endolymph if the integrity of the labyrinthine wall is impaired at any point. Damage to this wall may result from injury or disease, as in severe or prolonged middle ear suppuration causing a fistula in the canal wall, or from undue relaxation of the foot plate of the stapes in the oval window. We test for this by alternately condensing and lessening the air pressure with a Siegle's speculum inserted in the ear canal. This is called the suction or fistula test. If any such fault is present in the wall, dizziness or nystagmus is produced by this instrument.

To grasp the effects of the tests on abnormal ears we must first clearly understand how they act on normal individuals. The three semicircular canals are placed in different planes in the head and it follows that some differences will be found depending on the position of the head in relation to the body when the tests are applied, e. g., if the head is erect, inclined forward, or held far back. Because of the connection of the vestibular nerve with the

in recalling the direction of the movements in normal persons if we remember that all occur in the direction the endolymph current takes. To paraphrase a famous old political proverb, as goes the endolymph, so goes the whole body. After turning a patient to the right, for instance, the endolymph moves in this direction, the patient tends to fall to the right, his eyes turn slowly toward the right and jerk back quickly to the left. We term this nystagmus to the left solely because the quick movement is easier to observe. The patient feels himself still moving to the right and therefore stationary objects about him seem to be moving to the left, i. e., objective vertigo opposite to the endolymph current. The same applies to the reactions for the caloric test. If, say, the right ear is tested, cold water starts an endolymph current toward the irrigated ear. The patient will have nystagmus with slow movement to the right and quick component to the left. He will fall toward the right, pastpoint toward the right, and have objective vertigo to the left. The exact opposite obtains when hot water is used to douche the ear.

Because nystagmus, unlike vertigo, is so easily studied quite independently of the personal equation of the patient, it has been selected as the best of the responses named for measuring and recording the effects of the labyrinthine tests. You are familiar with the nystagmus seen in such conditions as disseminated sclerosis and Friedreich's ataxia and have no doubt seen cases of the congenital nystagmus which occurs in children born blind, or with defective structure of the eyeball such as albinism, microphthalmos, or coloboma, and at times in color blind persons. In congenital blindness the nystagmus is a sort of feeling about or searching movement of the eyes and has been likened to the groping motions of the tentacles in the lower order of fishes. Another form is that acquired by occupation, as in the so called miner's nystagmus, probably due to poor light and work in an unusual position. Nystagmus occurring independently of some such condition is spoken of as spontaneous, to distinguish it from the nystagmus induced by the vestibular tests.

The exact nerve tracts through which the eye movements and vertigo are produced by these ear stimulations are not known but we are sufficiently sure of them to say that from the semicircular canals they pass through the eighth nerve to Deiter's group of nuclei in the anterior part of the floor of the fourth ventricle. Some fibres pass from here to the nuclei of the eye muscles and thence through the third, fourth, and sixth nerves to the ocular muscles. These are responsible for the nystagmus. Other fibres pass through the cerebellar crura to the cerebrum, the cortical centre being in the posterior part of the second temporal convolution. These fibres are responsible for the vertigo. The pathways from the horizontal semicircular canals differ somewhat from those of the fibres from the vertical canals. It is these nerve tracts with their nuclear and cortical connections and the parts of the internal ear from which they come that make up our static apparatus.

The important tests for us to apply in practice are three—the caloric, the turning and the suction

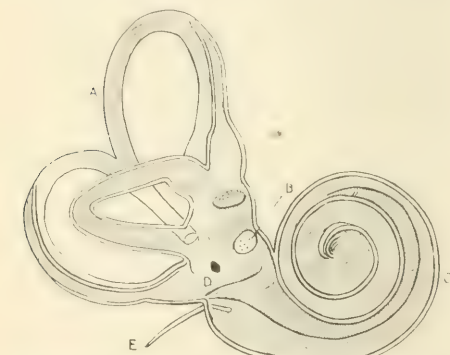


FIG. 1. Inner wall of the labyrinth, right side, showing the three semicircular canals and the coil of the cochlea. The canals and the cochlea are connected by the vestibule. A, semicircular canals, static part; B, lamina cribrosa for passage of the auditory nerve; C, cochlea, auditory part; D, vestibule, static; E, bristle in foramen rotundum. (From Gray's Anatomy.)

nerve centres controlling the ocular muscles we have associated with the dizziness a nystagmus or oscillation of the eyeballs, especially important because it can be easily observed as to duration and extent. There is likewise a tendency of the body to fall and an inability to direct the finger when an attempt is made to point at a given object, the result being a pointing with the finger several inches off to the side toward which the endolymph current has been started. This last is spoken of as pastpointing. The nystagmus consists of two movements of the eyeball, a slow movement in the direction of the endolymph current followed by a quick jerk back and is spoken of as right, left, vertical, rotary, etc., according to the direction of the quick movement. Nystagmus increases when the patient turns the eyes to the limit in this direction.

All these effects, vertigo, nystagmus, falling, and pastpointing, then are produced by irritation of the vestibular apparatus and little difficulty will be had

tests, and of these the turning test is first choice. The modern development of aviation offers a good example of the need for studying these organs, for an aviator requires normal function of the balance control mechanism. The United States Government has issued regulations for the examination of candidates. The turning test alone is required, and as these orders give us a good working basis for this test I will quote from them:

Rotation nystagmus is determined by placing the candidate in a revolving arm chair with an extemporized head and foot rest, with the head tilted backward and eyes closed. Revolve the patient toward his right ten times in exactly twenty seconds. The candidate is stopped suddenly, facing the examiner in a good light and told to open his eyes. The eyes will be seen to be oscillating; the quick component, which is the movement most easily seen, will be in the opposite direction to the turning, namely to the left. The number of seconds' duration will be noted. The test is then repeated, turning him to the left. Nystagmus will now be to the right. In each case it should last about twenty-six seconds. A variation of ten seconds either way is allowable.

Nystagmus: Head thirty degrees forward; turn candidate to the right, eyes closed, ten times in exactly twenty seconds. The instant the chair is stopped, click the stop watch; candidate opens his eyes and looks straight ahead at some distant point. There should occur a horizontal nystagmus to the left of twenty-six seconds' duration. The variation of eight seconds is allowable.

Pointing: 1. Candidate closes eyes sitting in chair facing examiner, touches the examiner's finger held in front of him, raises his arm to perpendicular position, lowers the arm, and attempts to find the examiner's finger. First the right arm; then the left arm. The normal is always able to find the finger. 2. The pointing test is again repeated after turning to the right, ten turns in ten seconds. During the last turn the stop pedal is released and as the chair comes into position, it becomes locked. The right arm is tested, then the left, then the right, then the left until he ceases to point. The normal will point to the right three times with each arm. 3. Repeat pointing test after turning to the left.

Falling: Candidate's head is inclined ninety degrees forward. Turn to the right five times in ten seconds. On stopping, candidate raises his head and should fall to the right. This tests the vertical semicircular canals. Turn to the left, head forward ninety degrees; on stopping, the candidate raises his head and should fall to the left. Unless each test is normal, it is a cause for rejection.

It would seem to me that an important additional test for aviation candidates would be the suction test, for differences of atmospheric pressure would surely affect a person whose labyrinth responded to this test. It seems likely that some of the accidents occurring to airmen in the high altitudes might be explained by a fault of this kind in the aviator's ears. The caloric test is even easier to apply, no special chair being needed. In making this test the patient's ear should be irrigated with a quart or more of water, best using a fountain syringe. First using cold water, it will be noted, if the vestibular apparatus is normal, that a nystagmus is started with dizziness felt by the patient. The quick jerking movements of the eyes are toward the opposite side, the slower toward the side being tested. When hot water is used the opposite effect is noted, the quick movement of the nystagmus is toward the irrigated ear. The suction test is simple and has been sufficiently dealt with.

For us the practical question is: How shall we approach the question of vertigo in our patients? Shall we be content to make the old guesswork solution of gastric, cardiac, hepatic, or essential

vertigo, or shall we not rather insist upon first making sure of the integrity of the static apparatus by one or more of the tests whose value is now well established? The symptom "cough" is always due to irritation of some branch of the pneumogastric nerve, though that irritation may be one or more of many possible kinds and parts. So likewise the irritation of the static apparatus resulting in vertigo may come from a great variety of sources. It is self-evident that a mechanism so sensitive to outside influences as thermal, turning, and other tests prove the static labyrinth to be, will also be affected by impressions from many parts inside the body.

Having determined by tests that there is no organic fault in the static labyrinth we give careful consideration to such evidence as may aid us in locating the origin of the irritation felt by the static apparatus. Thus the vertigo of anemia, plethora, neurasthenia, fever states, and digestive troubles is explained by chemical changes in the ear fluids themselves, difference of tonicity produced in the vestibular mechanism, or toxic effects on these parts. Similarly in the vertigo so often seen with paresis of one or more of the eye muscles with diplopia, it is not difficult to believe that the associated mechanism in the ear will feel the influence of the efforts the ocular muscles are making to correct the false projection and that the cerebrum will in turn respond with a sensation of dizziness, though there may here also be a short circuit from the ocular nuclei directly to the cerebral centres in the temporal convolution. The vertigo of ear sickness and the well known one associated with seasickness are probably due to impressions on the static labyrinth received both through the body motion and the attempt of the eyes to adjust themselves to the rapidly changing scenes. Closing the eyes and lying quietly back with the head fully extended is certainly the best cure for it and in this position the semicircular canals are least likely to cause nausea through body motion.

Indeed, it may be repeated, the eye with its faults of muscle balance, uncorrected or wrongly corrected refraction, etc., comes a close second to the ear itself as a source of troublesome vertigo. Careful study of the eyes should therefore always follow the ear tests in every case. That individuals differ very much in response to such stimuli is quite as much to be expected as differences in taste for flavors of food or drink, their sensitiveness to odors, estimation of heat and cold, etc. That the vertigo of seasickness is chiefly due to the effect of the motion on the endolymph is also suggested by the observation that once accustomed to the new motion and the education of the vestibular apparatus completed, the "sea legs" of the traveler acquired, a reeducation for the stationary becomes necessary on leaving the ship, a subjective feeling that the land is swaying remaining with the traveler for some hours after going ashore.

Of the muscles which move the eyeball the thinnest and narrowest is the superior rectus. It has also the poorest leverage, for it is inserted farther back on the eyeball than any of the others. Its only aid in lifting the eyeball is the small inferior oblique whose chief function is not elevation but

that of correcting the inward tilt given by the pull of the superior rectus in action, so that the effort of looking upward is by far the most exhausting of the eye movements. Muscular anomalies show themselves very often therefore in this direction, and it is to be expected that extra demands made on these weak structures will provoke symptoms of vertigo in many persons. This is found to be true in practice. Plenty of otherwise healthy people cannot look upward for any length of time without dizziness. Indeed it is beyond doubt that this factor plays a rôle in some of the "visions" seen by devotees who exhaust these muscles by prolonged staring upward at an image or shrine. The fakirs of India, for example, kneel or prostrate themselves for long periods before an idol, looking upward with fixed gaze, until the rocking of the static apparatus and the response of the cerebrum brings to them a degree of vertigo with visions of whatever spirits they have in mind. Sensitive, neurotic, high strung persons are of course more easily affected in this way and are therefore regarded as more "psychic" or mediumistic. The hypnotist plays on the same weakness by making his subject gaze steadily upward at some bright object while "getting him under the influence." The exhausting excursions of the eyes in following the movements of a swaying mirror will cause vertigo in some persons.

Finally in reviewing the list of causes from which vertigo results in various cases we find arteriosclerosis occupies a prominent place; likewise the direct and reflex effects on the circulation associated with the climacteric and traumatic neuroses, especially in head injuries, although the ear may have escaped direct damage. Toxic conditions, a fruitful source, may be divided into two classes: 1. Toxins producing temporary effects in the labyrinth and associated nerves. Alcohol and tobacco are familiar examples of this. They probably cause some neuritis of the eighth nerve as well as disturbing the vestibular apparatus. A drunken man gives increased reaction in nystagmus, etc., to the turning and caloric tests. 2. Toxins causing some definite and lasting damage to the ears. Syphilis, rheumatism, the exanthemata, focal infection, and autointoxication from the intestines or renal apparatus are examples. Vertigo may come from a tumor in any part of the brain if pressure is sufficient and of rapid increase. It occurs most in cerebellar tumors. Examination of the eye grounds for pressure signs is an aid in clearing up the diagnosis of such a case. Bárány used to tell us that spontaneous nystagmus on looking upward was always a reliable sign of trouble below the tentorium.

SUMMARY.

1. The most frequent cause of vertigo is some fault in the internal ear, especially progressive degenerative disease.

2. In a case of dizziness, if labyrinthine tests are normal in vertigo and nystagmus, there is no fault here and the vertigo is due to something irritating the static apparatus.

3. If vertigo alone or nystagmus alone is produced by the tests the fault is outside the labyrinth itself.

4. If tests show no reaction in vertigo or nystagmus the fault lies in the labyrinth or in the eighth nerve.

5. Hemorrhage into the labyrinth is a rare condition. Emboli lodging in the labyrinthine bloodstream are a cause of Menière's syndrome as seen in caisson workers.

6. The eye is next in importance to the internal ear as a source of vertigo and should receive full attention after the labyrinthine condition has been tested.

7. Aside from paralysis a common fault in the ocular muscles is weakness of a superior rectus with imbalance—hyperphoria. Vertigo on looking upward is therefore frequently met with. Even when lacking a frank fault—hyperphoria—the elevators of the eyeballs are the least able to do their work and suffer most through exhaustion by the efforts required of them.

1125 BOSTON ROAD.

WANDERING DROPSICAL GALLBLADDER.*

Report of a Case.

By J. LEWIS AMSTER, M. D.,
New York,

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A review of the literature shows that wandering gallbladder is not exceptionally rare. A differential diagnosis is sometimes difficult, as this condition may be mistaken for floating kidney, ovarian cyst, etc. It is unnecessary to dwell upon the anatomy of the gallbladder and biliary system, as the relations of the organs in the upper right abdominal quadrant are well known.

Gallstones sometimes lie dormant in the gallbladder for years, and shortly before operation may give rise to symptoms. Sooner or later many of these patients have pain and discomfort referable to the upper right quadrant which are due to inflammation or obstruction in the gallbladder or biliary tract and the symptoms are often slight in the beginning, "dyspeptic" in character, but as soon as obstruction of the biliary flow occurs, the symptoms become more pronounced and persistent. A clinical diagnosis of cholecystitis is often made, but as a matter of fact, one cannot say with reasonable certainty that gallstones are present unless the abdomen is explored. Hesse (1) summarizes 17,402 autopsies done in ten years in Petrograd and found gallstones in less than three per cent. The Johns Hopkins and Mayo clinics indicate that their figures are considerably under ten per cent. The statistics prove that shadows of biliary calculi are seen roentgenologically in a small percentage of cases.

Hydrops of the gallbladder may be due to obstruction from within or without the cystic duct. Acute cholecystitis with accompanying inflammation of the cystic or common bile duct may cause edema

*Read in part at the Clinical Meeting of Lincoln Hospital, October 1902.

of the valves of Heister, the convolutions of mucous membrane of cystic duct, resulting in temporary obstruction. This inflammation sometimes predisposes to ulceration and cicatricial contraction, which may finally result in occlusion of the cystic duct with permanent hydrops. A dropsical gallbladder may become more and more distended, until it occupies almost the entire abdominal cavity.

G. G. Ross (2) operated upon a patient in the German Hospital, of Philadelphia, in whom the distended gallbladder, which was full of pus, had reached the brim of the pelvis. Somewhat similar cases have been observed by Collinson, Erdmann, Tait, and Terrier. A stone or several stones may become impacted in the cystic duct, causing enormous distention of the gallbladder, or the duct may be occluded by cicatricial bands or adhesions from without, which sometimes develop after pericholecystitis or some other inflammatory process in this region.

An overdistended gallbladder will tend to drag as a result of its own weight, and it may eventually become so movable as to strip its peritoneal attachment from the under surface of the liver. This peritoneal support may sooner or later be transformed into a distinct mesentery and the continuous sagging of the organ may eventually predispose to torsion or volvulus of the gallbladder.

The gallbladder, like the urinary bladder, is composed, to a great extent, of elastic and muscular tissue, which allows for a considerable amount of distention. It is known that a normal

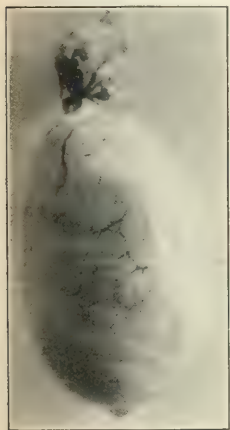


FIG.—Photograph showing impacted bloodvessels in the wall of the gallbladder. Note dilatation of the cystic duct which is obstructed by an impacted gallstone.

gallbladder, when dried and distended with air, will stand a pressure of 100 pounds without bursting. We can readily understand that indirect force sufficient to produce rupture can occur only under extraordinary circumstances. Traumatic rupture of the gallbladder is not an infrequent occurrence, and when it does happen, it usually takes place close to the cystic duct. Desrosiers (3), in 1894, collected a series of twenty-five cases of traumatic rupture, thirteen of which were caused by falling on the abdomen, ten by a blow, one the result of a runaway accident, and one the outcome of a buffer accident. This condition is more apt to occur when the gallbladder or biliary ducts are inflamed behind an obstruction, than when the biliary system is normal. In the above series reported by Desrosiers, thirteen patients died. Aspiration was attempted in twelve cases with four deaths.

A dropsical gallbladder may distend rapidly when complete obstruction takes place near the cystic duct, without any apparent acceleration of pulse or elevation of temperature. These phenomena are

explained by the fact that the gallbladder is not richly supplied with lymphatics and its contents are not under great tension; therefore it does not absorb bacteria or their toxins rapidly enough to cause any bodily disturbances. Many times the acute symptoms, such as pain, rigidity of the upper right rectus, etc., may disappear, leaving the so called "cystic gallbladder" which remains slightly tender to pressure for some time. The contents of this well defined globular mass may remain a clear mucoid material without the presence of bile, or it may go on to suppuration, resulting in empyema of the gallbladder. With an infection of this character, one would naturally expect the symptoms that ordinarily accompany a pus collection elsewhere. On the contrary, the temperature accompanying such a grave infection seldom rises above 101° or 102° F. and the pulse is slightly quickened. The septic symptoms are not in evidence because the lymphatic gland is so situated beyond the obstruction, as to prevent it from absorbing any infectious material. On the other hand, an impacted stone in the neck of the gallbladder may ulcerate through into the peritoneal cavity, giving rise to symptoms of septic peritonitis. Stones may work themselves loose and pass through the common duct and into the intestinal canal or a spontaneous anastomosis may be produced between the gallbladder and gut—cholecystoenterostomy—thereby establishing a free exit of bile into the bowel. If the stone is large enough, it may cause obstruction to take place in any part of the intestinal tract.

Harry C. Watson at a recent meeting of the Alumni Association of St. Mark's Hospital reported a case of incomplete intestinal obstruction due to the lodgment of a gallstone in the rectum, which could be palpated with the examining finger. This patient gave a history of biliary trouble with accompanying jaundice and obstipation. A cylindrical shaped gallstone one and a half inches long and two and three fourths inches in circumference was removed from a rectum with the aid of forceps, and the symptoms of obstruction and jaundice soon cleared up. Rokitsansky states that a calculus the size of a hen's egg may pass through the bile ducts. Of 1,541 cases of intestinal obstruction of different causes, forty-one were produced by gallstones. In a series of cases collected by Wising, out of fifty-one patients with intestinal obstruction due to biliary calculi, thirty-eight died. I desire now to call attention to the following interesting case:

CASE.—Mrs. M. S., fifty years old, whose general condition was not very favorable, was seen by me on May 10, 1916. This patient was a small emaciated person, weighing 105 pounds who suffered from "indigestion" as far back as she could remember. These attacks, in the past year, became more acute, lasting two or three days and coming on at intervals of a month or six weeks. Recently, she had three distinct attacks of biliary colic within a period of one month, accompanied by intense jaundice. The icterus cleared up after each attack but the pains and tenderness over the gallbladder region were more or less persistent. The last attack had begun a few days before I saw her. She had retching, nausea, and vomiting, severe colicky pains over the region of the gallbladder. These radiated backward under both scapulae and were accompanied by chills, slight elevation of temperature 101° F. and subnormal pulse rate 68. She was sent to the hospital immediately, and on admission her blood examination showed a leucocyte count of 17,000, eighty-one per cent. polymorphonuclears. There were traces of bile in the

Other organs did not show the presence of gall stones. Physical examination revealed a thin abdominal wall with a distinct mass, in the gallbladder region, which moved up and down with each respiratory movement. This tumor was freely movable and it could be shifted to the left of the median line, downward toward the pelvis and in other directions. It was globular in outline and cystic in character. It would recede to the liver region after manipulation. The tumor was tender to touch and it could be palpated as a separate mass from a floating right kidney.

The patient was prepared for operation the next morning. A vertical incision, about five inches long, was made through the right rectus near its outer border. On opening the peritoneal cavity the liver presented itself at a low level and a large globular mass was found attached to the under surface of the liver by a pedicle, which proved to be the gallbladder with a distinct mesentery and an elongated cystic duct. A careful search for the appendix was then made, which showed evidence of chronic inflammation. The appendix was shelled out of a bed of adhesions and removed in the ordinary way. The gallbladder was freely movable and was not adherent to the surrounding viscera. It was delivered outside of the abdominal cavity and wrapped in pads which were wrung out in hot saline. I then swept my left hand between the upper surface of the liver and the diaphragm and the liver was rotated downward and forward under cover of the ribs. [This eversion method, recommended by Tilton, is a very satisfactory way of obtaining a proper exposure of the entire biliary passages, and I have made use of this practice in many operations of the gallbladder and biliary ducts.]

Using the gallbladder as a handle, the cystic duct was put on a stretch and traced to its junction with the hepatic duct. A large stone was found impacted in the neck of the gallbladder. After further exploration, the common duct was found to contain a smaller calculus which was cautiously milked through the ampulla of Vater into the duodenum. A lap pad was packed into the right kidney pouch, another into the lower end of the wound to protect the duodenum and hepatic flexure and still another to push back the stomach. The gallbladder was almost completely invested by peritoneum, except at its mesenteric attachment to the liver. Its removal was very simple, somewhat similar to an extirpation of a pedunculated ovarian cyst. The peritoneum covering the neck of the gallbladder was split open and the cystic artery was clamped and ligated. A forceps seized the cystic duct just distal to this. The duct was divided and separate ligatures were thrown around the cystic duct and the mesenteric attachment. The gallbladder was removed and the common duct was again palpated for stones and found normal; the pancreas showed no evidence of induration or inflammation. The abdomen was closed without drainage, using continuous plain gut for the peritoneum and posterior sheath of the rectus; continuous chromic for the anterior sheath. Three interrupted retention sutures of silkworm gut were passed through all the layers of the abdominal wall excluding the peritoneum, and continuous silk for the skin. The postoperative course was uneventful and the patient made an excellent recovery.

The gallbladder from neck to fundus measured six inches, circumference nine inches, and it weighed exactly ten ounces. It was split open and found to contain a thick mucoid material and a large number of stones. The accompanying photograph shows very distinctly, the injected bloodvessels in the walls of the gallbladder. The dilatation of the cystic duct corresponds to an impacted stone in the duct.

The question of differential diagnosis was carefully gone into before operation was considered, as it was of the utmost importance to know if we were dealing with a movable kidney or an abdominal tumor. A lumbar or retroperitoneal incision would be indicated for the former and an abdominal section would be necessary for the latter. A diagnosis of wandering dropsical gallbladder was based upon the following findings: 1, a history of previous attacks of biliary colic; 2, a tumor, in the gallbladder

region, which was freely movable in all directions and which would return to the upper right abdominal position after manipulation; 3, the fact that tumor moved downward with inspiration and ascended with expiration; 4, the globular and fluctuating character of the tumor; 5, mass was somewhat tender to pressure; 6, finally, the fact that the mass could be mapped out separately from a palpable floating kidney and it apparently was not connected with the pelvic organs.

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2055 BATHGATE AVENUE.

RAYNAUD'S DISEASE.

An Unusual Localization.

By GEORGE RUBIN, M. D.,
Chicago.

The purpose of this report is to put on record a case of Raynaud's symptom complex on account of the unusual localization. The patient came to me, November 22, 1916, through the courtesy of Dr. Jacob Frank.

CASE.—J. G. C., Jewish American, twenty-nine years of age, married, cutter of clothing. His weight was 136 pounds; height five feet, four inches. He was one of thirteen children all of whom were well except one sister who had pulmonary tuberculosis. The family history in other respects was unimportant. The patient was a very moderate drinker and smoker; he was a heavy meat eater. He had a Neisser infection fifteen years ago; typhoid ten years ago; no lues. He was constipated, and the appetite was good. He slept well except when disturbed by pains in the joints. The tonsils were extirpated three months ago at the Presbyterian Hospital for the purpose of removing the cause of the joint trouble. Examination showed a well nourished individual with good complexion and an expression of anxiety and of being in pain. Chest was normal. In the abdomen a right inguinal hernia was not fully descended. The left knee over the tibiofemoral joint was slightly swollen. There was some redness and tenderness to pressure. The right ankle was in a similar condition. Throat, mouth, and teeth were in good condition. There was no disturbance of sight and hearing. Temperature, 99.5° F.; pulse, 90. Blood examination was not made. A diagnosis of subacute rheumatic arthritis was made.

Therapy included rest, milk and vegetable diet, salicylates, and vaccine injections of pneumococcus, streptococcus, and staphylococcus. This was a stock product which, by the way, gave in former cases satisfactory results. The injections were made every fourth day, given subcutaneously and varying locations in arms, thighs, and back. A small Luer syringe with a twenty-four gauge needle was used. At the eighth injection of the vaccine, at the instant the needle was plunged into the skin, at about the level of the sixth dorsal vertebra and about two inches to the right of the spinous processes, the skin blanched to almost snow whiteness, extending to the left of the spinous processes; the appearance was almost symmetrical, except that the area to the left of the spinous processes was somewhat larger than that to the right. The whole area was about ten centimetres across and seven or eight centimetres vertically. The patient felt a sharp stinging pain not experienced on previous occasions. The ischemia was still present when the patient left the office a half hour later. The following day the area assumed a dark purple hue and the patient complained of severe burning pain and being kept awake all night. It was then evident that the case was one of angioneurosis and from general indications it corresponded unmistakably to the Raynaud's symptom complex variety. There was the circumscribed ischemia followed by asphyxia and subsequent gangrene. It was symmetrical. There was

excruciating burning pain. With the exception of the site it was a classical textbook case. The sloughing of the tissues continued for about three weeks and it healed very slowly. The skin and subcutaneous structure, including muscle, were destroyed. The scars shown in the accompanying drawing are quite deep.

This case was undoubtedly of traumatic origin caused by the needle. Several cases of Raynaud's disease caused by traumatism was reported by Kaposi and one case by Doutrelepon. That the

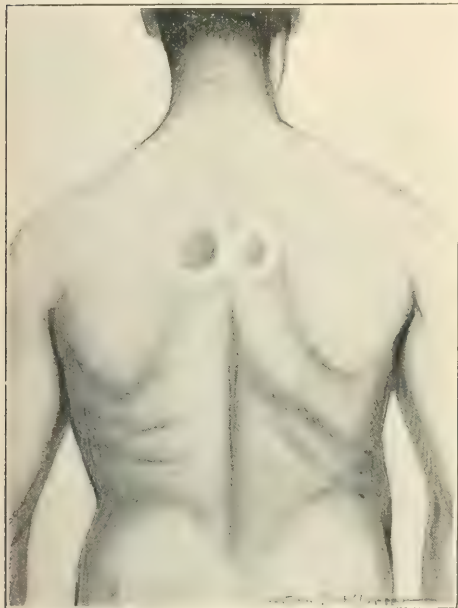


FIG. Scars resulting from symmetrical gangrene in Raynaud's disease.

traumatism is only the exciting cause of a pre-existing vasomotor disturbance is selfevident because of its bilateral manifestation and also of the insignificance of the trauma. Further evidence of the existence of vasomotor neurosis in this case was shown by a peculiar reaction of the skin when adhesive tape was removed. Instead of leaving a red mark, Doctor Frank and I observed that it became exceedingly white and remained so for a number of seconds before it assumed the natural hue.

This case was shown to the Chicago Medical Society, South Side Branch, in February, 1917, while the wounds were healing. In closing I wish to thank Dr. Zan D. Klopfer for the excellent drawing.

25 EAST WASHINGTON STREET.

Negative Sputum Examinations in Pulmonary Tuberculosis.—Morris H. Kahn (*Medical Record*, December 22, 1917) gives a table of eighty-two deaths from pulmonary tuberculosis in which twenty-eight cases, or one third, showed negative sputum findings in three consecutive examinations. This would indicate that a large proportion of all cases of phthisis show a persistent negative sputum.

KIDNEY INFECTION AS A RESULT OF PYORRHEA.

A Case Report.

BY FRANK S. CROCKETT, M. D., F. A. C. S.,
LaFayette, Indiana.

Rosenow's theory of specificity of certain bacteria for certain tissues might be applied to the case detailed below in answer to the natural inquiry arising from this history: Why were the kidneys selected by the activating organisms of this pyorrhea? The case briefly outlined here is interesting from two points of view: It was a direct result of pyorrhea of moderate severity, and the kidney when removed was found to have two pelves and ureters. About one year before the patient was advised by his dentist to have a pyorrhea of moderate severity treated. This advice was neglected. About one month before his illness he experienced a distressing automobile accident which left him nervous and easily agitated.

CASE.—The patient first complained of tonsillitis followed by soreness on the left side at the juncture of the ribs with the spine. The tonsillitis was atypical as far as I could learn and was in all probability the first febrile reaction from the infected kidney. At weekly intervals the patient had temperature elevations reaching 104° F., preceded by chill. These would last one to two days followed by several days' remission with only a fraction of a degree rise in temperature. When seen with the attending physician the patient had been removed to the hospital. He was going through the fourth and most persistent period of high temperature which continued up to operation. The urine was cloudy and cloudy urine could be seen coming from the left ureter on cystoscopy. Immediately after removal of the kidney the temperature fell to 99° F. and a fraction fluctuating to normal. When first seen, the surgical emergency was so great that the teeth were not treated before the removal of the kidney. Following operation the weakened condition of the patient made me hesitate to disturb him in any way which might be avoided. During the convalescent stage some three weeks after operation, while the patient was able to be up in a chair soreness over the right kidney developed and temperature shot up to 104°. The urine became loaded with pus. The return of fever de-

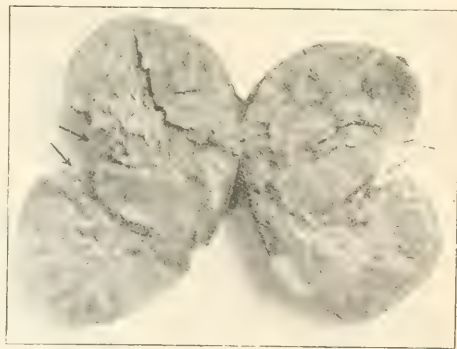


FIG. Kidney with double pelvis. Photographed after hardening in formalin solution.

manded action. His teeth being the most patent source of possible infection, they were removed promptly and my hopes were fully justified by the prompt remission of fever and pain over the remaining kidney and the disappearance of pus in the urine. The patient made an uneventful recovery.

It is possible too much enthusiasm has been given expression recently though wholesale extraction of suspected teeth and I have been a little slow to follow the many earnest advocates of this procedure but this case certainly proves, in a clinical way, that the constant bathing of the alimentary canal with pyogenic organisms from infected teeth may prove disastrous when the general systemic resistance has been lowered.

515 COLUMBIA STREET.

SAFEGUARDS IN THE MANUFACTURE OF EXPLOSIVES.*

By W. G. HUDSON, M. D.,

New York, and Wilmington, Del.,

Medical Director, E. I. Du Pont de Nemours and Company; Chairman, Subcommittee on Industrial Diseases and Poisons, Advisory Board, Council of National Defense.

In the popular mind a very exaggerated idea exists concerning the hazard involved in making the standard explosives in use today. As a matter of fact, railroading has a higher injury and death rate. If explosives like dynamite, gun cotton, smokeless powder, and trinitrotoluol, TNT, were made only by skilled chemists under the best of laboratory conditions, they would seldom if ever cause explosion accidents. They are stable and safe explosives and will stand a far greater degree of rough handling than the uninitiated have any idea of. But when such substances have to be produced in the immense quantities required by present conditions, ordinary labor must be used and many of these men are unskilled and have no speaking knowledge of English. However careful our chemists, foremen, and supervisors may be, it is difficult indeed to guard against some one of these thousands becoming careless or negligent at times, and of course the results of an explosion are visited upon all in the vicinity.

One of the first principles in safeguarding employees against explosion risks is to separate the danger buildings a sufficient distance and surround them with massive earth barricades so that an explosion in one will not be transmitted to and involve the next one. Furthermore, the number of employees in any danger building is limited to the smallest number able to do the work, making use of machinery to replace men wherever possible. The importance of this is far greater than appears at first. One naturally figures that if four men are working in a danger building and we double the number, we double the risk because we expose twice the number of men to the same danger. But the increase in risk is far greater, for with the increased number of men there is a correspondingly greater chance of some one among them being careless; therefore the risk increases with the square, or perhaps with the cube of the number of employees in a danger building. Automatic machinery which will replace human labor is much more important to the explosive industry than its mere reduction of labor cost would signify. All large manufacturers in this country employ a great deal of such machinery, most of it invented by the more ingenious among the

employees themselves. Some of these machines, when operated by one or two men, do as much as twenty or thirty workmen could do by older methods and do it better. The incentive to this kind of ingenuity is strong, for the company rewards the inventor to such an extent that he does not have to worry about his bread and butter thereafter.

Match searches, uniforms, and physical examinations are important safety measures, but there is hardly time to discuss them.

Contrary to the popular belief, explosion accidents are not the most common ones in this industry, indeed, they make up but a small percentage of the total. The more common are like those that occur in any industry where men work with tools, move weighty material, handle caustic chemicals, etc., and they are many times more frequent while the engineering department has a construction force at work building a new plant than they are after the plant is built and the actual manufacturing operations are under way. The majority of the accidents are of the most commonplace kind, like a lumberman cutting his foot while trimming a log with the adze, a punctured wound of the foot from stepping on a protruding spike, a brick dropped upon some one's head by a person working on the floor above. You may remember that some five or six years ago what has been called the "safety first" movement spread over the country. While the nature of our business had already caused us to give a large amount of attention to safety, it had up to that time been chiefly directed toward guarding against explosions. We, however, quickly joined in this movement, and a safety commission was organized. I have been a member of it ever since, but Mr. L. A. DeBlois, our safety engineer, is chairman and is credited with many original ideas. The recording and tabulating of injuries of all kinds which this commission quickly systematized soon brought to light the overwhelming preponderance of the ordinary minor accident, and we set about remedying the conditions in the same way that so many other concerns were doing.

Of course like every one else our first efforts were directed toward providing guards for gear wheels and belts, railings for stairs and platforms, goggles for lathe workers and grinders, etc.; but the tabulation of all accidents soon showed us, as it seems to have shown every one else who has made a systematic study of the subject, that only about one fifth of the accidents were due to causes that could be remedied by mechanical safeguards. The remaining four fifths were due to carelessness, negligence, skylarking, and other similar habits in the men themselves. It therefore became evident that, even after we had done our utmost in installing mechanical safeguards the accident percentage would not be reduced very far, and that in order to make any decided impression on the other eighty per cent. we would have to educate our men up to the "safety habit."

Now the first expedient that appeals to the beginner in safety work is the posting of signs. If a man gets hurt, or may get hurt, doing something in an improper way, a sign is posted warning him not to do it that way but in the right way. It looks

*Read before the Harlem Medical Association, January 2, 1918.

good at first thought, but if such a policy is followed very far you soon have your work rooms plastered over with a multiplicity of signs; and these signs quickly become like the patterns in a wall paper to the men, who see them every day in a subconscious sort of way but after a while never give a thought to their meaning. Every fresh one added detracts from the emphasis of the others. Signs alone will not do the work, and had better be reserved for a few special occasions.

To solve this problem of instilling the safety habit into the men one must make a study of their psychology. Things must be presented to them in a way they will understand, and even then if you want them to remember what has been presented you must make it interest them, or found it upon something of interest. For instance, a safety bulletin board at the entrance to the plant is a good thing if it is properly managed and kept alive. If it is filled with dry regulations and "don'ts" the whole board soon becomes a mere familiar part of the landscape, and more than ninety-nine per cent of the men will pass it by without ever stopping to read it. A live safety engineer will give close attention to this board, and never let its contents grow stale. An occasional humorous incident always attracts the men, and some of the minor mishaps can be served up in humorous style while still carrying a lesson. For instance, in one of our plants a man, in order to avoid the few extra steps necessary to reach a bridge over a drainage ditch, attempted to jump across and fell in. This ditch carried the waste from the raw cotton purification plant, a liquid about the color of strong coffee and sufficiently offensive in itself. Taking advantage of the large quantity of chlorinated lime used in the purification process, part of which still remains in solution, the tank wagons of the sanitary department dump the material they collect from the privies into this ditch, to the extent of about ten tons a day. One can imagine the condition the rescued man was in when he was fished out. The safety engineer immediately prepared this case in a series of pictures for the bulletin board, entitled, "Taking a Short Cut—Taking a Chance," and the bulletin board was quickly a centre of attraction. Before that drawing card grew stale another one was devised. The perhaps uncouth sense of humor in these men is one of the avenues of approach to their intellects.

That is the main point in the campaign of education. You must get them interested if what you want to present is to stick, and to appreciate what will interest them, life must be considered from their viewpoint. The effort is worth while, for it reaches after the eighty per cent. of accidents which remain after the utmost has been accomplished by means of mechanical safeguards. For this reason I will illustrate still another avenue of approach which may be of interest, because it takes far greater inventive talent to find a point of entrance to such intellects than it does to invent a guard for a gear wheel: The non-English speaking employee has always been the hardest to reach for obvious reasons. We found that these men were quite anxious to learn our language, and when a class in English was opened for them they flocked to it. Then the safety engineer conceived the bright idea of combining safety in-

struction with the English, and one elementary lesson will make clear the mode of procedure, as follows:

The teacher has on his table certain objects daily encountered by the men, among them a nitrating pot, some acid, and some cotton. He takes up the pot first, has all his pupils repeat the word "pot" until they can say it clearly. He does likewise with the cotton, and with the acid. Then by means of the acid and cotton he develops fumes, and with the aid of a foreigner with some ability as an actor, who pretends to inhale the fumes and become agonizingly sick, the sentence, "Fumes are bad for John and make him sick," is developed, written on the board, and fully explained. Thus at the conclusion of such a lesson the new words learned are more firmly fixed because they are associated with a definite train of thought; but more than that, this train of thought is in itself a safety lesson.

Time is too short for me to go very far into the prevention of industrial diseases due to the various dusts, fumes, and poisons encountered in the explosives industry. I would refer those interested to a paper I published (1) and since then there have been several papers on the same subject in the *Journal of the American Medical Association*. In a general way, my method of handling the problem is first to endeavor to learn from the literature and by animal experimentation what the effects of a new chemical will be before we start to manufacture it, and to convey this information to my plant physicians so that they may be prepared. Then the safety, medical, engineering, and operating departments get together and try to devise means whereby the apparatus may be so constructed and operated that poisonous dusts and fumes will not escape into the workrooms. It is only in the measure that it is impossible to accomplish this ideal that special ventilation must be provided, but when necessary the most effective principle is to remove the dust or fumes from as near the point of origin as possible by means of exhaust flues. Fumes and dusts are only part of the sources of industrial poisoning, for many of the chemicals used are actively absorbed by the skin, and besides this the men will, in spite of repeated cautioning, get their chewing tobacco contaminated by the poisons, which by this means are introduced into the stomach.

One of the subcommittees of the Council of National Defense, that on Industrial Diseases and Poisons, of which I am chairman, has recently completed a comprehensive set of standard regulations to govern these hazards, and when published they will no doubt be of interest to many of you. We followed a new scheme in this subcommittee which has already begun to get results. Instead of waiting for our recommendations to pass through the official routine which would be necessary for their enforcement, which as you all know takes time, we called a couple of conferences between our subcommittee and representatives of the munitions manufacturers. The latter accepted many of the standards we had drawn up, but objected to others. The objectionable ones were gone over, and in every case a way was found to safeguard the health of the workman in a manner acceptable to the manufacturer. After straightening out the regulations in

this manner, we secured a pledge from all present, who represented all the largest manufacturers, to put these standards into operation at once without waiting for orders from the Government. In other words, instead of sowing seeds of delay through antagonism of regulations in this most important of war industries, we have secured cooperation. Did it ever strike any of you gentlemen that of all the shortages you read about in the newspapers—of ships, of guns, of uniforms, and shoes—there is never any mention made of shortage of powder and explosives?

REFERENCE.

1. HUDSON: *Medical Record*, January 29, 1917.

120 EAST THIRTY-FOURTH STREET.

BLOOD PRESSURE IN HEAD INJURIES.

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In the middle of the eighteenth century the famous, the honest, the lovable Percival Pott walked into his clinic at St. Bartholomew's and told his students, among whom was his later rival and critic, the irascible John Hunter, the following: "The reason for applying the trepan springs from the nature of the mischief which the parts within the cranium have sustained, and not from the accidental division of the bone." This statement has never been doubted and we all realize that the accidental division of the bone is in itself a trivial occurrence, when compared to the danger occasioned by the injury to the cranial contents. Much has been written on the operative technic, the prevention of adhesions of the dura to the brain by the interposition of Cargile membrane, fascia and paraffin, the closing in of the opening in the skull with bone transplants, horn and steel or the inadvisability of attempting to close the defect at all. Have we attempted to add any concrete, definite symptoms to our classical list within the last few years and thereby succeeded in solving that perpetual enigma in surgery, the diagnosis of the borderline cases of concussion, contusion, and compression.

Three symptoms have been added—a high systolic blood pressure during the third stage of cerebral compression, the findings of the ophthalmoscope, and increased pressure of the cerebrospinal fluid at lumbar puncture, as registered by means of the spinal mercurial manometer. The ophthalmoscope is a valuable aid after the first six hours, but before this it is rare for it to reveal definite signs of increased intracranial pressure. The recording of the pressure of the cerebrospinal fluid by means of the spinal mercurial manometer has been brought forth as a means of diagnosing increased intracranial pressure before medullary involvement is evident. This is a dangerous and fallacious teaching since many investigators have found that lumbar puncture does not give any very certain measure of the pressure inside the skull, as the pressure may fall very quickly in the spinal cavity, and remain high in the cranial cavity. Sahli and Kocher have both warned against this method of diagnosis. It has been most

noticeable in the cases reported by the surgeons using this method as a means of diagnosing intracranial pressure before medullary symptoms are present that operation has been deferred until medullary involvement was apparent although the pressure of the cerebrospinal fluid registered as high as sixteen millimetres. It can not then be rightly urged as a positive diagnostic measure in this class of injuries either when used alone or in conjunction with the findings of the ophthalmoscope.

With the advent of the sphygmomanometer we were told that a high systolic pressure was symptomatic of cerebral compression and with our usual tranquility of mind, we accepted it without question because we were wearied by the long scientific discussions of medical enthusiasts pertaining to the causes of high and low pressure. This was a vicious fatigue. As the investigations on blood pressure advanced, it was proved that the systolic pressure was the final result, the sum total of all the influences operating to obstruct the bloodstream, and is the resistance offered by the vessel walls, plus the power of the left ventricle, plus the influence of the vasomotor system; it is therefore composed of the diastolic plus the pulse pressure. We sat impotently by, however, instead of investigating to find out whether the high systolic pressure was due to a high diastolic or a high pulse pressure or a combination of the two. In a large number of cases of traumatic cerebral compression it was noticed by many observers that the systolic pressure was not high enough to be of diagnostic import, often registering about 150° to 160° higher than normal it is true, but too low to be of any value in determining the degree of compression.

The sphygmomanometer then descended to its position of a stage property used in lieu of the high hat and frock coat of our predecessors patiently abiding its time to follow them into the discard as the curtain went up and the scenery was exposed. Stabilizing was needed here as elsewhere in medicine when a new instrument, drug, or operation is in vogue; and when all the nonsense about blood pressure wore off it became necessary to dissect the systolic pressure in order that we might find out at the bedside whether the rise was due to the diastolic or the pulse pressure and to arrange definitely those types of injury in which we may expect a rise and those in which it will remain about normal.

Broadly speaking, it has been my experience that in a severe fracture of the base the blood pressure readings are of no diagnostic value whatever. The other symptoms are usually pronounced, however, and bleeding occurs from the nose, mouth, or ears, and in cases where the ethmoid, the accessory sinuses, the Eustachian tube or the tympanic cavity have been implicated, extravasations occur under the orbit, eyelids, or conjunctiva, and to the surface over the mastoid. The reason for the blood pressure readings being of little or no value is due to the fact that in widespread hemorrhages due to basal fractures, bulbar symptoms may not occur until late, owing to the equalized pressure exerted against the cerebrum, and when they do occur the patient passes rapidly through the early stages into the last stage with low blood pressure and rapid

pulse due to the great severity of the injury. The following cases illustrate the types of basal fracture frequently seen:

CASE I.—S. D., an Italian, was struck on the head with a stone in a quarry. He was brought to the hospital in a semicomatose condition with pulse 140, systolic pressure 128, diastolic 84, pulse pressure 44. There was bleeding from the right ear and ecchymosis over the mastoid. The skull was trephined over the temporal region and there was a tremendous subdural hemorrhage when the temporal lobe was raised. A fracture of the base could be felt with the finger. A rubber tissue drain was inserted under the temporal lobe. The patient recovered.

CASE II.—B. P., a Russian, was struck on the head with a plank which was thrown from a ship. He was admitted to the hospital in a comatose condition with bleeding from the right ear and ecchymosis over the right mastoid region. There was a huge hematoma on right side of head. Pulse, 100; systolic pressure, 110; diastolic, 90; pulse pressure, 20. The skull was trephined over the right temporal region and a fracture was found running down into base of the skull, with a vast amount of extradural and subdural hemorrhage extending over whole side of brain. A rubber tissue drain was inserted under temporal lobe. The patient recovered.

These two cases serve to illustrate the average blood pressure readings in severe fractures of the base. The blood pressure has been taken in many cases and in no case was it indicative of the amount of trauma or compression of the brain. Are there any cases in which the ordinary symptoms of compression are insufficient to indicate the necessity for operation and where another symptom of compression would be of value? There are very many indeed. In the vast majority of cases, we are unable to determine whether the patient was unconscious immediately after the injury, had a free interval of consciousness, and again lapsed into an unconscious state for the reason that he is often unconscious when we see him or in such a state of mental dullness with loss of memory of the events following the injury that he is unable to give us a history. If he is unconscious it may be due to concussion since coma lasts for several hours in severe cases of concussion or it may be the deep sleep of intoxication.

I have operated in three cases where no blood pressure records were taken in which the symptoms were so puzzling that a positive diagnosis was not made until the skull was opened. Two of the cases had extradural hemorrhage and were trephined because they were in a semicomatose condition for forty-eight hours. All other symptoms of compression were negative and in one case the man had been drunk when he fell so that it was impossible to determine for the first day whether his lethargic condition was due to alcohol or compression. Operation in both cases revealed a ruptured middle meningeal artery. Both patients recovered. In the third case we were unable to decide whether the patient, who was unconscious and in convulsions, was suffering from an injury to the head sustained in a fall of forty feet an hour before his admission, or from traumatic epilepsy following an injury a year previously. He had no other important symptoms except the coma and convulsions. Operation revealed an adherent dura under the old scar. He died within twenty-four hours, and it was learned from his relatives that he had been subject to epileptiform seizures for the last six months.

Certainly no more final proof is needed than these three cases, which are not unusual types, to settle in our minds absolutely that the ordinary symptoms are not enough to make a definite diagnosis of compression in borderline cases. Lumbar puncture was not performed in any of these cases, and from a diagnostic standpoint would have been of no value since in two of the cases the hemorrhage was extradural in type and in the third no hemorrhage was present. In subdural hemorrhage a lumbar puncture may show the presence of blood but is of no benefit in aiding us to decide whether an operation will be of service since it does not show the degree of compression. This applies to its use as a therapeutic measure. It is of some value in the treatment of subdural hemorrhage, but I have never seen any statistics where it has been used in the treatment of all classes of injuries to the brain, in which I have not noticed cases among the deaths where no post mortem has been made and which in my judgment were undoubtedly due to extradural hemorrhage.

A trephining operation would have saved most of these cases. Lumbar puncture is not without some attendant danger, since deaths have been reported due to constriction of the base of the brain in the foramen magnum. Schonbeck reviewed the literature on the danger of lumbar puncture from Quincke's first report on lumbar puncture in 1891 listing 137. He gives summaries from the records of seventy-one deaths following lumbar punctures. The following conclusions were reached: "There do not seem to be any absolute contraindications, but it is safer not to apply lumbar puncture in case of hemorrhage in the skull or vertebral canal, or intracranial tumors, especially those in the posterior fossa" (1). The brain with its vessels and a small amount of cerebrospinal fluid completely fill the cranial cavity. Any encroachment upon this space makes room for itself by squeezing the blood out of the vessels. When it is a local disturbance the compression effects diminish with the distance from the primary seat of pressure, but in case of high degree of pressure they are felt throughout the entire cavity. Any such encroachment affects the cerebral circulation and it is the circulatory disturbance which plays the chief rôle in eliciting the phenomena of compression. The compression may occur either through the presence of some foreign substance or the abnormal accumulation of some substance already present. The latter type of compression does not present the same type of symptoms as the former, since the accumulation may be slow or may destroy the brain substance during its growth, and thus make room for itself. We are more interested in the former since it represents the acute type of compression, and blood pressure readings are more directly comparable with acute compression.

Any encroachment on the intracranial space, as a general rule, will drive out of the chamber the small amount of cerebrospinal fluid which is usually present; sometimes, however, compression may be associated with an increase in fluid, as in acute traumatic edemas—traumatic serous meningitis. This occurs as a result of the obstruction to the

flow of fluid into the sinuses due to swelling or displacement of the brain and obstruction of the foramina. If the fluid is driven out, as usually occurs, a further encroachment occurs by driving the blood out of the bloodvessels, and the cerebral veins are the first to suffer, since the tension is lower than in the arteries. If the compressing force continues to become greater, the pressure is brought to the tension in the arteries, and cerebral anemia results with loss of function in those parts of the brain whose circulation has been shut off for any length of time. Owing to the falx and tentorium cerebelli, pressure over one part of the brain may only result in a local anemia, and not affect the other parts of the brain, the most important of which is the medulla.

Since the vital centres in the medulla are the main factors to be considered, it may readily be inferred that a local compression of the medulla is just as serious as a general compression of like degree; whereas, over the hemispheres a much lighter grade of local compression is possible without producing death. It has been stated that when subtentorial tension, or the pressure against the medulla, reaches the arterial pressure, death must ensue in consequence of anemia of the vital centres. Certain reservations may be made to this statement, for if it implies normal arterial pressure, it is erroneous. For when the external pressure against the medulla begins to approach or equal the arterial tension, the anemia stimulates the vasomotor centre, and the medullary centres are again sufficiently well supplied with oxygenated blood (1). The progressive rise in tension of the circulating blood is due to constriction of the splanchnic field. During the period of falling of the blood pressure anemia results, and the respiration fails; when the arterial pressure rises again the medulla is resupplied with blood and respiration is resumed. Finally the time comes when the regulator mechanism is no longer efficient, and then, whether from a further increase in external pressure, or from fatigue of the vasomotor activity, the arterial pressure drops permanently below the level of the pressure exerted against the medulla; anemia results, the respiratory centre fails, and the heart keeps on beating as an isolated organ, uncontrolled by vagus or vasomotor activity, until after a variable time, with fall in pressure to zero, it ceases altogether through asphyxiation.

In view of the gradations of circulatory disturbance, as well as of the symptoms they occasion experimentally, Kocher in his comprehensive monograph, has endeavored to subdivide the progressive phenomena of compression into four stages, and for purposes of clinical designation, it is convenient to have such a classification of cases or of stages of the individual. His first stage corresponds with the mild stage of compression, or with the early stage of what may become a severe grade, in which the pressure exerted against the brain by the foreign substance is not sufficient seriously to compromise the circulation. By the escape of cerebrospinal fluid with a narrowing of the venous channels, the process is accommodated with nothing more than a certain degree of venous congestion, which may be local. Symptoms are in the main insignificant, par-

ticularly if the process is remote from the medulla. There may be some headache, possibly certain focal symptoms referable to the site of the lesion, some mental dullness, and little else. There is but slight interference with the circulation of the brain as a whole. His second stage corresponds with the beginning failure of circulatory compensation. There is sufficient venous stasis to lessen the normal amount of blood flowing through a considerable part of the capillary field. Headache is more pronounced, and there may be vertigo, restlessness, a disturbed sensorium with excitement or delirium, and unnatural sleep. Other and objective symptoms become manifest, particularly shown as a slight venous stasis of the extracranial vessels. The face appears somewhat cyanotic, the venules of the eyelid are dilated, and of greatest import, a distention and tortuosity of the veins radiating toward the optic papilla, with or without evidence of beginning edema of the nerve head, may be found on ophthalmoscopic examination. Indications that the venous congestion is affecting the medullary circulation is shown by a slow pulse, and possibly slight rise in blood pressure. His third stage corresponds with the stage of widespread capillary anemia brought about by further increase in tension. Here the medulla will not have escaped even though the lesion causing the pressure is a focal one and lies remote from the hind brain. The period of vasomotor regulation has set in with its high blood pressure, and this, combined with its vagal quality, gives to the pulse its so called "bounding" character. The rise in arterial pressure may exhibit fluctuations in level, which can easily be recorded on a sphygmomanometer, even when they are not appreciated by the finger. These are accompanied by rhythmicities in respirations which may acquire the typical Cheyne-Stokes type with periods of absolute apnea; by rhythmic alteration also in the size of the pupils by a wavering increase and lessening of the depth of stupor, so that with the up wave in pressure, the patient may moan, become irritable, and thrash about, and with the down wave be deeply comatose; and by other signs indicative of the vasomotor rhythm. The pulse is slowed even to forty or fifty beats a minute. The choking of the optic discs is more pronounced. The reflexes may become abolished. Cyanosis of the face is extreme, the respiration snoring, and the patient approaches the brink of failure of the regulatory vasomotor responses. In the fourth or terminal stage compensation on the part of the arterial tension now shows signs of failure; there are irregular cardiac and respiratory efforts; the pulse grows rapid; the coma deepens; there is complete muscular relaxation; the pupils become widely dilated; and with the fall in blood pressure, there is cessation of all cerebral function with respiratory paralysis.

This brief review of the phenomena which have been experimentally observed may suffice to show, as Leonard Hill has emphasized, that compression symptoms are not due to mechanical excitation or to structure injury, but, on the contrary, to circulatory disturbances—a primary venous stasis, resulting finally in capillary anemia. It serves also to point out the differences between a local and a

general increase in tension; it shows that anemia of the medulla plays the chief rôle in eliciting the so called major or bulbar symptoms of compression, namely, the high blood pressure from stimulation of the vasomotor centre, the slowed pulse from vagal stimulation, and the rhythmic respiration of the Cheyne-Stokes type, which hinges on the fluctuation and level of the raised arterial tension, which for a short period leaves the respiratory centre anemic and then resupplies it with activating blood (2).

The pressure alluded to is generally conceded to mean the systolic pressure. The systolic pressure in cases of traumatic compression of the brain is in the vast majority of cases increased, but not enough in the early stages to be of diagnostic importance; later it may rise to a marked degree, but by that time the patient has lapsed into a comatose stage from which he can not be aroused. It has been my experience that when a patient in this condition is wheeled into the operating room and trephined he rarely regains consciousness. The systolic pressure is the sum total of all the forces operating to obstruct the bloodstream being composed of the diastolic plus the pulse pressure and when we split this same systolic pressure up into its component parts in order that we may study their diagnostic value, we make some very interesting observations. We decide that we have been reaching the conclusion that the systolic pressure is of little if any diagnostic value in cerebral compression without being aware that any conclusion is nothing more or less than a synthesis of facts. We decide that we have been trying to mount a stairway without touching any of the steps. We decide that we have been studying the systolic pressure when we should have been studying the pulse pressure.

Now the diastolic pressure represents arterial resistance or potential energy. "The pulse pressure is the difference between the maximum pressure exerted by the kinetic energy of the blood column and the minimum pressure or potential energy exerted by the vessel walls. It represents the intermittent burden of pressure imposed on the artery by the heart's energy in systole in order to force the blood toward the periphery and maintain the circulation. The pulse pressure may, therefore, be defined as the amount of pressure exerted by the heart during systole in excess of the diastolic pressure. It measures the excess of dynamic over potential energy. The systolic and pulse pressures represent myocardial values, while the diastolic pressure represents arterial resistance. Incidentally it may be mentioned that the pulse pressure is that part of the heart's energy, which produces the distention of the arteries which is recognized as the pulse" (Stone). The slow bounding character of the vagal pulse is familiar to all of us. This observation is as old as the literature in surgery. Generation after generation have counted the rate of the pulse and recognized the great diagnostic significance of a slow pulse in cerebral compression. They have always been satisfied with the term "bounding," however, without attempting at the bedside to determine the degree of fullness. If we have an

instrument which will record accurately the degree of fullness of the pulse, it is our duty to use it. The day has passed when we are to rely upon our finger for such information, the patient taken into the operating room and the doctor proud of his boldness and daring falls upon the victim and with much tearing, rending, and crushing triumphantly tears off a piece of skull to find no compression present.

The sphygmomanometer has proved itself to be an instrument of great accuracy in recording the pulse pressure and when used for this purpose in cerebral compression ascends from its lowly position of a compressed air toy to that of a scientific instrument of tremendous value. This is borne out in theory and practice. Knowing that the systolic pressure is composed of the diastolic plus the pulse pressure we are not surprised to find that the systolic pressure is not greatly increased in the early stages even though the pulse pressure is far above normal, since the resistance of the arteries may be below normal and a low diastolic pressure will be recorded. Practically we find that this is exactly what happens in most of the cases when studied at the bedside. A relationship exists, according to Faught, in normal individuals between the pulse pressure, the diastolic pressure, and the systolic pressure which is approximately as follows: Pulse pressure : diastolic : systolic :: 1 : 2 : 3. Clinically we find this relationship greatly distorted in traumatic compression of the brain with medullary involvement. The diastolic is lower and the pulse pressure higher in proportion than in normal individuals. The systolic is generally raised on account of the disproportionately high pulse pressure, but is not as high as we would expect because the diastolic is lower than normal. I am firmly convinced that the degree of fullness is of as much importance as the rate of the pulse, and furthermore there appears to be a distinct relationship between the two.

You may well ask why we have a low diastolic pressure, especially since I have previously remarked that strong impulses were sent out to stimulate the bloodvessels to contraction as medullary involvement progressed. The stimulations, however, are sent directly to the splanchnic field, and our blood pressure observations are not made of the splanchnic vessels, but of the brachial artery. You must remember that the vasomotor system is the principal means of compensation in all the various crises occurring in the normal and pathological states. When the blood pressure is falling in one territory of the circulation, an increased vasomotor action may compensate; if the area of the skin is dilated, the contraction of the splanchnic region may compensate and vice versa (3). It is a well known fact that the more dilated a vessel is and the nearer it is to the surface the less pressure it requires to obliterate it. Therefore, when the peripheral vessels dilate, the diastolic pressure will be proportionately low. But in forecasting or preparing the profession for any new diagnostic method which may be used at the bedside by every practitioner, whether in the magnificently equipped hospital or at the crossroads, it should be the practice of wise physicians to take into account not the sentiments, declarations, and attitudes of the pass-

ing hour, but those moving and impelling forces, working silently in the laboratories, which sweep the thoughts of the profession on with irresistible power. In a series of laboratory experiments Crile has shown that in asphyxia, in reflex inhibition in the administration of saline infusion, in cerebral compression, the pulse wave was increased in length, all conditions where stimulation of the vaso-motor centres has occurred.

The estimations should always be taken by the auscultory method. The cuff is applied to the upper arm, air is pumped in until the pulsation at the bend of the elbow ceases to be felt. A stethoscope is placed, without pressure, at the bend of the elbow, slightly to the ulnar side, and the air is allowed to escape. The first sound which reaches the ear is the systolic pressure, provided that it is from the vessel itself, and not from the cuff.

Certain sounds, tones, murmurs, synchronous with the heart beats reach the ear as the pressure becomes less within the cuff. These sounds are divided into the first phase tones, the second phase murmurs, the third phase tones, the fourth phase dulling of the tones, and the fifth phase silence. In this series, the last sound heard just before silence was the point at which the diastolic pressure was taken.

CASE III.—B. J., male, struck from behind by an automobile, had a depressed fracture of the frontal bone into longitudinal sinus. On the second day he lapsed into a semicomatose state. Blood pressure: systolic, 130; diastolic, 80; pulse pressure, 50. Pulse, 48. Operation consisted in trephining over the depressed fragment and removing the bone. The longitudinal sinus was packed with iodoform gauze. Recovery was uninterrupted.

CASE IV.—C. A. was struck on the head with a stone in a quarry and brought to the hospital in an unconscious state. There was injury to the right parietal region, but the scalp was so infiltrated with blood that it was impossible to feel any depression. Blood pressure: systolic, 160; diastolic, 85; pulse pressure, 75.

Pulse, 60. Operation consisted in trephining; there was subdural hemorrhage and the right lateral sinus was ruptured while trying to free a depressed fragment of bone. The sinus was packed with gauze. The patient had convulsions for two weeks following, thirty-six in twenty-four hours, but finally recovered.

CASE V.—J. B., male, aged seventy-five years, fell downstairs and sustained an injury to the right parietal region. Blood pressure: systolic, 150; diastolic, 60; pulse pressure, 90. Pulse, 65. The skull was trephined and a subdural hemorrhage occurred. The patient died in twelve hours.

CASE VI.—J. McK., a boy, was struck on the head with a stone and was unconscious for several hours. When brought to the hospital examination revealed injury to right parietal region with depressed fragment of bone. Dr. George L. Armitage operated. A depressed fragment of bone was removed. The brain was severely lacerated and subdural hemorrhage occurred. A drain was inserted into brain substance and the dura was left open. The case progressed well for one week, when symptoms of meningitis developed. The wound was reopened and a hemostat pushed into the opening in brain; a large amount of cerebrospinal fluid was drained off. A piece of rubber protective was inserted in the opening for drainage, which was renewed daily for ten days. The patient recovered. Blood pressure before operation: systolic, 110; diastolic, 60; pulse pressure, 50. Pulse, 58. Blood pressure after operation: systolic, 90; diastolic, 60. Pulse pressure, 30; pulse, 72.

CASE VII.—W. C., a child five years old, was found unconscious in a field, having met with an unknown accident, but supposed to have been kicked by a horse. He had been unconscious three hours when sent in to the hospital. About the fifth hour coma began to deepen with stertorous breathing. Examination of the left parietal region

revealed hemorrhagic infiltration of scalp and depression in skull. Pupils were unequal and left pupil reacted sluggishly to light. There was no paralysis. Blood pressure: systolic, 100; diastolic, 60; pulse pressure, 40. Pulse, 83. Blood pressure next day: systolic, 97; diastolic, 55; pulse pressure, 42; pulse, 92. This patient was not operated on and made an uninterrupted recovery. This case undoubtedly had some compression, as shown by the long period of coma and the high pulse pressure in proportion to the diastolic and systolic pressures. Medullary involvement was not severe, however, since the pulse rate was decidedly higher than the pulse pressure.

CASE VIII.—P. H. was struck in the head with a flask in a foundry, and was unconscious upon admission to the hospital. The whole right parietal region was crushed and there was bleeding from ears, nose, and mouth. Blood pressure: systolic, 198; diastolic, 63; pulse pressure, 135. Pulse rate, 65. The patient died in a few hours.

CASE IX.—C. A., a woman, was shot in the skull. The bullet entered below the right malar bone. X ray showed the bullet in the posterior part of the brain. When admitted there was paralysis of the left arm and leg, which cleared up in several days. Blood pressure: systolic, 118; diastolic, 68; pulse pressure, 50. Pulse, 80. This case undoubtedly had some compression, as evidenced by a pulse pressure out of proportion to the diastolic and systolic pressure and the paralysis of the left arm and leg. The medullary involvement was not severe, however, as shown by the high pulse rate in relation to the pulse pressure. The patient was not operated on; she recovered and left the hospital in a few weeks.

CASE X.—P. R. fell from an automobile and struck his head on a paved street. He was semicomatose when admitted. Blood pressure: systolic, 122; diastolic, 58; pulse pressure, 64. Pulse rate, 58. The skull was trephined; the middle meningeal was ruptured with a large amount of extradural hemorrhage. The patient recovered.

CASE XI.—D. L. fell from a street car, alighting on his head. He was first seen twelve hours after the accident in a semicomatose state, from which he could be aroused with difficulty. Blood pressure: systolic, 122; diastolic, 68; pulse pressure, 54. Pulse, 60. In twenty-four hours he was still comatose and his pulse had dropped to 56. Blood pressure: systolic, 120; diastolic, 80; pulse pressure 40. This case gave me a great deal of anxiety, but I finally decided not to trephine him on account of the normal pulse pressure. He recovered.

CASE XII.—M. S. fell downstairs while drunk, and was admitted to the hospital unconscious. Fractured in posterior part of parietal region; right side was depressed; right pupil was small; left, large. Blood pressure: systolic, 140; diastolic, 70; pulse pressure, 70. Pulse rate, 70. The patient died in three hours.

CASE XIII.—L. P. had a gunshot wound in the left temple. He was unconscious when brought to the hospital. Blood pressure: systolic, 220; diastolic, 20; pulse pressure, 200. Pulse, 60. He died in two hours.

CASE XIV.—C. P. had a bullet wound in his head. The bullet had entered the right ear and passed into the skull just above the mastoid eminence in the vicinity of the lateral sinus. When admitted he was in a slightly drowsy state. Blood pressure: systolic, 148; diastolic, 85; pulse pressure, 63. Pulse rate, 80. It was decided to wait, although it was certain that some pressure was present. In twelve hours the systolic was 112; diastolic, 68; pulse pressure, 44; pulse rate, 80. The next day the systolic was 120; diastolic, 80; pulse pressure, 40; pulse rate, 76. The x ray showed the bullet in the posterior part of skull under longitudinal sinus. We did not operate, and the patient recovered.

CASE XV.—J. G. fell from a beam on a ship and alighted on his head. He was unconscious when admitted. There was a laceration in the left occipital region but no fracture was palpable. The left pupil was small and the right pupil large. The right arm was paralyzed. Blood pressure: systolic, 150; diastolic, 65; pulse pressure, 85. Pulse rate, 44. He was trephined and subdural hemorrhage occurred. There was a fracture over the left temporal region. He died in three hours.

CASE XVI.—R. F. fell from a jitney and was dazed when admitted and bleeding from the right ear and nose. There were no external signs of injury. Blood pressure: systolic, 122; diastolic, 58; pulse pressure, 64. Pulse, 51.

His mind was clear the next day and his general condition good. Operation revealed a fracture of the right temporal bone and great amount of extradural hemorrhage. The dura was opened, revealing subdural hemorrhage also. Rubber tissue drain was inserted under the temporal lobe. He recovered. Blood pressure after operation: systolic, 120; diastolic, 75; pulse pressure, 45. Pulse, 68.

CONCLUSIONS.

Blood pressure readings are only of negative value in head injuries where compression of the brain with medullary involvement has not occurred. In severe fractures of the base with widespread hemorrhage, blood pressure readings are valueless. In all other fractures of the skull with compression and medullary involvement, blood pressure readings form one of our most important symptoms, but contrary to all teachings, I believe the systolic pressure to be of no value whatever as a diagnostic measure in determining the degree of compression of the brain and aiding in the decision as to the advisability of an operation. These cases show conclusively that the pulse pressure is proportionately high in cases of traumatic compression of the brain and the more serious the compression the higher the pulse pressure until the last stages when vasomotor compensation begins to fail. They also prove that the pulse pressure ascends as the pulse rate descends in each case until finally the pulse pressure becomes greater than the pulse rate and when this has occurred compression has always been present. It would be folly, however, to wait deliberately for this phenomenon to occur before operating in cases where a proportionately high pulse pressure was rising and the pulse rate falling.

The choice we make in deciding whether or not a patient should be trephined must be made with a moderation of counsel and temperateness of judgment. Under such circumstances the final decision must always be formed from the study of the entire group of symptoms, but I unhesitatingly assert that of these symptoms the most important one is the frequent estimation of the pulse pressure in its relation to the pulse rate and systolic and diastolic pressures. In view of the fact that we may be called upon to treat an enormous number of head injuries during the present war and some of these will be borderline cases, it is altogether right that we should now undertake a minute study of the blood pressure findings in these injuries so that we may classify those types of injuries in which we may expect the sphygmomanometer to be of no aid whatever and those in which it will be of use.

REFERENCES.

1. CUSHING: *Keen's Surgery*, iii, 190-192.
2. CUSHING: *loc. cit.*, p. 193.
3. CRILE: *Keen's Surgery*, i, 83.

400 EAST THIRTEENTH STREET.

AN ANALYSIS OF SEVEN CASES OF FRIEDREICH'S ATAXIA.

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(Concluded from page 208.)

CASE VI.—R. M. B., age twenty-five years; single; born in the United States of Irish parents; no occupation. Careful and repeated inquiry into the family history of this case by various investigators failed to reveal any trace of this or any allied condition in any member of the family or collateral branches. One aunt was said to have had a very quarrelsome disposition. This aunt, while never admitted to a hospital for the insane, was said to have been possessed of a personality which made it impossible for any one of her relatives or friends to get along with her. Aside from this it was impossible to discover nervous or mental disease in any member of the family. The patient's complaints were inability to walk; inability to sit for any length of time in a chair without crumbling into various relaxed positions; inability to perform purposeful movements; weakness throughout the whole body; failing vision; deafness gradually increasing in the right ear; and attacks of dizziness. The duration of all these symptoms was about seventeen years. The patient had been getting gradually worse. The menstrual history was normal. The onset of this condition was sudden, beginning with a chill at the age of eight years, which came on immediately after a fall on her back which occurred while she was at play. The patient fell, was picked up trembling and unable to walk, and was carried home, where she was put to bed. She suffered from severe headaches for a number of weeks and there was no pain in the spine nor in the lower limbs. There was no vomiting at any time during the illness. After a few hours, the chill and chilliness disappeared, the headache disappearing at the end of a few weeks. She remained in bed for eight or nine months absolutely unable to move either one of her lower limbs. During this time in bed there was no difficulty with the movements of the head or arms. She is said to have been absolutely normal in every way, both mentally and physically, before the onset of this illness. At the end of eight or nine months the patient was urged to attempt to walk and great patience and care were used in reteaching her how to walk. This was attended by great difficulty because she staggered in all directions, stumbled easily, and often fell to the ground. She never regained the power of locomotion and the difficulty in walking increased until finally she was unable to walk at all. She has not walked now for fifteen years and has not been able to stand on her feet for the same time.

Weakness and the irregular movements in her arms began about twelve years ago. She began at first to fumble objects and finally was unable to hold anything in her hands, not only because of the ataxia, but also because of the actual weakness. At the same time it was noticed that her legs began to atrophy at first in the thighs and then in the calves. Atrophy and great weakness also attacked the arms and hands, beginning in the thenar and hypothenar eminences simultaneously. With the increasing atrophy in the small muscles of the hand, there followed the typical deformity known as the claw hand. In 1912 a ptosis developed in the left eyelid which persisted in some degree to this day. She has at no time during these years suffered from paresthesia or dysesthesia and had no pain except during her one attack of rheumatism. This attack of rheumatism occurred about two years ago and left her with a soft blowing systolic murmur at the apex which has now disappeared.

Her difficulty in speech began about three years ago with a sensation while talking as if her tongue was getting in the way of her words and interfering with their coming out. She was not able to correct this difficulty, although she tried hard. There never was at any time, however, a paralysis of the tongue. She had noises in the right ear with dizziness, and partial deafness developed gradually in that ear. This trouble began at the same time ataxia and inability to walk began. Examination showed that smell was normal. The fundi showed general pallor.

Pyelocystitis in Infancy and Childhood.—Henry F. Helmholtz (*Illinois Medical Journal*, November, 1917) in a bacteriological study of forty-five cases found that of nine boys eight had a colon bacillus infection; of thirty-six girls twenty-eight had colon infection. The condition is often characterized by an absence of local and the presence of general symptoms. The urine should be frequently examined in febrile attacks in infancy.

There was undoubted optic atrophy. There was a definite nystagmus of a peculiar character. It could be elicited with movements of the eyeball in all directions, but did not persist, being very rapid at first and then gradually ceasing after from fifteen to twenty movements. The oscillations were irregular and sometimes could only be elicited with movements of the eyeball in certain directions and not in others. There was some weakness of the elevator palpebrae and also some weakness of the internal rectus of the left eye. The pupils were widely dilated but reacted promptly to both light and accommodation. The reactions were equal in both pupils. There were no irregularities and the consensual reaction was present. The motor and sensory portions of the fifth gave no indication of abnormality, this being true also of the seventh nerve. There was deafness which was not absolute in the right ear, due to an old middle ear condition. All other cranial nerves were normal. The patient was unable to stand or walk or even sit upright without artificial aid. She sat in a chair limp and had to be propped up and her body tied to the chair to prevent her from falling. This complete relaxation, weakness, and loss of tone in her trunk and neck muscles caused various apparent deformities of the spine.

All the superficial and deep reflexes were very much diminished or absent. I was never able to elicit them to my satisfaction, although at times it appeared that the patellars at least were present. There was no Babinski and no clonus. There was great weakness in all muscles of the body. The calf muscles and the anterior leg group and the perineals were atrophied. There was considerable atrophy of all the muscles of both hands and forearms. The atrophy in the interossei and lumbricales and of the thenar and hypothenar eminences caused the typical claw hand deformity. The typical Friedreich's foot was present. The feet are short, highly arched, the big toe extended, the distal phalanx flexed. There was no tremor. Profound ataxia was present in both limbs, head, and tongue. Adiadochokinesis was very marked. In the arms and both hands, especially marked in the left, and in both feet, there was diminution to both pain and temperature, also to light touch and pressure. Deep sensibility was most profoundly affected in the left arm. Along the median distribution the hypesthesia was more marked than anywhere else. The hypesthesia was more marked in the hands and feet than it was in the arms and legs. There was no apparent disturbance in the sensation of the head, face, neck, and chest.

Speech was distinctly ataxic, the tone and cadence and pitch were very changeable, showing variations in the same sentence. It was extremely hard to determine whether the speech was caused entirely by the ataxia present in the muscles of phonation or whether it was caused also by an emotional change in the patient. Of late this patient had become extremely emotional, laughing or crying hysterically without apparent cause, giggling foolishly to herself, and showing a marked degree of emotional and intellectual deterioration. It seemed hardly likely that the disease process was responsible for the undoubted intellectual dulling present in view of the fact that she had no educational instruction for almost twenty years, and had, during that time, practically always been in an institution where her environment had not been of the type conducive to development.

In this patient again the relaxation of the general musculature was seen. There was a definite optic atrophy. There was an involvement of the third nerve here, the ptosis being very marked. The same stupid, silly expression of countenance was present in this patient as in the last case and was probably due to the same cause, namely, a paresis in both facial nerves. The scoliosis in this patient was apparent, due to weakness of the postural muscles. It could be eradicated by holding the patient upright by the shoulders. The contracture in both feet, which was very typically present, however, could not be changed by manipulation. It seemed to me that this scoliosis, which could be removed by mechanical correction, pointed distinctly to the weakness of the postural muscles as a causative factor in the development of the deformity of the spine. The x ray showed that there was also in this case some indication of rarefying osteitis in the long bones of both lower extremities. The blood and spinal fluid examinations were negative.

In this patient the profoundest blow dealt by the

disease process was in the direct and ventrospino-cerebellar tracts. The pyramidal tracts might seem to have escaped unless one reasoned that the destruction of the anterior columns was so profound that the stimulus applied to the deep tendon reflexes could not get through to the cortex, and therefore, the typical lack of control of reflex response, such as occurred with injury or destruction of the cortical spinal tracts, could not in this case be elicited. This was probably the case, because it is inconceivable that with the disease process eventually getting into the anterior horns and causing the profound atrophy present, the pyramidal tracts should have escaped. In other words, the reason why there was no Babinski response in this patient was probably due to the fact that the posterior columns were destroyed, and that a stimulus applied, for instance at the patellar tendon, traveled by the peripheral nerve to the posterior root ganglion and probably got very little further because the posterior horns and posterior columns were destroyed. Therefore, the stimulus could not reach the cortex, and on its efferent side, did not reach the anterior horn cell through the pyramidal tracts. Of course, it might be possible that the lower motor neuron with its cell in the anterior horn was destroyed, and that the afferent portion of the arc leading into the posterior columns was also destroyed with the pyramidal tracts intact, but the clinical evidence of this condition would be the same, that is, a diminution or absence of deep tendon reflexes and no Babinski or clonus response.

CASE VII.—R. H., age twenty-six years; born in the United States of Irish parents. Careful inquiry in this case failed to show the presence of any significant familial history. The patient complained of inability to walk or stand, difficulty in talking, and deformity of the feet. The trouble began sixteen years ago when the patient stumbled and fell, striking his head. He was not unconscious after the fall but it was soon noticed that his left ankle would give way easily when he stood or walked for any length of time. The weakness in the left foot finally became so marked that he walked with a decided limp. Soon after this, atrophy and weakness began to show itself in both hands. Then the right hand became involved and the weakness in the muscles in both legs became so marked that he could not walk without the aid of crutches. The atrophy in both hands and feet had progressed very slowly. Several years after the onset of the trouble contractures took place in the feet, resulting in equinovarus. The patient said that he remembered that he was always somewhat awkward, but he was able to play and do everything that a boy of ten usually does. His family said that he developed perfectly, both mentally and physically, until the onset of the trouble, and nothing wrong was noticed until a few days after his fall.

Physical examination showed that the sense of smell was normal and that the fundi were also normal. The pupils reacted promptly and equally to light and accommodation. The consensual reaction was present and there were no irregularities in the size or shape of the pupils. Nystagmus was present, but as in the case just cited, it was not constant in all directions and was not typically rhythmic. All cranial nerves were normal. The patient was not able to stand or walk. There was no deformity of the spine and the patient was able to sit up perfectly. Motor power was diminished in both hands and feet. There was atrophy in the calf muscles and the muscles of the leg anteriorly; also distinct atrophy in the thenar and hypothenar eminences and in the fourth interosseus of the right hand and the first and third of the left hand. There was a generalized motorfacient tremor, almost intentional in type, in all four limbs and sometimes even in the body when any special

effort was made. There was distinct ataxia in both arms, not quite so marked in the legs. A possible reason for this was that this patient had practised the movements of putting on and taking off his shoes, stockings, and braces in the dark. He was in a ward where early rising was the rule, breakfast being served at 5 o'clock in the morning. The attendants in the ward assured me that he had been much more awkward in all his movements than he now was, despite the fact that there was more actual muscle weakness. There was no change of tone and there were no irregular, involuntary movements. Adiadochokinesis was marked in both hands. There was distinct hyperesthesia to pain, heat, and cold in all parts of the body, except the legs and face. Position sense was also affected somewhat, but only in the feet and toes. All other sensations, including vibration, were normal, after careful testing. All superficial and deep reflexes were active, the patellars particularly so. Clonus was hard to elicit because of the deformity and contractures, but was surely present. There was a Babinski present on both sides. The speech was slow, halting, uneven, and distinctly ataxic. The typical deformity of the feet was present in this patient and was exactly like the one in the preceding patient, except that equinovarus was added. This patient at various times had had trophic disturbances in his feet, and the skin had broken down several times, causing ulcers, which, however, were easily healed up. The x ray and blood examinations in this case were negative. Spinal fluid examination showed nothing on repeated examination, even after provocative salvarsan injections.

In this patient the outstanding feature was the distinct involvement of the pyramidal tracts and the cerebellar type of the tremor present, which was closely related to the intention type seen in multiple sclerosis. In fact, the tremor was distinctly an intention tremor and possessed the same widely, irregular, motorfacient characteristics. The tremor spread very rapidly, especially under stress or great exertion, to practically the whole body. As evidence that the pyramidal tracts were involved extensively, the early contracture was rather suggestive; also the very active patellars and Achilles reflexes, the presence of clonus, and the distinct Babinski and Chaddock. Another evidence of the deep involvement of the pyramidal tracts in this case was the tremor. It will be remembered that the rubrospinal tracts are deeply imbedded in the upper central part of the pyramids in numerous bundles. The disease process, therefore, could not conceivably have picked out the rubrospinal bundles to the exclusion of the including pyramidal fibres. The rubrospinals were responsible for the tremor in this case without doubt. The posterior columns and the lateral spinohalamics were also involved with both spinocerebellars. The spinohalamics are mentioned for the first time in the discussion of any of these cases because in this case we had distinct disturbance which was extremely marked to both heat and cold in all parts of the body, except the face and legs. In both legs there was a diminution to heat and cold, probably due to the fact that there was considerable scar tissue present from the old trophic ulcers which had healed. There is no reason to exclude this case from the symptom complex known as Friedreich's ataxia, simply because of the prominence of the sensory and pyramidal tract symptoms. Anatomically, there is no reason why these tracts should not be involved in this kind of a process.

An analysis of these cases shows that there is a distinct familial history in only two out of the six cases. Careful inquiries were made in each of the

other four cases with negative results regarding this point. Inquiries were made also regarding the employment of the parents of these patients and it was found that there was only one lead worker and he was the father of the two children. This man worked as an electrotypist and handled lead but very little, and has never been ill with any set of symptoms which might point to lead as a cause. In the histories of R. H., F. D., R. M. B., and E. B., there is a distinct traumatic history and the onset of the symptoms seems to be definitely laid at the door of the injury. If we take the brother of the patient F. D. as an added case, we can see here also a distinctly traumatic influence. Serious attention should be paid to this point in a consideration of the development of the trouble in these cases. It might easily be that an arrest of development or even irritative and degenerative processes might follow an injury, either direct or indirect, to the spinal column and its contained cord.

The nystagmus has already been discussed and our conception is that it is an expression of the weakness and loss of muscle sense existing in the muscles of the eye. The nystagmus is very peculiar; it is not at all rhythmic; it is not constant and can usually be brought out only by movements of the eyes in various directions, and in most of these cases will persist for only several minutes or less, although in two patients, F. D. and R. M. B. both old cases, the nystagmus was constant. Strangely enough, both of these patients also exhibited some slight degree of optic atrophy, or at least a pathological pallor of the disc. Vision in both of these patients was very much diminished, but no central scotoma was made out. Scoliosis was present in varying degrees in each of these cases, being mildest in the case of E. B. The onset in every one of these patients, excepting F. D., seems definitely to have been between the ages of eight and twelve years. R. H. was about ten years of age; E. B. about twelve; J. B. about eleven; F. D. about twenty-one; R. M. B. about eight; R. C. was undoubtedly a full fledged case when eight or nine years of age; and the boy T. B. was nine years of age when the diagnosis was made. In connection with this it is peculiarly interesting to note that the patient F. D. had a brother who undoubtedly died from the same illness, having acquired it when he was about nineteen years of age, also peculiarly enough, after an injury. Typical speech defects of an ataxic type were found in the three most advanced cases and were not so markedly, but definitely present in the least advanced case, namely that of the boy, J. B.

A résumé of the characteristics of this disease would enable us to define it as a disease of the spinal cord, not limited to any particular tract or set of tracts occurring usually between the ages of eight and twelve years, quite commonly after an injury, and characterized by ataxia; scoliosis; typical deformities of the feet and big toes; great muscular weakness; atrophy and changes in sensation; diminution or absence of reflexes, more often the deep reflexes than the superficial reflexes. Besides this, as evidence of the involvement of the pyramidal tracts, there is quite characteristically present a

Babinski response, also quite constantly a peculiar atypical inconstant series of movements in the eyeball, called nystagmoid, for want of a better name. It would appear that atrophies occur only after a long time and that the pyramidal tract signs are also late, the first signs usually being ataxia and muscular weakness, as an expression of which deformities usually occur in the feet and in the spine. The tracts of the spinal cord usually involved, first therefore, would appear to be the spinocerebellar tracts, but eventually very little, if any, of the spinal cord is left free from involvement.

Four of these patients were observed at the Vanderbilt Clinic and I am indebted to Professor Tilney, of the Neurological Department of Columbia University, for permission to use this material. The other three patients were on our service at the Kings County Hospital and I am indebted to Doctor Brush for the liberty of presenting these cases.

270 WEST EIGHTY-NINTH STREET.

OBSTETRIC MEMORANDA.

The Toxemia of Pregnancy. Comments on Ectopic Gestation. Differentiation of the High from the Medium Forceps Application.

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THE TOXEMIA OF PREGNANCY.

My theme deals specifically with the fulminant type of toxemia. Like a bolt from the blue, the woman passes from health into coma and thence, ordinarily, into the hereafter. No obstetric complication is more paralyzing to the physician, more distressing to the friends. Practically, danger signals do not offer. The urine may be normal in quantity, in urea percentage, and in microscopic constituents. Slight headache, slight dimming of vision may offer as symptoms. Edema is absent. As examples, I quote in brief the following instances seen by me during the forty years I have practised the obstetric art and up to the present, unrecorded:

CASE I.—This patient was a primipara, aged twenty-four years, the wife of a physician. Her urine had been examined by two experts independently twenty hours before the attack and pronounced normal. In the afternoon she sat for a few hours in Central Park and at dinner time was her customary cheery self. About 10 p. m. her husband phoned me that she was complaining of headache. I ordered a hot bath and a laxative pill. At 11 p. m. I was phoned that she had had a convulsion. I reached her bedside within one half hour and administered 0.5 grain morphine hypodermically. The late Dr. Robert H. Murray and Dr. Henry C. Coe responded to my call for aid. Her pulse being full and bounding, we bled her to the extent of thirty-two ounces and placed four drops of Croton oil on her tongue. Meantime, I began dilatation of the cervix and within two hours had emptied the uterus of a two and a half months sac. Her bowels moved freely and continuous high saline hot irrigation of the intestine was instituted. There were transient convulsions for thirty-six hours. The late Dr. W. T. Lusk was added to the counsel. Notwithstanding all our efforts, the woman died forty-two hours after the initial convulsion.

CASE II.—An actress of international reputation was delivered by me for the late Dr. T. H. Robertson, and three years afterward entered into her second pregnancy in charge of the late Dr. Robert Watts. Her career on the stage kept her in the West up to the seventh month of gestation and neither Doctor Watts nor I was able to

certify to the condition of her kidneys. Her husband reported her general health as excellent and the charm of her presence and spirits as usual. Ten hours after reaching this city, she had a convulsion and passed into coma. Doctor Watts gave her a half grain of morphine hypodermically and sent for me. A specimen of urine obtained by catheter was examined by the late Dr. Willson Brown. It contained a trace of albumin, normal urea percentage, and a few granular and hyaline casts. Dr. W. T. Lusk responded to our call and agreed with us that the uterus should be emptied. The cervix was soft and I was able by the hand to dilate and to deliver. The child lived two hours, and the mother died within twenty hours.

CASE III.—A multipara, the wife of a physician, all her menstrual life had suffered from migraine and therefore the intercurrent of an attack at the eighth and one half month of gestation did not alarm her husband nor the physician in attendance. This was the sole symptom of impending toxemia. At about 2 a. m. she had a convulsion and passed into coma. I was summoned and reached the house within one half hour to be told at the door that the woman had just expired. I rushed upstairs, secured the husband's consent, and performed Cesarean section with a pocket knife, delivering twins, one of whom gasped for a few minutes.

CASE IV.—A multipara in the eighth month of gestation. Beyond transient edema the pregnancy had been normal in every respect. Suddenly the edema increased. Twenty-five per cent. albumin appeared in the urine, the urea percentage diminished to one per cent., and casts of every variety were determined microscopically. I was sent for and found the most aggravated case of general edema I had ever seen. The pulse was full and bounding. I bled her freely, placed four drops of Croton oil on the tongue, and commenced manual dilatation of the cervix. Within one hour and a half I delivered the woman by version of a 15½ pound living child. The woman emerged from the chloroform anesthesia to pass into convulsion after convulsion. These yielded to large doses of morphine. The woman recovered, although an intercurrent attack of pneumonia nearly cost her her life.

In this instance, toxemia was, as it were, anticipated through the active emptying of the uterus.

The moral to be drawn from these cases may be summarized as follows: Although in certain instances we are absolutely powerless to determine the impending toxemia, the watchful care which every physician of the conscientious and not the mercenary type should give his patient may result in the revelation of danger signals which will demand the immediate emptying of the uterus *lege artis*. This is the only method suitable to cases of this type. I have been preaching this doctrine for nearly forty years and now I see no reason for changing my mind.

ECTOPIC GESTATION.

One of the triumphs of American surgery is the fact that supplementing the teachings of Lawson Tait, of Birmingham, England, the present treatment of this malignant disease was established. My first experience with ectopic gestation was at the time when the electrotherapeutic craze predominated. I was present when the late Dr. T. Gaillard Thomas and the late Dr. Paul F. Munde, master diagnostician, electrified a supposed case of ectopic gestation. The woman promptly collapsed and it fell to my lot to remain at her bedside for thirty-six hours when she rallied. This case should have warned me but the leaders in gynecology of the day taught me to pin my faith to this new treatment. Within a few months Dr. W. J. Burnett, of Long Island City, and I reached the diagnosis of ectopic in a patient of his. I galvanized her. She collapsed

and only rallied after hours of anxiety. The collapse in both these cases was undoubtedly due to rupture. Possibly this accident was imminent when the galvanic current was applied. Whatever the cause, I determined then and there to find other therapeutic means and the teaching of Doctor Tait took root. Two years later I saw this woman with Doctor Barnett, concurred in his diagnosis of ectopic, had her removed to the French Hospital, where I was attending surgeon, and opened her abdomen. The left tube had ruptured. The right, the site of the previous ectopic, had shrivelled to a thin filament. I removed both tubes and the woman recovered. Thereafter it has been my rule to operate in cases of this sort at once whether the subject is in so called shock or not. To aid diagnosis I have repeatedly called attention to the value of a posterior vaginal section. In a series of over 100 ectopics where a timely elective operation has been possible, the mortality rate is nil. The deferred cases, or as I term them, "cold storage" cases, in which hesitancy rules instead of the bold surgery that characterizes the men who know from ample experience, are ones that carry a mortality rate. On the immature surgeon, the quickly made surgeon, rests the onus of a mortality rate consequent upon hesitant therapeutics, where bold surgical therapeutics insures uniform recovery.

DIFFERENTIATION OF THE HIGH FROM THE MEDIAN FORCEPS APPLICATION.

The term "high forceps" is applicable alone to instances where the fetal head is floating above the brim. The term "median forceps" is applicable to instances where the head has engaged or has entered the superior strait. In the first instance under normal pelvic capacity an alternate operation offers, i. e., version; in the second instance, failing delivery by the forceps, the alternate operation is the Cæsarean, for, be it understood, modern obstetrics frowns on perforation and cranioclasty of the living child, irrespective of religious belief and dogma. These are the views formulated by me as I review my experience in over 6,000 cases of labor seen as a student in some of the leading hospitals of Europe and as a practitioner in private practice, at the New York Maternity and at the New York Infant Asylum. I am well aware that these views are not shared by many teachers of far greater repute, but each man, if he practises with his eyes open, at last formulates opinions which serve as his compass, even though his colleagues of high repute differ from him. High forceps, that is today, forceps applied to the floating head, must be looked upon as the most major of all the obstetric operations and such practice can alone be defended on ignorance of a very culpable, well nigh actionable nature. In my estimate of the place in obstetrics occupied by the high and median forceps, version and the Cæsarean section, I purposely discard symphysiotomy and pubiotomy, for the reason that the former after lying dead for many years was resurrected only to be buried again by unanimous consent, and, let us hope, so deep that not even Gabriel's trump can waken it. The latter, pubiotomy, is unsurgical in principle and damnable in practice. While obstetrical data supplied by a few would seem to justify the ac-

ceptance of pubiotomy the sum total of experience relegating it to the outer darkness where I, for one, trust it may rot forever.

One of the curiosities of obstetric practice is, to me, the fact that today, after the lapse of nearly forty years, the profession almost as a unit is ignorant of the value in cases of high application of the axis traction forceps. As a student under Tarnier at the Maternité in Paris, I became convinced as long ago as 1879 that the man who would practise obstetrics well and scientifically must be the owner of the axis traction instrument. And yet not many years ago I could count on the fingers of one hand the men who possessed the instrument and, having it, knew how and when to use it. With no uncertain voice, I have for years entered my plea for the instrument and once more I ask the profession to study the sphere of its applicability. The instrument is cumbersome and costly, true enough, but these are not valid reasons for not owning it. Applied *lege artis* to the head just engaged, followed by intermittent traction, allowing the head to mould slowly—and, by the way, attempts at forcible moulding are criminal—this instrument will save many an infant otherwise doomed and will render unnecessary resort to many a Cæsarean section. Such, at least, is the mature opinion of one of the older teachers of the obstetric art.

200 WEST FIFTY-EIGHTH STREET.

Studies on Acidosis.—J. L. Whitney (*Archives of Internal Medicine*, December, 1917) notes that the great majority of the cases studied by him, comprising a variety of clinical conditions, showed a more or less pronounced acidosis at the time of death. In many of them it was of such a degree that it may well have been the lethal factor. The results obtained are held to bear out to some extent the theories of Henderson and Fischer as to shock. Infection seemed to have a very marked influence in causing acidosis, all but one case in the series with acidosis showing evidence of severe infection, while the cases without acidosis did not have infection. It was observed, however, that a patient may have marked infection with intoxication and yet show no acidosis provided his powers of elimination are active. Certain toxemias are not necessarily accompanied by acidosis, viz., those of intestinal obstruction, Eck fistula, malignant tumors, and pernicious anemia. Two cases of pyloric stenosis with tetany showed, instead, an alkalosis. Certain heart cases, even, though severe, showed lack of acidosis or an actual increase in blood carbonates, but just before death they, too, were found likely to show some acidosis. Study of nephritis cases seemed to show that two factors are necessary to produce acidosis, viz., failure of the power of elimination and an increase of acid production in the body. Cases with a two hour phenolsulphonphthalein output of over thirty per cent. showed acidosis only in the presence of a severe toxemia, whereas cases with an output below thirty per cent. showed acidosis as a rule. The increase of acid production in nephritis is ascribed to the toxemia of the active parenchymatous form of the disease; infection is also recognized as an even more powerful cause.

Our Readers' Monthly Prize Discussions

Twenty-five Dollars Is Awarded for the Most Satisfactory Paper

All persons, whether subscribers or not, are invited to compete for the prize of \$25 offered for the reply deemed best by the editors to the following questions:

CXC.—How do you treat burns? (Closed.)

CXCI.—How do you treat lobar pneumonia? (Answers due not later than February 15th.)

CXCII.—How do you treat whooping cough? (Answers due not later than March 15th.)

The award will be based solely on the value of the information contained in the answer. No importance will be attached to literary style. Answers should preferably contain not more than six hundred words, and should be written on one side of the paper only. All papers submitted become the property of the JOURNAL, and should bear the full name and address of the author for publication. The prize will not be awarded to the same person more than once within a year.

The prize of \$25 for the best answer to Question CLXXXIX has been awarded to Dr. John E. Kaons, of Chicago, whose paper appeared on page 211.

PRIZE QUESTION NO. CLXXXIX.

TREATMENT OF FAINTING.

(Concluded from page 213.)

Dr. J. Otis Carrington, of New Brunswick, N. J., writes:

Among the conditions causing fainting may be mentioned vitiated air; uncontrolled emotions such as fear, joy, anger, grief; compression of the heart by tight lacing and diseased conditions; excessive natural and artificial heat; reflex causes from the effects of irritant or intestinal poisons, scybala, or worms; hemorrhage; certain blood diseases, like chronic anemia and chlorosis. Hunger, starvation, shock, excessive pain, or cerebral injuries may cause it. Another important cause is cardiac complications, especially fatty degeneration of the heart. Certain drugs, physical exhaustion, hysteria, eyestrain, and indigestion also contribute to the etiology.

Treatment of this condition involves removal of the cause and restoration of the action of the heart. Place the patient flat on his back with all constrictions about the neck and body removed. Look for false teeth and, if present, remove them at once. Allow abundant fresh air by opening windows or removal to out of doors. Alcoholic frictions to the forehead, temples, and wrists should be applied. If hemorrhage is causative, check it by appropriate measures, reassure the patient when restored to consciousness, and confine him to a darkened quiet room with sufficient fresh air. Stimulate the heart with half ounce doses of brandy, whiskey, strong wine, or, better still, dram doses of aromatic spirit of ammonia, and dash cold water over the face and chest. Inhalations of amyl nitrite are valuable in reviving anemics. Frequently, a hypodermic injection of atropine sulphate, 0.01 to 1/60 grain, is good. Oil of cinnamon in one or two minim doses is another good stimulant. When the syncope is cardiac in origin, tincture of nux vomica in five minim doses gives results. When available, the electric brush, swept over the abdomen and chest, is helpful. In administering stimulants by mouth, care should be taken to note if the patient can swallow. If he cannot, give them hypodermically in an appropriate dose. Inhalations of weak ammonia water or smelling salts help but care should be taken not

to place strong irritants too close to the nares of an unconscious person. Along with the treatment recommended, employ artificial respiration. Having revived the patient, treat the underlying cause.

Dr. Louis Nagorsky, of New York, says:

The treatment of fainting depends more or less on the cause. When one is called upon to treat a person who has fainted, he cannot temporize in order to find out the etiology. One must act promptly, and revive the unconscious person. It has been the writer's practice always to carry amyl nitrite pearls in his bag. A pearl crushed in a handkerchief and applied to the patient's nostrils invariably brings about the desired effect. If amyl nitrite pearls are unobtainable, another method, just as reliable and efficacious, is to place a tablet of nitroglycerin, 1/75 to 0.01 grain, under the patient's tongue, where, on account of the rich venous plexus present, it is very promptly absorbed. It has been proved that the reaction is nearly as rapid as when given hypodermically. The hypodermic injection of strychnine sulphate, 0.02 grain, will also answer the purpose. Usually placing the patient in the supine position, elevating the feet, and loosening the collar, together with dashing cold water on the face and chest, will resuscitate him. Many people who have an attack of syncope, recover as soon as they fall to the floor. If the patient, who has been in a sitting posture while undergoing treatment for some ailment, should feel as if he was going to faint, or even in the act of fainting, his head should be lowered and with his hands resting on the floor, his collar loosened and left in this position until he revives.

It has been stated that friction on the lower cervical nerves, by digital manipulations, brings about speedy recovery. Where the fainting has been caused by impure air, this condition should immediately be remedied. Fainting due to changes in the blood pressure should be treated by suitable drugs. For vasoconstriction, vasodilators are indicated. Syncope due to autointoxication of intestinal origin calls for more than resuscitating measures; it should be followed up with a colonic irrigation of tepid water, to which is added spirits of turpentine, one dram, and sodium chloride, two drams, to the quart of water. As turpentine is an irritant to the kidneys, it is wise to learn if the patient is a nephritic.

Dr. Louis Newwelt, of New York, contributes:

Fainting is the reflex inhibition of the cardiac and respiratory centres, resulting in cerebral anemia following a suddenly lowered arterial blood pressure. It may be caused by any condition which decreases either the amount or the nutritive qualities of the blood reaching the cerebral vessels. The causes may be grouped as, 1, psychical, or emotional, as the sight of blood from hematemesis, hemoptysis, menorrhagia, or external wound, also fear or sudden joy or grief; 2, cerebral, from anemia of the brain, especially when abruptly produced in anemic persons or in those suffering with failure of the power of the heart, as by suddenly rising from the recumbent position; 3, traumatic, as sudden blows on the solar plexus, dragging upon or rough handling of the visceral mesentery during operations, dilatation of the sphincter ani, and operations in the region of the superior laryngeal nerve; 4, unwholesome atmospheric conditions as found in crowded hot quarters; 5, syncope may occur during incomplete operative anesthesia, in which condition the cerebral centres are inhibited by the operative stimulus, as in dilatation of the sphincter ani. Sitting positions under anesthesia should be avoided because these may cause cerebral anemia, or else the patient should be watched carefully, and at the first signs of fainting the position must be changed to a reclining posture.

The prophylactic treatment consists of avoiding the etiological factors of fainting as mentioned above. The treatment of the attack of fainting is the same no matter what the cause. If the patient is in the sitting position, the head should be held down between his knees, or better still, he should be put in the reclining position with the head lower than the rest of the body. All clothing should be loosened. Cold compresses to the face and heat or counterirritation to the epigastrium may be applied. Usually these measures will suffice, as the patient recovers consciousness in a few seconds. If recovery does not soon occur, and the heart action becomes more irregular and weaker, the cautious inhalation of the fumes of aqua ammoniac or of the usual smelling salts is advisable. If any further action becomes necessary, a hypodermic injection of strychnine sulphate, 1/30 grain, and atropine sulphate, 0.04 grain should be given.

In the fainting of psychic origin, an alcoholic drink as whiskey or brandy, one half ounce, will prove of value. Syncope during anesthesia calls for rhythmic pressure over the heart and artificial respiration. Stimulation is absolutely contraindicated in syncope resulting from hemorrhage, unless life itself is threatened, as in this condition the fainting is Nature's own conservative method of stopping hemorrhage. Inhalation of the fumes of amyl nitrite, three minims, on a handkerchief, is of considerable value, especially in pulmonary hemorrhage. In the syncope from cardiac valvular disease, myocarditis, or cardiac dilatation, stimulation with camphor, one grain, in fifteen minims of sterile oil hypodermically should be used; strychnine or digitalis is also indicated as hypodermic injections. In the fainting from functional neuroses of the heart,

the vasodilators, as nitroglycerin or erythrol tetranitrate, are often of distinct value.

Dr. H. T. Pessar, of New York, says:

While fainting is in reality a symptom and not a disease, it deserves detailed consideration because of its frequent occurrence and its dependence upon definite functional or organic pathology. Fainting seldom occurs except as an expression of a disturbed cerebral circulation caused by some functional or organic lesion in the pulmonary, cardiovascular, vasomotor, or nervous systems. Therefore, in considering the causes of fainting it is always necessary to take into consideration the state of the cardiovascular, pulmonary, and nervous systems.

In the treatment of fainting no time should be lost by the attending physician, especially when the patient tends to syncope. The objective point is to cause immediate improvement of the cerebral circulation, and to revive the heart's action as speedily as possible. For this nothing is better than hot water bottles applied to the precordial region. Equally important is postural treatment and it is absolutely essential to have the patient in a horizontal position in order to determine a better flow of blood to the brain. In some cases it is best to raise the lower extremities and depress the head in order to permit the bloodless brain to receive an adequate supply of blood. Tight bandaging of the extremities for the purpose of emptying the blood and forcing it into the brain has been tried with success. All mechanical obstruction about the patient's body, such as close fitting dresses, corsets, etc., should be removed or loosened. At the same time it becomes necessary to stimulate cardiac and respiratory functions.

Externally, cold water is to be dashed upon the face and the body flapped with towels dipped in cold water. Mustard plasters are applied to the region of the heart or upon various portions of the chest and back, shifting from one spot to another. Ammonia or spirits of camphor may be advantageously applied to the nostrils. In cases showing a tendency to persist, the skin is stimulated by applying a faradic current to the sides of the chest and precordial region. Internally, coffee, alcohol, or ether are of decided benefit. Champagne is an efficient remedy. Repeated hypodermic injections of ether in doses varying from ten to thirty drops are efficacious in reviving a flagging heart. Oil of camphor can be used in the same manner and for the same purpose. Hoffman's anodyne in teaspoonful doses and ten to twenty drops of ether on a lump of sugar are also advised. When life appears to be threatened we should not hesitate to resort to transfusion of normal saline solution.

An acute attack of fainting being frequently only a symptom of some chronic disorder, it becomes imperative to search for the cause and apply the remedy. A blood examination is to be made in every instance. The nervousness often accompanying fainting requires perfect rest in bed, good food and ferrous tonics. Anything which tends to excite emotion should be avoided. A Weir-Mitchel rest cure in all its details will here find a most fertile

field for useful application. Systematic gymnastic exercise is beneficial.

Dr. George H. Hess, of Uniontown, Pa., states:

Fainting is a mild, temporary form of shock due to some vasomotor derangement. The cause, whatever it might be, produces a dilatation of the splanchnic area of bloodvessels, causing thereby brain anemia from the drainage of blood into these larger vessels. Nature tries to equalize the distribution of the quantity and pressure of the blood by causing the individual to assume the horizontal position, that is, by falling; consequently the first step in the proper treatment of this condition is to place the patient in the reclining posture or even to elevate the buttocks so that the brain may be supplied by an extra amount of blood by gravity. One of the subjective symptoms of this condition is sighing respirations, caused by the faulty circulation; therefore fresh air is an essential to the treatment. This may be secured by the raising of windows, if inside, or, if in a public place, by restraining the crowd from forming in dense groups about the individual. All constricting bands about the throat and chest should be loosed, so that normal respirations will not be interfered with. These patients, because of the dilatation of the peripheral bloodvessels are covered with cold, clammy perspiration similar to that seen in shock; this means that external heat is indicated. This may be done by hot water bottles, if such are handy; if not, several fruit jars filled with hot water will act very well or bricks may be heated and applied about the patient; care should be taken that the patient is protected from burning by the heating appliance. These appliances should be placed along either side and at the extremities and should be augmented by additional covering such as blankets, overcoats, or anything that will prevent the dissipation of body heat.

The indications in the way of medication are for drugs that will act quickly by stimulating the vasoconstrictors either centrally or peripherally and also maintaining the heart's action. As the condition is usually of short duration we can use those drugs which will give the greatest amount of stimulation in the shortest amount of time and which are fugacious in action.

Cold, being a tonic to the vasomotor system when locally applied, can be utilized by bathing the face with cold water. Ammonia, acting by its stimulating action upon the heart and vasomotor centre, may be given by inhalations or by mouth in the form of the aromatic spirits, one dram, or aqua ammonia ten to twenty minims, well diluted with water. Camphor, one of the best fugacious heart stimulants, may be given by inhalations or hypodermically in sterile olive oil, three to six grains. The majority of cases will respond promptly to this medication, if, for cause, the condition is of a more serious nature and consequently requiring more stable medication to carry the stimulation for a longer duration, the more stable drugs must be administered.

Strychnine sulphate may be given hypodermically, grain 1/30. Atropine sulphate, a powerful heart and respiratory stimulant as well as a stimulant to

the vasomotor centre, may be given in place of strychnine, 0.01 grain, or in conjunction with it in reduced dosage, 0.005 grain hypodermically. Caffeine is another powerful heart stimulant and may be given, if the patient can swallow, in the form of black coffee or hypodermically in the form of caffeine and sodium benzoate, one to two grains. Alcohol is contraindicated here, as in all forms of shock.

Following the return of color, the increase in volume of the pulse, and the return to consciousness, the cause, if possible, must be removed; that is, the exciting cause, such as a deranged gastrointestinal tract; gruesome sights; nauseating odors; pain, especially that of head, pelvic organs, testes, or gastric region; middle ear disease; beginning infections; nose and throat diseases; sinusitis, and last but by no way the least troublesome, the hysterical form. After regaining consciousness and proper circulation, the patients in the great majority of cases feel no worse for their experience excepting perhaps a slight headache and feeling of exhaustion.

Dr. Isadore Josephson, of New York, writes:

In the emergency case the physician will find the patient stretched on the floor or a couch surrounded by a group of well meaning friends, one slapping him, the other pouring water over his face, one loosening his neck band, another with a bottle of aromatic spirits of ammonia or smelling salts. The physician will endeavor to ascertain the cause and will institute treatment accordingly. The symptoms of anemia and asthenia will present themselves.

The mistake most often made by the physician, especially the young practitioner, when confronted by a case of syncope is to administer a stimulant hypodermically. The hypodermic syringe is the first thing the young practitioner thinks of, for he is doing something and it makes a good impression on onlookers, so strychnine, the favorite, is used, or digalen, digitalin, etc. These may be absolutely contraindicated and in some cases it only adds another poison to a probably already poisoned system. Morphine in small doses may be used if the syncope is due to hemorrhage, for it tends to lessen the hemorrhage by quieting the circulatory system. Without any hemorrhage, with the patient in severe pains, with a threatened fainting spell, even morphine should be withheld until the cause is ascertained, for there may be internal injuries and the morphine masks the symptoms. The physician must not lose his head when confronted with a case of fainting due to hemorrhage, as he is sometimes tempted with a feeble pulse to administer a cardiac stimulant, for by stimulating the circulation the hemorrhage is increased.

The safest course to steer when confronted by a case of syncope of unknown origin, is to do nothing, which is better than rushing helter skelter into this and that remedy. This can be understood in the layman but is unjustified in the physician, for his training enables him to ascertain the cause which should be his main object. When he has arrived at the cause of the fainting spell he will know what to do.

Dr. W. R. Suber, of Milford, N. Y., makes the following contribution:

The treatment of fainting may be divided into two parts, the mechanical and the medicinal. The first thing to do is to place the patient in a recumbent position and elevate the extremities. Remove the cause, if possible, restore the heart's action, give the patient plenty of fresh air, and loosen tight clothing about the neck and waist, keeping bystanders from crowding around. If this fails, rubbing, bathing, and artificial respiration by Sylvester's method, should be resorted to. Hot mustard plaster may be applied over the heart. Hot effusions to the head are useful and if the condition still persists, heat then cold should be applied to the face, head, and spine. Percussion of the chest may be tried with hands or the end of a towel dipped in cold water. Vigorous centripetal friction and rhythmic traction of the tongue may be practised. Transfusion of blood or saline solution may be performed and if necessary the battery may be used in the region of the heart.

As medicinal measures the drug the most used for fainting is the aromatic spirits of ammonia given in teaspoonful doses or less if necessary. Brandy may be given straight or in water. If the patient cannot swallow it may be given as an enema with warm water or employed hypodermically, which will give the best and quickest results. Strong smelling salts of carbonate of ammonia are effective. In cases of pressure ether may be given hypodermically in doses of fifteen to thirty-nine minims. Nitroglycerin, 0.005 to 0.02 grain, will increase the flow of blood to the brain. The carbonate of ammonia in doses of five to ten grains has been given with good results.

Fainting due to hysteria will respond to Hoffman's anodyne and the tincture of digitalis, twenty to thirty drops, is very useful in some of these cases; the bromides also are largely employed.

Dr. Leonard B. Fauquier, of Jersey City, asserts:

Fainting or cerebral anemia is usually due to a vasodilatation of the splanchnic area, but one should be alert for other and more serious factors. Render such aid as will restore the vital centres to their normal activity, reestablish consciousness, and give subsequent attention to the etiological factors concerned.

The head should be lowered a foot or more below the level of the body and maintained so for a few minutes. This tends to relieve the cerebral anemia and may be sufficient. If no response follows the medullary centres should be stimulated reflexly. This can be done by application of cold water to the face, or inhalation of some irritant as the ammonia compounds. With advent of consciousness, and only then, the aromatic spirits may be given by mouth, one to two drams in water. Ether inhalations are inferior in action to ammonia, and their prolonged use is contraindicated here. Inhalations of camphor are not as strong as ammonia; they can be given by subcutaneous injection, ten drops of a ten to twenty per cent. solution in ether or cottonseed and olive oil. Patient should receive 0.3 gram of camphor. sodii benzoatis. For a stimulant of more permanent effect I have found hypodermic injections of ergotin

Inhalations of strong solutions of alcohol are not superior to ammonia; they can be given by mouth as whiskey or brandy in water when partial consciousness is attained. If no response is in evidence and diagnosis is clear other potent and more reliable remedies should be used alone or in combination. Strychnine sulphate hypodermically has a beneficial effect on the nervous system and indirectly the circulatory apparatus. Dose should be 0.004 to 0.006 grain. Adrenalin is best given by intramuscular injection. Give one c. c. of a 1:1,000 solution. The blood pressure is increased, the heart is slowed by vagus stimulation, and fills more completely and more arterial blood is given to the cerebrum. The heart condition should be known. If cardiac pathology exists and the patient is in poor condition injection into the heart muscle often acts as a direct cardiac stimulant and tonic. Where intestinal paresis is present one c. c. of pituitrin hypodermically is valuable. Having revived the patient a careful history should be taken and physical examination made. Where patient is subject to fainting and is undergoing surgical treatment, the head of table should be lowered and in urgent cases the legs bandaged or a pneumatic suit may be worn, to support the splanchnic circulation. In hysteria the tincture of valerian in one dram dose may be used. Where emotion is concerned the following is useful:

℞ Strychninæ sulphatis, gr. $\frac{2}{5}$;
Cinchoninæ sulphatis, gr. xxiv;
Acidi hydrochlorici diluti, \mathfrak{ss} ;
Syrupi rubi idæi, q. s. ad, \mathfrak{ss} iii.
M. Sig.: \mathfrak{ss} in aquæ $\frac{1}{2}$ hora a. c. t. i. d.

Dr. Max Schultz, of Brooklyn, N. Y., says:

Treatment in fainting aims to return sufficient blood to the medullary vital centres. It consists of two measures—physical methods and stimulation by drugs. Of the physical measures posture to enlist gravity in bringing the blood back to vital centres is important. The head should be kept low or lower than the feet. Other physical measures depending upon the severity of the case consist of bandaging the extremities, massage of the heart, and artificial respiration. The pulmotor and oxygen tank have a place also in the treatment at times. As regards drug stimulation, if the patient can swallow, give him brandy. If he is unconscious and the heart action is poor give a rapidly diffusible stimulant as camphor and ether, camphor and oil, or caffeine very valuable. Clinical experiments showed me some time ago that strychnine fell far short of expectations as a vascular stimulant, so now I rely more on ergotin. If the condition is associated with shock, use hypodermics of adrenalin chloride. However, the latest reports on the study of shock show that the best treatment is artificial respiration and inhalation of oxygen with a little CO₂ to stimulate the respiratory centres to greater activity. Depending on the case, you can employ coffee, enemata, hypodermoclysis, venous infusion, and even electric stimulation. Such conditions as chloroform syncope require all our resources to bring back the patients to normal consciousness. Fainting should, therefore, not be regarded lightly and each case should be individualized and treated according to its etiology and symptoms.

Medicine and Surgery in the Army and Navy

SURGICAL WORK AT A CASUALTY CLEARING STATION, OR EVACUATION HOSPITAL.

A General Outline of Work During Severe Fighting.

By H. M. W. GRAY, C. B.,

Aberdeen, Scotland,

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In giving this description, the writer deals with conditions which prevail during severe fighting. During quiet times the work of the unit should be conducted on identical lines, so that in the active periods simply a speeding up or augmentation takes place.

As in more advanced units, so also in casualty clearing stations, professional instincts and desires cannot be satisfied as one should wish, owing to many considerations connected with the military situation. It has become generally accepted, however, that the casualty clearing station is the "site of election" for operations on men wounded in the fighting line. Only operations of extreme urgency, such as for the control of severe hemorrhage, should be undertaken at stations further forward, owing to the impossibility of providing the equipment necessary for success. The value of pre-inflammatory operations is incalculable and the importance of the surgical work at casualty clearing stations cannot be overestimated. The amount which has to be done during severe fighting is sometimes very great and can only be gauged approximately beforehand. The quality of the work is controllable. The most skilful and experienced surgeons should be available in sufficient numbers to cope efficiently with the probable amount of work. Operations which are done must be thorough. Timid half measures too often prove valueless in saving life or limb or result in repeated later operations which can usually be prevented by more radical treatment in the first instance. Radical conservative measures are being attended with increasing success. Experience has shown to many operators that limbs can now be saved, such as a limb with a wound of the knee joint or in gas gangrene affecting one muscle or a group of muscles only. Modern methods of resuscitation, also, have coaxed many patients out of profound shock, while subsequent operation has snatched them from what looked like certain death. In view of these considerations, the casualty clearing station is without doubt the hospital unit which surgically is of the greatest value to the nation from both a military and civil point of view.

It is necessary therefore that casualty clearing stations should be equipped with every facility for carrying out surgical work rapidly and efficiently. All possible aids to diagnosis and treatment such as are furnished, for example, by up to date x ray and bacteriological laboratories must be included. The surgical and nursing staffs must be of the best. Theatre accommodation and equipment must be ample and adequate to deal with any emergency.

Special preoperative and postoperative wards, for various purposes, must be provided. The organization must be perfect in every department so that patients may be received, housed, warmed, fed, transported, and otherwise attended to within the hospital without a hitch. It is obvious, further, that special arrangements for rapid evacuation of patients must prevail. It is possible to retain only such patients as will suffer unduly from further immediate transport. Put briefly, the functions of a casualty clearing station during a "push" are to save life, limb, and function where possible and, generally speaking, to fortify all patients against the effects of further transport. It must also eliminate and dispose of very slightly wounded men to selected hospitals or rest stations in the neighborhood. Such patients should be retained as near the fighting line as circumstances permit. They are usually fit for duty in a very short time.

Casualty clearing stations must be outside the range of ordinary shell fire. Apart from the consideration of a probable casualty list, the mental effect on the helpless wounded man of shells bursting in the neighborhood, or even of the noise of friendly guns, cannot be disregarded. The group of hospitals must be placed at a point where roads from the front, passable for ambulance cars, converge, where easy evacuation by ambulance train is possible, and where there is a good water supply. A special hospital siding from the railway line is essential. Other military considerations may prevent selection of what seems the best site. Suitable buildings are now rarely available. The hospitals have usually to be pitched in the open. The best site for easiest working, is on the side of a smooth, gentle slope, at the top of which runs the main road from the front and at the bottom the hospital siding. A system of light railways, as at Decauville, should be provided within the hospital.

It is easily appreciated that all these matters have a great influence on the surgical condition of patients as well as on the question of administration. The importance of warmth to a wounded man cannot be too much emphasized. During cold weather, under the conditions of campaign which exist on the greater part of the front in France, the problem of furnishing and conserving heat is a most difficult one. The difficulties in front of the casualty clearing station are often insurmountable. The casualty clearing station is looked upon by the wounded man as his first real haven of rest, and that haven must be warm, else it loses much of its physical and mental benefit. No detail should be neglected which will protect the man from cold on a stormy winter day. The temperature of the reception room, evacuation shelter, and other parts of the casualty clearing station is only of less importance than that of the operating theatre. Cold is possibly the greatest factor in maintaining or aggravating the condition of surgical shock produced by a serious wound on a man already predisposed by enormous physical and psychical strain. The badly wounded man should be under cover and

protected from cold from the time he is unloaded from the heated ambulance until he is evacuated to the base.

Rest is of equal importance. Efficient splinting and careful handling and driving minimize the evil effects of transport over rough roads until the most serious cases reach the casualty clearing station. In the casualty clearing station itself all arrangements should provide that patients are moved about or interfered with as little as possible until they have recovered from the journey and are fit to undergo the surgical treatment which they so urgently require. The less seriously wounded man benefits, comparatively speaking, as much from these arrangements as does his less fortunate comrade.

Many details of the general plan of dealing with patients cannot be discussed within the limits of this paper. Casualty clearing stations are arranged in groups of two to four each, and patients are received by them in turn, in numbers previously agreed upon. Two sitting cases are looked upon as equivalent to one lying case. The object of this arrangement is to assign to each unit such a number of cases as it will probably be able to deal with satisfactorily before the next batch comes along. It is desirable to set apart one or more casualty clearing stations in an area of fighting to deal with walking wounded. Efficient organization of stretcher bearers and other methods of transport in the casualty clearing station is of immense value to the smooth and rapid working of all departments of the unit.

Ambulance cars drive along a switch from the main road to the reception room door, where patients are unloaded. Waiting cars should not be opened up until their turn for unloading has arrived. A large porch on the reception room is advisable with wide doors on its three sides. Only the door on the lee side should be used on a windy day. Unloading should be done under cover when possible. The reception room must be large so that convoys of cars can deposit their burdens and depart without delay, after being supplied with stretchers, blankets, splints, hot water bottles, etc., in exchange for those brought down with the patients. These are handed over from a store situated further along the switch. Great care should be taken that the blankets are thoroughly dry. In the reception room, the patients' names and other particulars are entered in the admission and discharge book, equipment disposed of, clothing searched for ammunition, valuables put in a bag which accompanies the patient wherever he goes, etc. Fluid nourishment should always be on tap. Hot tea with plenty of sugar in it is most favored by British soldiers.

The patients are then taken to the dressing room where thorough examination is made and decision as to their further disposal is made. On this account the medical officers detailed for this duty should, if possible, be men of very sound judgment and wide experience in base as well as casualty clearing station work. Enough stretcher tables to cope with the work should be available. One medical officer can supervise four to eight tables, provided that one good nurse or orderly is detailed for each table. Another medical officer should deal with walking cases, if they have not been diverted

to a special casualty clearing station. It is preferable to deal with walkers in a separate dressing room. Severely shocked cases should not be handled at this period, unless they are showing signs of active external hemorrhage. Cases of fractured thigh should not be taken down until they are anesthetized on the operating table. In both instances, however, pain or discomfort should be allayed by suitable remedies.

Cases for immediate evacuation include all cases which do not require operation, with the exception of some penetrating chest wounds—pleural—with hemothorax, and cases which are suffering from such exhaustion and shock that their condition would be still further jeopardized by a railway journey. Wounds which do not require operation should be carefully dressed. In all other cases it must be remembered that unnecessary handling is very detrimental. If clear notes from a field ambulance officer accompany the patient it may be unnecessary to look at his wounds till he is on the operating table. If it is necessary to overhaul and redress his wounds, a note should be made for the guidance of those dealing with him afterward of the nature and number of wounds and which are the most severe. For this purpose a special note clerk will be of great assistance. Dressings should be fixed in as simple a way as possible.

Light cases for operation are sent to a light pre-operative ward, where they are prepared. Very wet clothing should be changed, but otherwise it is unnecessary to undress them more than will expose their wounds or prevent clothing from being soiled at operation. In turn they go to a light operating theatre, light recovery ward, where they are retained until they have recovered from the effects of general anesthesia, and finally to the evacuation shelter. Hot drinks for the more severely wounded and more ordinary food for the very slightly wounded must be provided in some easily accessible marquee or hut. Severe cases for operation are distributed according to the nature of their wounds and their general condition, to different wards, en route for the severe operation theatre.

The bulk of these cases are sent direct to the severe preoperation ward. Here they are undressed, washed, and put into warm appropriate clothing. They are warmed by various means and given hot nourishing drinks if they have to wait long for operation. Their wounds should not be interfered with if definite information regarding these has been sent from the dressing room. Otherwise, except in cases of fractured femur, an attempt should be made to estimate the comparative severity of wounds for the guidance of the operators in the theatre. The hair might be softened by soap dressing in head cases, if time does not permit of complete shaving or removal by depilatory paste. The medical officer in charge arranges the order in which cases are to be taken to the theatre.

The resuscitation ward is equipped with all necessary appliances and other remedies for restoring animation. Cases requiring special attention are sent here. Many suffer from such severe shock that they have to be literally coaxed back to a condition of reasonable vitality. Warmth, absolute rest, sedatives, and transfusions of various kinds are the chief

successful remedies. The sisters in charge should be most carefully selected. It is wonderful the amount of success which is achieved by some compared with others. A "shock team," medical officer and assistant, also specially selected, superintends the administration of blood transfusions, etc., and looks after the worst cases. They may be required from time to time in the operation theatre for similar work.

Men with severe penetrating chest and abdominal wounds should be sent to a special preoperation ward for special observation and treatment. In twenty to thirty-five per cent. of chest cases and in over ninety per cent. of abdominal cases, early operation is the only treatment which will save life, and that only if operation can be carried out early. It goes without saying, that skilful treatment in these preoperative departments will save many lives, and that an adequate number of trained attendants must be allotted to them. At the same time, one cannot refrain from remarking that too much attention is almost as bad as too little. Well organized, precise arrangements insure rapid and successful treatment. This applies as much to duties like stretcher bearing as to the most scientific procedures. A full supply of warm, dry blankets and of hot water bottles must be available.

It must be remembered that military exigencies will not admit of extravagant arrangements in operation theatres. With good surgeons, anesthetists, and attendants, it is found that results are equally good whether operations are performed in separate small theatres or in one large theatre common to all. The latter is therefore, under the circumstances, preferable. The size of the hut usually provided accommodates six tables easily. Everything inside the theatre should be arranged to allow the freest possible movement of stretcher bearers, without interfering with the work of the surgeon. Arrangements for washing and disinfection of hands, instruments, dressings, etc., and disposal of sterilizing, splint, and other rooms depend on local idiosyncrasies of men and locations and need not be discussed. Easy communication with the x ray department is essential. The problem of warming the theatre is one which requires most careful attention. The resources of New York are not available in a country devastated by war. The dispensary, or drugstore, and reserve of splints should be within easy reach of the operating theatres.

A large hut, or enough marquees roped together to make adequate accommodation, should be provided at or near the railway siding. Walking cases are kept in one part, stretcher cases in another. As already indicated, warmth is of much importance here as elsewhere, especially if walking cases have to be sent off in an unheated improvised ambulance train.

It has been found that the detailing of surgical teams, the members of which have worked together and know each others' capacity, has resulted in marked improvement both in the quality and quantity of the work done. A team consists of a surgeon, an anesthetist, a nursing sister, and an orderly. The number of teams and the number of other attendants must vary according to the estimated amount of work to be done. One or two tables more than

the number of surgical teams working in the theatre, should be kept for patients next for operation. An extra anesthetist, sister, and orderly attend to their preparation. Such an arrangement conserves time.

The work of the casualty clearing station should be judged from the condition in which its patients arrive at the base more than by the number of cases which it passes through, although in times of highest pressure the latter function becomes of equal if not of paramount importance. At all times the aim must be the greatest good to the greatest number. Experience alone teaches how that can best be attained. Many patients who obviously require early operation may have to be passed on. The surgeon fresh from civil practice will have many failures unless he at once models his work on the lines which bitter experience has taught to others. He will speedily find that war wounds in France behave very differently from those to which he is accustomed, unless they are treated efficiently on certain definite principles. If these principles are appreciated by American surgeons, common sense and good technic in their application will insure a great measure of success.

TRENCH DISEASES.

By JOHN E. LIND, M. D.,

Washington, D. C.,

Senior Assistant Physician, St. Elizabeth's Hospital.

(Concluded from page 220.)

TRENCH SHIN.

Description.—In describing trench shin as a separate disease entity, we are well aware that we are running counter to the expressed opinion of many good authorities, who hold that it is merely a symptom of trench fever. There is nothing to be gained, however, by arguing the case at length. Even if we admit that this is so, candor compels us to say that cases do occur where the fever itself is of short duration, but the tibial pain persists for many months, presenting a distinct and puzzling problem. We shall therefore consider it by itself as an affection of modern warfare which demands all the light which can be thrown upon it from any source. Trench shin might be defined then as a disease associated in some manner with life in the trenches, exhibiting for its cardinal symptom severe pain and tenderness over the tibiae, usually associated with a transient fever, leucocytosis, and some constitutional disturbance, running a somewhat protracted course, but tending to end in recovery.

Etiology.—This condition, like so many trench diseases, has been strongly suspected of being infectious. Chamber suggests that it may be caused by a microorganism with a selective action on fibrous tissue. This would explain the occurrence of myalgia, periostitis, ostiti, rheumatism, and neuritis. H. Campbell suggests that the severe headache sometimes seen may be a fibrositis localized in the meninges. Rosenow's experiments have shown that certain microorganisms undergo mutation on variation of the culture medium after successive inoculations into animals. The louse has been tried and found not guilty (MacLean, 1917). Constriction of the lower leg by puttees, garters,

etc., was held by many to be the chief cause, but MacLean holds that exposure and constriction must play but slight parts for if puttees were the cause the infantry would have the greatest number of cases which it did not in reality. Chamber, however, who has written what is perhaps the most authoritative article on the subject, says that puttees or tight bootlaces cause the condition by obstructing the venous circulation and producing loss of heat. Brown and Carr agree with this.

Pathology.—Several writers have described this as a myalgia, which disposes of the pathology by a stroke of the pen. Chamber suggests that it is a rheumatic infection, a sort of abarticular rheumatism. Bathurst says it is undoubtedly a fibrositis; Chamber believes there is a periostitic thickening. As there have been no fatal cases, there has been no opportunity to study the findings. X ray pictures have so far shown nothing definite.

Symptomatology.—There is nearly always fever in the early stages, lasting two or three days, and running from 102° to 103° F. Sometimes a low grade fever lasts from five to ten days. The characteristic symptom is pain over the tibiales antica; there is tenderness on pressure, especially over the bone itself. This pain is usually bilateral, but may rarely be unilateral; it is a dull, aching pain, increased by any sort of movement, especially by walking, and relieved by rest. It is worse at night. There are headache and malaise; the pulse is low, nearly always below 100, there is a polymorphonuclear leucocytosis lasting long after the fever subsides; the count is usually over 9,000, with a marked increase of lymphocytes. There may be pain in any other part of the body, and there quite frequently is pain in the back. Local examination of the tibiae shows extreme tenderness and possibly a periostitic thickening. In a few cases there is a slight redness of the skin over the internal surface of the tibiae.

Diagnosis.—Chamber gives seven symptoms on which to base a diagnosis of trench shin: 1, history of headache and fever in the early stages; 2, a leucocytosis, even without fever; 3, pain and tenderness over the tibiae; 4, neuritis of the arms; 5, pain in the ligaments and the bony prominences around joints; 6, increased pain at night; 7, prolonged course of the disease from one to three months.

The most delicate problem is to separate trench shin from trench fever. Houston and McCloy says they are the same and described four types, the two described by McNee, Renshaw, and Brunt (see above under Trench Fever), and in addition: type 3, a myalgic type, where myalgic pains persist after pyrexia has disappeared, and type 4, a septicemic type, in which there is a fever lasting from eleven to thirty days, with persistent headache, and sometimes rigors, nausea, and vomiting. Chamber says that such a concept would make what he calls trench shin only type 3 of trench fever, but he believes trench shin is a real disease entity on account of the fever, leucocytosis, headache, and rheumatic pains. The pain in the shins also lasts longer than it does in trench fever. The distinction, he thinks, rests in the fact that it is a fibrositis. A periostitis of the tibiae in typhoid can be easily excluded by the Widal, also by examinations of the

blood and stools. Syphilis can be excluded by the Wassermann reaction.

Prognosis.—The prognosis is good. The course is slow and variable, but recovery occurs eventually without sequelae. Many cases run a selflimiting course, getting well in fourteen to thirty days. If the pain diminishes from day to day we may expect recovery in from two to three weeks. If the leucocyte count is not very high the outlook for quick recovery is good.

Treatment.—Such of the above writers as believe that the cause is constriction of the legs, give the treatment as preventive, i. e., the avoidance of tight boots, puttees, etc. Chamber recommends rubbing the feet and legs with fat or oil as a preventive and wearing moleskin leggings or waterproof bags. Opinions differ as to whether these patients should be treated in bed or allowed to be up and about. Chamber believes in rest in bed and MacLean says light duty is better than rest. It is best not to use any bandage or permanent dressing on the leg, but the pain may often be decreased by liniments and gentle massaging. Bathurst says that a sinusoidal current applied rhythmically with the legs in a Schnee bath gives great relief to the pain in the early stages. Aspirin, phenacetin, and the salicylates may be tried, but as a rule these drugs have no effect on the pain. Morphine, or other opium derivatives, may be required and indeed may have to be used several times, but cannot of course be given indefinitely. Incision of the periosteum has been recommended for the intense pain which sometimes occurs, but this procedure can hardly be justified.

TRENCH BACK.

Most of the cases which have been given the name of trench back prove on investigation to be trench fever or trench shin, with the pain in the back a secondary symptom only. However there does appear to be a distinct condition, described by Sandes and others, of pain and rigidity in the dorsolumbar region, caused usually by the impact of heavy masses, earth, sandbags, etc. There is tenderness on pressure, and in some cases anesthesia, probably due to injury to the spinal cord. Some of these patients are able to walk, although bent over and needing the aid of a cane; others have to be carried. An x ray examination should always be made to determine whether or not there is a definite injury which can be remedied by surgery or otherwise. Sandes recommends ionization for cases where there is no anesthesia. This procedure is described as follows: Prepare a one per cent. solution of sodium salicylate and saturate with it a large pad, eight or ten inches wide and long enough to stretch across the patient's back, the patient being placed face down. A chain mail electrode is put under the patient and bandaged firmly to him, and this electrode is connected with the negative pole. An indifferent electrode is placed on some other part of the body, say the upper dorsal region, is moistened with the salicylate solution and attached to the positive pole. The current is turned on gradually and kept on for fifteen minutes. This is done twice weekly. Some cases are cured by two or three treatments.

Sandes lays stress on the following points about

ionization: The indifferent electrode must be at least as large as the negative one. There must be at least six layers of lint between the mail electrode and the skin. The sodium salicylate solution must be no stronger than one per cent. A milliamperemeter is necessary; the current is to be thirty amperes at first, gradually increased to 100. Careful watch must be kept to prevent blistering, but the higher the amperage which can be applied without blistering, the better will be the results. Distilled water should be used for the solution.

OTHER TRENCH CONDITIONS.

Trench enteritis.—Lassablière has described a condition to which he gives the name of trench enteritis. It is an enteritis developing among the soldiers in the trenches, the chief symptoms being diarrhea and prostration. He gives as the cardinal symptoms frequent stools containing mucus or blood, tenesmus, and a very bad general condition of the patient. Lassablière recommends making up one or two litres of a mixture of one part condensed milk and four parts rice water, and confining the patient's diet to this. Rapid improvement, he says, takes place under this treatment.

Trench diarrhea.—Rathery and Bisch describe a severe diarrhea very much like a dysentery, developing in the trenches. The symptoms are those of ordinary dysenteriform colitis. X ray pictures have shown an accumulation of fluid both above and below the diaphragm. In four of these cases abscesses of the liver were found which accentuate the resemblance to dysentery and furthermore emetin has been found to be an effective treatment. In the cases with abscesses recovery followed their evacuation.

Trench jaundice.—Jaundice was very prevalent among the soldiers in the Dardanelles expedition, and there have been many cases among the troops in Flanders. The former class of cases probably belonged in the category of epidemic jaundice, or Weil's disease, while the latter class showed nothing to distinguish them from any jaundice developing as a result of infection. The symptoms were largely gastrointestinal. There were present also insomnia, headache, malaise, and a fever of from 101° to 104° F., the temperature becoming normal after ten days. Many patients complain of nausea, shivering sensations, and pain in the gallbladder. The jaundice becomes marked after the fifth day. The cause has sometimes been found in tainted meat.

Trench rheumatism.—This, according to Comrie, is a painful and disabling condition of the muscles, chiefly of the back and legs, arising in some manner as the result of trench life. Comrie has reported a plan of treating this condition with colloidal sulphur. He reports sixty cases. Salicylates had little or no effect. Sulphur, he says, is a too little regarded antirheumatic. Pliny recommended it in ointments for lumbago, and also to be given in hot baths. Paracelsus eulogized it in the treatment of fever. Most "antirheumatic" waters depend on sulphur for their potency.

Colloidal sulphur, Comrie says, is manufactured with hydrochloric acid, sodium sulphide, sodium sulphite, and the whites of two eggs. Seventeen minims of colloidal sulphur with three minims of

saline solution are injected into the painful area of the muscle every other day for ten injections; on the alternate days rest is combined with massage. The reason for using colloidal sulphur is that each of the crystals presents surfaces measuring only 0.0001 millimetre while in precipitated sulphur they measure 0.005 millimetre. Comrie states that this treatment is of very great value in subacute painful myalgia and arthritis, and is also good in stubborn cases of gonorrheal rheumatism. In most cases recovery occurs in from three to five weeks.* He notes, however, that it cannot replace the salicylates in the treatment of acute articular rheumatism.

COMMUNICABLE DISEASES AMONG THE SOLDIERS IN ENGLAND AND FRANCE.*

By WILLIAM H. PARK, M. D.,
New York.

At the present time, the speaker stated, the subject of communicable diseases was very important now that great bodies of men were collected for training both in America and Europe. The places from which these men came had a great deal to do with the nature of the communicable diseases to which they were susceptible. Those who came from cities had, as a rule, suffered and recovered from the ordinary communicable diseases, such as measles, whooping cough, and mumps and had been exposed to others such as diphtheria and scarlet fever. Many of the men, however, came from small hamlets or towns in which none of these diseases had been prevalent for years, and when such men mingled together there was great opportunity for infection. It had been found in the training camps abroad as well as in the United States that measles, mumps and, to a less extent, scarlet fever, whooping cough, and chickenpox prevailed. Consequently, after the period of training was passed and these men went into active service, they had, as a rule, been protected by having had these diseases either before entering camp or afterward, so there was comparatively little of such infections at the front. Nevertheless, here and there, small outbreaks did occur. The diseases, other than wound infection, which had occurred most frequently in France and England were pneumonia and other respiratory diseases, meningitis, diphtheria, dysentery, and, in more southern climates, malaria. Vaccination had fortunately protected the troops from exposure to cholera, typhus fever, and typhoid.

Alarm had been expressed over the amount of tuberculosis said to be prevalent among the troops at camp and at the front, but these figures had been disputed. In England certainly there had been no increase in the camps and at the front there had been no great development. Among the French, however, it was very difficult to reach a conclusion on account of a considerable percentage of the troops having been accepted without a thorough examination and because of the lack of information as to the amount of tuberculosis among the civil population from which they came. A good deal of incipient tuberculosis had apparently developed but

*Abstract of address delivered before the American Congress of Internal Medicine, Pittsburgh, December 28, 1917.

many of those sent home for this cause had later been discharged from the hospitals as free of the infection.

A number of diseases had been prominent at the beginning of the war, but this essay was the result of study mostly of such diseases as meningitis, pneumonia, typhoid and paratyphoid fever, dysentery, and tetanus, in all of which preventive measures had been taken by means of antitoxin of vaccination, or the disease itself was treated with serum most effectively. Cerebrospinal meningitis was a serious menace during 1915 among the English troops in the home camps, less prevalent in 1916 but again serious in 1917. Each year the greatest number of cases occurred in February, March, and April, the season of the year having proved to be an important factor in the prevalence of the disease and the virulence of the microorganism. The meningitis problem had been far less important in the French army and the rigorous use of cultures to separate the carriers had been effective. They believed that swabbing the nasopharynx with carbolized oil was of advantage.

The seriousness of the situation among the English, however, caused a very thorough investigation of the means of spread of the disease and the best methods of prevention and cure, by the British Medical Research Committee and individual workers. Their findings corroborated those of the New York City Bacteriological Laboratories in 1906 as to carriers and of the Rockefeller Institute and the Health Department Laboratory as to the value of serum and the differentiation in the different strains of meningococci. The English investigation revealed the fact that there were many carriers for each case and these carriers seemed to be immune. When the carrier rate was low the case rate was usually moderate and vice versa, probably due to the degree of virulence of the meningococci. In England in about ninety-seven per cent. of the cases, four types of meningococci were found, differing from each other in their immunological attributes and not immunizing efficiently against other types. Prophylaxis and treatment were effected, the first by improving general living conditions as far as sufficient floor space and ventilation could be made good and inoculations of killed cultures and, of course, identifying and isolating the carriers; in some cases all the men in the camp or unit underwent thorough nasopharyngeal spraying at periodical intervals. Successful efforts were made to free the carriers by douches, sprays, and vapors. The most effective antiseptic solution for use in the spray was found to be chloramine-T in a one to two per cent. solution and zinc sulphate in a one per cent. solution, the latter being less irritating than the former. Only a portion of the carriers were cured by the treatment. In regard to treatment, the English and French authorities had come to regard serum as of great value, but to be efficient it should be potent against the types of meningococci occurring in the cases.

Immunization against typhoid and paratyphoid fever through vaccination had been one of the greatest medical accomplishments of the war. The military and civil authorities of all countries were in accord as to this. The results in the French army

had been most striking. At first, owing to the fact that less than one half had been vaccinated, a great many thousand cases of typhoid fever developed. Later when the army was completely vaccinated against typhoid and paratyphoid fever it became almost free from these infections. The English from the start vaccinated all their troops against typhoid fever and after the first year against paratyphoid. Consequently, cases of typhoid or paratyphoid fever were very infrequent.

Dysentery of the bacillary and amebic types had been moderately prevalent in both the French and English armies, the latter occurring during all seasons of the year while the former occurred only during hot weather. Unfortunately there was no specific treatment to prevent infection in dysentery, but the ordinary precautions used against intestinal infections had been employed as thoroughly as possible. The vaccines so far prepared had been too toxic to be much employed. The use of suspensions of bacilli in oil was still in the experimental stage. Treatment by serum, however, was most effective, in bacillary infection and in amebic infection emetine bismuth iodide had accomplished good results.

Lobar pneumonia and bronchopneumonia, due to exposure or as a complication of measles and other infections, were common in the camps as well as in the fighting area. The clinical results of the treatment of many of the cases with serum was striking, the temperature usually falling shortly after its use. Borrel had also vaccinated all the men in two large camps, in one of which the cases became milder and less frequent about ten days after the second inoculation; in the other, however, the course of the epidemic was unchanged. The strain of pneumococci used came from a case in the first camp and the explanation of the failure in the second camp probably lay in the fact that the type was different. The results in South Africa had certainly been very encouraging and there was every indication for testing out the value in the American camps so that it was probable more would soon be known about it.

Tetanus was, of course, not a communicable disease under ordinary conditions from person to person, but it had been very prominent during the beginning of the war on account of the infection of wounds through dirt. The use of antitoxins having been made compulsory had brought about most satisfactory conditions, less than one in one thousand wounded now acquiring the infection, and either that small proportion had probably received no antitoxin or the injection had not been repeated. The serum in the developed cases in France was mostly given subcutaneously or intravenously to avoid anaphylactic shock. The British, in accord with American views, advocated the intraspinal method.

Doctor Park was particularly impressed, on his visit to Europe last spring, with the courage, devotion, and efficiency with which the medical men were doing their part. This had been appreciated by the French and English governments and had caused them to give them direct authority in all medical matters. Whether one visited the hospitals and laboratories in the rear, the hospitals and dressing stations at the front, or the quarters of the sanitary officers, he was everywhere impressed with the splendid progress being made in the prevention of

disease and the rehabilitation of the disabled. Last spring, there were practically no cases of gas infection, tetanus, or typhoid fever in either army in France. It might well be that the conclusion of this war would see such advance in the conquering of the ills of mankind that if nothing else were accomplished it could be felt that it had not been waged in vain and through its exigencies medical knowledge had taken great strides forward to the general health of the community.

MEDICAL NEWS FROM WASHINGTON.

Purchasing in the Army Medical Department—General Gorgas's Statement on Camp Conditions to the Senate Military Committee.—Work of the Medical Supply Depts of the Navy Medical Department.

WASHINGTON, February 5, 1918.

Purchases of all material of a medical and surgical character for the army Medical Department are to be concentrated under one officer, Colonel Carl R. Darnall, M. C., on duty in the Surgeon General's office at Washington. He will have as his assistant First Lieutenant Lawrence Lang, of the Sanitary Corps of the National Army, recently commissioned, and a civilian expert who has been attached to the purchasing office of the Surgeon General's Office. Other officers will be in charge of inspection, transportation, and statistics, with the result that there will be a centralization of the functions of obtaining bids and awarding contracts and passing upon material before delivery. By this means it will be possible to transfer to the central office at Washington the work that hitherto has been divided between similar offices maintained at Atlanta, San Antonio, Chicago, Louisville, and San Francisco. The only exception to the centralization of all purchases under the Surgeon General will be that of the material needed by the gas defense division, where the type of mask and the material used in connection with it are matters of constant revision.

* * * * *

When Surgeon General Gorgas recently was before the Senate Committee on Military Affairs, he brought out, what already was generally known, that the army Medical Department had taken the most thorough measures to safeguard the health of troops and that much of the disease that had existed at camps was due directly to disregard of his recommendations for the expeditious and complete equipment of hospitals and of his warnings against the overcrowding of men in cantonments and tents. General Gorgas pointed out that, in its haste to answer the call from France and England, the Government sent many young men to their death from disease, caused by overcrowding of cantonments and inadequate hospital facilities and nursing. He declared that in some camps hospitals were not yet completed; in practically none had steam heat been furnished; and in all forty untrained drafted men had been placed on duty caring for the sick. He declared that his urgent recommendations for construction of hospitals coincidentally with the building of cantonments went unheeded, and his warnings against overcrowding were disregarded by the Secretary of War because the chance was taken in an effort to get men trained and overseas.

The statement also was made that the Surgeon

General was still waiting and hoping for a ruling on his recommendation, made months ago, that hospital ships be provided for the army. The navy was to bring him the sick and wounded, he was told, but, as he pointed out, the navy has only three hospital ships, which it needed itself. This would force the army to use transports, which under the Geneva convention are subject to submarine attack. After the committee had listened to the Surgeon General's recitation of his efforts to get hospitals built and equipped, and his story of failure because the Medical Department of the army was held as relatively unimportant, Senator Wadsworth, of New York, observed that the testimony furnished a perfect instance of the lack of team work and planning of which the committee had complained of as characteristic of the entire conduct of the war.

* * * * *

The system of medical supply depots of the navy Medical Department is working with thoroughness in order that no materials and supplies may be accepted that do not in every way meet the requirements. The most careful examinations and analyses are made of samples submitted by bidders prior to acceptance of the bid and the awarding of a contract, and every subsequent partial or complete delivery by the successful bidder is examined as to specified requirements before acceptance. Surgical instruments are inspected at the factory when forged and before hardening, tempering, and finishing. Suture material, particularly catgut ligatures, is inspected before delivery and after sterilization, and they are tested for pliability and tensile strength by a special apparatus. Drugs and chemicals are subjected to a chemical analysis to establish their conformity with standard requirements. Instruments of precision are tested individually for accuracy before acceptance or issue.

An example of the volume of this work is had from the medical supply depot at New York, where last year there were 216 analyses on drug deliveries and twenty-four rejections; fifty-five analyses of hypodermic tablets and thirteen rejections; forty-six analyses of textiles and no rejections; thirteen analyses of rubber goods and two rejections; thirty-five inspections of instruments and four rejections; and twenty-nine analyses of surgeons' necessities and seven rejections. The disturbance of trade conditions due to the war in Europe has made it incumbent on the supply depot to find equivalent substitutes for many substances not manufactured and no longer available in this country or else obtainable only at prohibitive cost. Since war became inevitable, the supply depots have taken all steps to provide for the demands of war service.

A new synthetic product for ready and accurate preparation of the Carrel-Dakin fluid and a suitable paraffin preparation for the treatment of burns are in stock for issue. Substitutes for argyrol, protargol, and ichthyol also have been secured in large quantities. A modest item, but one that may prove in time the saving of hundreds of dollars, is the issue of bolts of rough toweling material to replace in part the high grade towels previously in use. Of great practical utility is the standardization of all needles for hypodermic and intramuscular injections.

Editorial Notes and Comments

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O LORD, HOW LONG?

We have been told and are still told that syphilis and gonorrhea are selfdestructive diseases and that they sterilize their victims and tend to diminish soil for future culture. This sounds scientific and encouraging, but the process is certainly most woefully long drawn out. It resembles in its tediousness the war, but during its process of selflimitation war is not to be compared to it for destructiveness.

A great deal of semioutspoken public education has gone forward in recent years, and the war has helped with this schooling, in regard to these diseases, but they are still handled in a most gentle, nay, sissy fashion, as if they were special forms of disease, privileged to have their own way to a large extent, no matter what the consequence to the public at large. These destroyers of life, present and prospective, these wreckers of human happiness, like some gentleman dastards, must be whispered about even by health officials and allowed to do their devilish work. Is it because the marks of these diseases were once the pride of kings? There seems no other or better reason.

If a neighbor has diphtheria we have a right to know it through our board of health, and we expect to know it, that we or our children may at least keep ourselves away from the carrier of contagion. But if a neighbor has syphilis or gonorrhea the matter is kept a profound secret, no placard appears on the house, no isolation is done. Even if the diseased one is courting our dearest daughter it is all the same. There is no help for it.

We make a great disturbance nowadays over the wonderful discovery of carriers when carriers of these worst of plagues have been known for centuries. We spend infinite pains and not a little cash, in searching out and controlling a typhoid Mary; we make no effort whatever to deal with syphilitic Sarah or gonorrheic Jimmy in a like competent fashion, and yet typhoid Mary is innocent in every sense by comparison. We have been, in a half and half way, carrying forward some education of the public in matters of sex. The veil of mystery behind which diseases of sex breed luxuriantly has been lifted to a certain extent. It remains to put these diseases on a par with, or at the head of, the other communicable diseases, to give them no special privileges, to see that they are reported, and that they are labeled for the public gaze, as they deserve. If need be a time limit might be set as to when such a ruling should go into effect so that the limelight might not fall too unexpectedly. When time was that men gloried in the outward signs of these diseases such a public health move might have been ineffective but that is not the case now.

If promiscuous sexual indulgence must go on, and doubtless it will, the enforcement of such a law must have its salutary effect in stimulating the indulgents on both sides to all possible prevention of contagion, in which case the indulgence itself is robbed of half its evil effects upon society. The "social" diseases are not more social than, nor as respectable as, smallpox or typhoid. They are in like manner communicated by carriers. Their effects are as dire and devious. Is there any reason why they should be handled differently, more gently, or less scientifically? Or must we wait for venereal disease to destroy itself?

ITALIAN PHYSICIANS AND THE WAR.

In this time of Italy's peculiar danger and need the medical profession there is seeking to realize its responsibility and opportunity. This effort on their part, expressed in the organizing of Italian physicians in various groups to promote and carry out a definite purpose, has inspired one of their number

to outline briefly some of the duties and opportunities devolving upon the profession as a whole. Professor Enrico Marselli presents this outline in the *Gazetta degli Ospedali e delle Cliniche*, December 6, 1917.

Both the acute situation in Italy and the differing conditions in population, as well perhaps as the status of the medical profession in general, necessitate emphasis upon certain factors other than those that specially confront our physicians here. The general principles enunciated are those of which it is well for us also to take heed. Some of these are simple and generalized, but if carried to their fullest extent they would embrace a program of widest usefulness and service.

First of all attention is called to the duty of the physician in matters of private experience and research and the application of material thus obtained to public use. Then there is the example to be set because of the special position of medical men as a class, an influence toward calmness, faithfulness, and firmness of purpose in the face of the uncertainty and timidity which circumstances might breed. They, too, have a part in the sacrifices by which everything is devoted to the country's need. It is important to remember in dealing with patients, particularly recruits, how much suggestive power and influence lie in the physician's own spirit and manner. Specifically, it is in the physician's hands to regulate the length of furlough on account of illness or wounds according to the best interests of the army, to regulate the clearance of hospitals of convalescents, and to provide as far as possible the most adequate care in the exigencies of battle. Readiness of action and energetic decision as well as attention to the disorders and disabilities which this war has brought to the forefront of interest, the psychic being none the least of these, are important in the physician's equipment for his peculiar and diversified task.

He has also a duty toward the civilian population first in the important matter of diet. This is coming home to our own more bountiful land where a new interest has arisen in these problems, the wise use of dietary material based upon a better knowledge of food value, the giving up of faddist insistence upon certain articles, and the willingness to feel to some extent the pinch of privation. The crusade against alcoholism and prostitution should occupy the physician's attention and demand his organized effort, while other broad social problems, such as the matter of expenditure on the part of the rich for the country's need, and the providence of the working people should be included in the physician's wider consideration.

His energies should be directed through these

various channels to the conservation and regulation of the nation's forces. This needs sympathy with the people and education and personal attention and the force of the physician's own personal attitude directed to these ends. This means a program which extends no less to the times of peace to follow than to the extreme distress of the war at the present day.

GEORGE BERNARD SHAW AND THE DOCTORS.

There is so much bad in the best of us that it ill becomes the most of us to take either too humorously or too seriously any diatribe which exposes the seamy side of our apparent virtues. George Bernard Shaw, it would seem, meant us to do neither when he wrote *The Doctor's Dilemma*, even with its essay introduction, nor any other of his attacks upon modern institutions. It can scarcely be said therefore that William Marion Reedy in his comments upon A Dramatist on Doctors (*Medicine and Surgery*, December, 1917) adopts too serious an attitude toward Shaw's position and expression of sentiments. Yet he is somewhat ill at ease as to the attitude to assume toward the play and still more toward the long disquisition on the part of the author, which precedes it.

To be sure the hobby which Shaw delights to ride in regard to medical problems and the handling of them by the medical profession is something of a Jabberwock beast and one might withdraw with even more indignation than trepidation from the seeming virulence of "the jaws that bite, and the claws that snatch." After all is not this alarming beast in reality a wholesome friend in disguise merely seeking to tear from society's ways and its somnolent acceptance of them much of this very stultifying concealment of the real issue at the heart of things? The keenness of his criticisms may well be accepted, overlaid though it may be to some extent with the extravagance of his caricature and thrown more than a little out of perspective perhaps by the cavorting of his own particular hard ridden beast. In accepting Shaw to our profit two things need to be remembered. The first is that his criticism is never intended to be exclusively directed toward one institution or one class of society. It is the medical profession here, narrow religious dogma there, the marriage institution in another place, and the time honored relation of parent and child over in another corner.

All these, and this Shaw sees and against these he rides in the service of liberation from bondage, all these are full of gaps and rents, which society dimly discerning has always sought to conceal and

patch over before they ever became truly visible. Man has never been courageous and honest enough with himself and gone out frankly, to meet things as they were. In ages past he was less inclined to candid recognition, perhaps only because handicapped by profound ignorance of actual forces and their mechanisms, both without and within himself and yet driven in haste to make some compromise with them. Early thinking established society upon a false and insecure basis, and so all too much effort has perforce been directed to continuing this false security as better than none. We are awaking, however. Interest in causality has traveled from the physical sciences to mental life and we are coming to realize as never before that human motives, human strivings, and the mechanisms of distortion which they have used must be dragged from under the imperfections, hypocrisies, and compromises which have obscured reality, most of all in the individual self. Men, to expand and serve self and race truly, need to know themselves. It is a service therefore, and one to which Shaw is artistically keen, in spite of some special viewpoints of his own, that he can reveal through the medical profession or any other great institution some of the foibles and self-deceptions which exist within it, or over it, touching even its most excellent exponents. He appears unfair and harshly and cynically critical, because the thing most of all from which human thought has defended itself is the recognition of the crass, direct egoism, the self-centered motives out of which all action arises.

Yet Shaw himself in his writings is the last one to fail to see that this selfcentering is not altogether that which we are accustomed to conceive under this designation. This is the second consideration in appraising Shaw's work. He wholesomely heads his audience about to look straight into the source of human motives and discover the ultimate selfseeking that must necessarily lie therein. With an artistic cleverness he clears the brambles from this truth, which practical therapeutic psychologists are more laboriously helping their disturbed patients to understand. Once they, once we all, know this truth better, we shall have a better grasp of the forces with which each life is working, whither they tend, and the value and meaning of the methods they employ. This makes for understanding, some shock and repulsion at first it may be, but in the end a better recognition and control of our working material of every sort within and without ourselves. This no doubt accounts for the optimistic spirit which surrounds any one of Shaw's writings in its final outcome, in spite of occasional insistence on some plan of his own conception or adoption, an ultimate faith in the gradual working out of solu-

tions to the problems involved. These are to be plastic, adjustable, capable of adaptive modification, but depend upon the inherent forces and tendencies themselves. These it is Shaw's task to uncover and reveal in their nakedness behind the false conventions and assumptions with which they are obscured, thus to make them free for better service.

TUBERCULOSIS OF THE UTERINE ANNEXA.

The pathogenesis of tuberculosis of the tubes and ovaries is a muddled question, because of the many discussions as to the possibility of its being a primary lesion. To read the published works of many it would seem as if the important point was to ascertain whether or not the tuberculous process in the annexa was primary and the only focus of the disease in the patient. The interest of this question is very much more theoretical than practical. In theory, in order that a localized tuberculous process shall be called primary, it is necessary that no structure or viscus shall have been the seat of any tuberculous lesion, no matter how infinitesimal, otherwise the lesion in the annexa must be looked upon as secondary.

In surgical practice, the conception is otherwise, and it is important to ascertain whether the local focus is the only one present and whether no other focus can be detected clinically. Clinically, a minute focus in a lymph node is of little import if it is to remain latent and undetected until its bearer comes to autopsy or the gland is examined microscopically. The evolution and treatment of the apparent lesion will in no way be modified and it has been estimated that only one case of tuberculosis of the annexa out of 100 is theoretically primary, while from the clinical viewpoint from thirty to fifty per cent. merit this designation. Logically, the class of secondary tuberculoses must be subdivided still further and, beside the truly secondary lesions, such for instance as a miliary process following a pulmonary tuberculosis, it must be shown that the cases present two tuberculous localizations which are simultaneous and are derived from a common focus, the so called secondary primary localization. For example, a patient with pulmonary tuberculosis infects herself with her own sputum, resulting in an external autoinfection. Then there are those who produce two different successive infections where the bacilli come from two distinct sources. It is most likely that a difference in virulence would result from the difference of the origin of the bacillus. One case

recorded by Celler would seem to sustain this point of view.

From the pathogenic viewpoint a distinction is made between those cases in which the bacillus infecting the uterine annexa starts from an already existing lesion in the patient and those in which the organism coming from without simply produces a single focus of infection. Theoretically, this is the difference between primary and secondary cases. A secondary contamination supposes that an initial focus of the disease already exists in the patient and can be recognized clinically. Under these conditions it is more apt to be a pulmonary or intestinal tuberculosis or tuberculous abscess in some cluster of lymph nodes, less commonly cutaneous lesions or those of the bones and joints. The focus may be a latent one and may be often discovered only at autopsy in the tracheobronchial or mesenteric glands.

From the initial focus the bacillus on the road to set up various disseminated foci usually follows the lymphatics, then the venous system, and last the arterial system by which the organism reaches different points of the body. Propagation by tissue continuity can occur by a progressive extension at the periphery of a tuberculous focus. The fact that the bacillus has attained the tube or ovary is not sufficient to explain why it results in an infection of these organs, for it may be destroyed or eliminated, and the question arises as to what circumstances are favorable for its fixation. Of all the genital apparatus the tube is by far the most frequent seat of tuberculosis and the ovary far less so. Anatomically, this is explained by the fact that the tube is an almost closed cavity which favors stagnation of fluids within it, and since the tubercle bacillus is a lazy individual, it can take all the necessary time for the production of its work. The epithelium of the tube is more fragile than that of either the uterus or vagina, and, like the tonsil, the folds of the tubal mucosa seize upon and hold foreign bodies.

Such are the general reasons which explain the greater number of cases of tubal tuberculosis than other similar lesions of the genital tract. But tuberculosis, in order to become implanted in a tissue, has need of a momentary or permanent, or at all events, a somewhat prolonged, suppression of the natural organic defense; this is offered by an inflammatory process, a dystrophy, or a neoplastic process. A well known fact is that acute inflammatory processes, such for example as a gonorrheal cystitis, in many cases prepare the infection of a viscus. The tissue changes resulting

from the acute process lose their resistance and in the tube inflammation acts by the desquamation of the epithelium that ensues.

The ciliated epithelium is an excellent barrier against the tubercle bacillus so that when it is shed invasion takes place in the tube just as in the bronchi. Therefore, a gonococcal or puerperal infection of the tube may become secondarily infected by tuberculosis, and this also applies to hydrosalpinx. The gonococcus is unquestionably the agent which the tubercle bacillus most frequently succeeds, but both organisms have been met with simultaneously, while an association with the pyocyanic bacillus has been observed by Williams, Saulmann, and Péraire.

A PROHIBITORY TAX.

At the last moment before its passage, an amendment was introduced into the war revenue bill, which provided for the establishment of a zone rate of postage on periodical publications. This was passed over the unanimous and urgent protests of all the publishers. If it is allowed to remain a part of the law, it will become necessary for the publishers of periodicals of national circulation to make varying rates of subscription for their journals in accordance with the postage zones. The man who lives in Hawaii is an American citizen and should receive his mail at exactly the same postage rates as the man who lives in the District of Columbia. The very essence of penny postage is to unify an entire country, to bring all the people closer together, to consolidate the sections into a whole. This principle has remained unchanged and all the postal systems of the world have been built upon it. The introduction of zone rates of postage for merchandise, though apparently a novel and antagonistic feature, does not in fact bear upon the subject at all, for parcel post is really a misnomer, it is in fact a Government express service, and introduces a wholly new factor, the commercial package of goods as distinct from written or printed matter for which the penny post was really devised.

To apply a zone rate of postage to technical periodicals is to penalize the scientist who lives in the remoter sections. He is already sufficiently penalized in being shut off from personal contact with other men doing similar scientific work. But he can find some compensation for this and keep in touch with the scientific world through current periodicals. Now comes the iniquitous zone system of periodical postage, to further penalize him for living outside the publishing centres. Every doctor will be seriously affected by this zone rate of postage. He can and should make himself heard on this subject; he should support every effort to maintain the integrity of the intercommunication of scientific thought. He should make it his business to write at once to the members of Congress and Senators from his section urging the prompt repeal of this ill considered legislation.

News Items.

Cape May Hotel a War Hospital.—The Hotel Cape May, at Cape May, N. J., has been leased by the government for hospital purposes, at an annual rental of \$99,000. It has 600 rooms. The hotel is within two miles of the Henry Ford farm, on which are located the Wissahickon Barracks, where about 3,000 naval reserve men are being trained.

Meetings of Medical Societies to Be Held in Philadelphia during the Coming Week.—Monday, February 11th, County Society, Board of Directors; Tuesday, February 12th, Pediatric Society; Wednesday, February 13th, County Medical Society; Thursday, February 14th, Pathological Society; Friday, February 15th, Logan Medical Society.

The New York Academy of Medicine Tenders a Vote of Thanks to Medical Publishers.—At a meeting of the New York Academy of Medicine, held Thursday evening, February 7th, it was voted unanimously to tender a vote of thanks to W. B. Saunders & Co., of Philadelphia; D. Appleton & Co., of New York, and William Wood & Co., of New York, in appreciation of their gifts of medical books to the library.

A British Pneumonia Serum Tested at Camp Upton.—It is reported that 15,000 officers and men at Camp Upton have been inoculated during the past week with an anti-pneumococcal serum which was employed with good results by the British in South Africa. If it proves successful, the whole military population of Yaphank will be treated. The serum is prepared under the direction of Dr. Harold Austin, of the Rockefeller Institute.

Enrollment of Dental Students Suspended by the Navy Department.—Under the ruling that war and navy departments might admit into their services dental and medical students and furlough them while attending college courses until required for duty, the navy department announces that it will enroll no more dental students at present, as the department has at present all it can carry on its rolls. Medical students are still needed, however.

Members of Medical Unit Return from France.—Seven medical officers, fifty-one men, and two nurses arrived at the hospital at Fort McHenry, Md., on January 25th, invalided home from France, where they have been with the American Expeditionary Force. Most of the officers have been doing medical work with the British Army in front line trenches. The patients are suffering from various troubles, but few were actually wounded. Some have had nervous breakdowns, others suffered from shock, and still others were sent home on account of physical defects, which rendered them unfit for service.

Discussion on Endocrinology.—At the 362d regular meeting of the New York Neurological Society, held at the New York Academy of Medicine, Tuesday evening, February 5th, under the presidency of Dr. Frederick Tilney, the general topic for discussion was Some Recent Developments in Endocrinology. Dr. Walter Timme, of the Neurological Institute, delivered an address on Clinical Manifestations and Basis for the Treatment of Some Endocrinopathies, and Dr. Frederick Tilney spoke on Is the Pinea Body a Gland or a Vestige? Both papers were illustrated by lantern slides. A general discussion followed, which was opened by Dr. Smith Ely Jelliffe and Dr. W. N. Berkeley.

Meetings of Medical Societies to Be Held in New York during the Coming Week.—Monday, February 11th, New York Ophthalmological Society, Society of Medical Jurisprudence, Williamsburg Medical Society, Brooklyn; Tuesday, February 12th, New York Academy of Medicine (Section in Neurology and Psychiatry), New York Obstetrical Society; Wednesday, February 13th, New York Pathological Society, New York Surgical Society, Alumni Association of Norwegian Hospital, Brooklyn, Medical Society of the Borough of the Bronx, Richmond County, N. Y. Medical Society, Brooklyn Medical Association; Thursday, February 14th, New York Academy of Medicine (Section in Pediatrics), West Side Clinical Society, New York, Brooklyn Pathological Society, Society of Sanitary and Moral Prophylaxis, New York; Friday, February 15th, New York Academy of Medicine (Section in Orthopedic Surgery), Clinical Society of the New York Postgraduate Medical School and Hospital, New York Microscopical Society.

Gifts for Research Work at Columbia.—For research work in war problems Columbia University has received \$3,000 from an anonymous donor, and Clarence Mackay has given \$5,000 for surgical research.

Harvey Society Lectures.—Dr. J. Gordon Wilson, professor of otology at the Northwestern University, Chicago, will deliver the sixth Harvey lecture, Saturday evening, February 9th, at the New York Academy of Medicine, the subject being the Effect of High Explosives on the Ear.

Associated Physicians of Long Island.—At the sixteenth annual meeting of this organization, held in Brooklyn, Saturday, January 26th, the following officers were elected: Dr. Leifferts A. McClelland, of Brooklyn, president; Dr. William H. Hulze, of Bay Shore, first vice-president; Dr. Henry Goodwin Webster, of Brooklyn, second vice-president; Captain Harris A. Houghton, of Bay Side, third vice-president; Dr. James Cole Hancock, of Brooklyn, secretary, and Dr. Edwin S. Moore, of Bay Shore, treasurer.

Personal.—Dr. B. K. Rachford, Dr. J. C. Oliver, and Dr. Roger Morris, members of the staff of the College of Medicine of the University of Cincinnati, have been appointed a committee to attend to all matters relating to the administration of the college during the absence of the dean, Major Christian R. Holmes, who is at present on active duty at Camp Sherman.

Dr. A. Weise Hammer, of Philadelphia, has been appointed surgeon to the Pennsylvania Railroad.

Dr. E. V. McCollom, of the Johns Hopkins University, will deliver the annual Packard lecture of the Philadelphia Pediatric Society, on Tuesday, February 12th, the subject being Growth.

Dr. Russell A. Hibbs has been appointed professor of orthopedic surgery at the College of Physicians and Surgeons, Columbia University, and Dr. Eugene W. Caldwell has accepted the newly established chair of roentgenology.

A New Medical Department Bill.—Representative Hicks has introduced in the House of Representatives a bill (H. R. 9311) which provides for the reorganization of the medical department of the United States Army. The principal features of the bill are an increase in the rank of the higher officers, the bill providing for one major general, five brigadier generals, twenty colonels, twenty-four lieutenant colonels, 120 majors, and 316 captains and first lieutenants; that when engaged in active military operations, that is, when a state of war exists, the transportation necessary for the medical department shall be under the control of the medical corps. The bill further provides for the establishment of a department of pharmacy with a colonel at its head and a suitable number of other commissioned officers, all of whom shall be graduates of some recognized college of pharmacy. The bill has not so far been passed upon by the Surgeon General, and it is not known whether or not it meets with the approval of that officer.

Reorganization of the New York State Board of Charities.—Bills have been introduced into the legislature by Assemblyman Schuyler M. Meyer, of New York, providing for the reorganization of the State Board of Charities in accordance with recommendations made by Commissioner Strong, who was appointed by Governor Whitman, about two years ago, to investigate charity organizations in New York. Instead of an unpaid board of twelve appointed by the Governor from districts, with eight year terms, there is to be a board of nine, of whom at least one must be a woman, and of whom three are to be paid. They are to be appointed by the Governor from the State at large and are removable by the Governor on notice for cause. Special qualifications for membership are described in the law. The three paid members are the president and the chairmen of two new bureaus within the board—Bureau of Mental Deficiency and Bureau for Dependent Children. These three members are to give all their time to the service. The qualifications required of the members have special reference to the several classes of State institutions supervised by the board. There are to be a penologist, an educationist, a physician with special knowledge of tuberculous diseases, a general practitioner, a lawyer, a physician with special training in psychiatry, to serve as chairman of the Bureau of Mental Deficiency; a specialist in the care of children in private institutions and in foster homes, to serve as chairman of the Bureau of Dependent Children, and one generally conversant with dependency and the several forms of poor relief.

Modern Treatment and Preventive Medicine

A Compendium of Therapeutics and Prophylaxis, Original and Adapted

TREATMENT OF SLEEPLESSNESS.

By LOUIS T. DE M. SAJOUS, B. S., M. D.,
Philadelphia.

(Continued from page 229.)

The relatively great importance of hyperemia of the vessels supplying the central nervous system in the pathogenesis of many instances of insomnia was pointed out in the preceding issue, and certain measures calculated to relieve the condition by withdrawing blood to other parts of the body described. A feature to be borne in mind, furthermore, is that derivative treatment may prove of service even in the absence of actual cerebral hyperemia, the difficulty in some forms of insomnia being apparently not so much a congestion of the intracranial vessels as an inability of these vessels to contract to the extent which obtains in normal sleep. Especially effective among the physical derivative measures are those of the hydrotherapeutic group, some of which have already been referred to. As stated by W. J. M. A. Maloney, 1913, nightly sitz baths at 80° F., lowered by two degrees at each successive bath, are sometimes of value. The duration of such a bath should be about three minutes, and the patient, after rapid drying, should then be hurried to bed. A hot foot bath is especially useful in subjects with sedentary habits, troubled with cold feet. Here, however, the therapeutic effect may not accrue exclusively through removal of blood from the intracranial distribution, as the sleeplessness seems at least partly due to the unpleasant sensory stimuli received by the centres from the cold extremities, and the hot foot bath therefore acts in part by overcoming these sensory stimuli through restoration of the local circulation. The same result, in sleeplessness due to ischemia of the feet, can be even better secured, according to Broadbent, by substitution for the hot foot bath of a running, cold foot bath for a few minutes, with subsequent drying by means of a rough towel. Another local hydrotherapeutic measure which has been suggested in insomnia is the application of a cold wet towel round the neck of the recumbent patient, doubtless with the object of causing a reflex contraction of the arterial channels to the head.

Postural treatment of congestive insomnia is not only feasible, but constitutes one of the most easily applied remedial means in the less severe cases. While a low pillow, or even no pillow, is by no means incompatible with satisfactory sleep in the normal subject, the immediate effects of removal or even mere lowering of the pillow in one habitually using a thick pillow leave no doubt of the possibility of modifying the depth of sleep through changes in the position of the head. Lowering of the pillow may not only cause a feeling of intracranial fullness or actual throbbing sensation, but leads frequently to an unusual amount of dreaming—an acknowledged accompaniment of brain congestion. Raising

the pillow, when ordinarily used low, may be expected on the contrary to favor decongestion and sleep in the congestive type of insomnia. An excessive height of the head is, however, to be guarded against, both because of resulting discomfort, tending to defeat the purpose of the postural treatment, and because the head may sag down upon the chest during sleep, thus obstructing the return of venous blood from the intracranial circulation and causing the patient to dream or waken.

Another method of utilizing the favorable action of gravity in congestive insomnia consists in temporarily leaving the recumbent posture, to induce rapid descent of the blood from the intracranial circulation; subsequently recumbency may be resumed with much improved chances of dropping off to sleep. In the less inveterate forms of sleeplessness, merely sitting up in bed for a few moments proves at times sufficient greatly to facilitate sleep induction. The continuous flow of sensory stimuli which excites the vasomotor centre during the daytime and keeps the brain circulation active being interrupted in the quiet, dark bedroom, gravity will under the latter conditions all the more readily influence the distribution of blood since the vasomotor centre is then in a relaxed state, the reaction from the increasing vasomotor fatigue during the day, and is no longer in a position effectually to resist the action of gravity in withdrawing blood to the dependent parts. Obviously more effective than the temporary sitting posture is the standing position, assumed for a brief period, after getting out of bed. To this may be usefully added at times the application of cold water to the head, neck and hands. According to some, furthermore, it is of advantage to stand or walk until chilliness is felt, and only then return to bed. In passing it is of interest to note that William Harvey and Charles Dickens are recorded as having adopted this expedient when sleepless. Chilliness would naturally be attended with contraction of the skin vessels, a condition which might be thought to augment rather than diminish intracranial circulation. Secondly to the cutaneous vasoconstriction, however, there occurs a reactive vasodilatation. Even were the exposure to cold to continue after the beginning of chilly sensations, cutaneous vasodilatation would tend eventually to occur, heat production in the body having meanwhile been automatically increased to make up for the lack of covering. In the sleepless subject returning promptly to bed, however, the secondary vasodilatation is hastened and accentuated by the rapid restoration of peripheral warmth due to the bed covering, and the derivative effect initiated by the standing position is correspondingly enhanced and perpetuated. In persons whose vasomotor system has become weakened through an exclusively sedentary occupation and lack of exercise, the effects of postural or static measures in congestive insomnia, it may be presumed, are likely to be all the more marked, the vasomotor system being less able to prevent the

gravitation of blood to the more dependent parts when upright positions are assumed.

An auxiliary measure in congestive insomnia is to insure a sufficiency, but no excess, of the bedclothing. Insufficient covering may not only tend to prevent, through prolonged relative vasoconstriction in the skin, the recession of blood from the intracranial circulation which normally accompanies sleep, but may also antagonize the oncoming of sleep through the unpleasant sensations of cold experienced. This applies also to an excess of covering, though here conditions are such as to favor cutaneous vasodilatation, and the preventive effect on sleep is not as marked as from insufficient covering. In a general way these facts necessitate a more careful adjustment of the weight of covering according to surrounding temperature variations for patients with insomnia than for the average individual, in whom sleep induction is less subject to hindrance by environmental conditions.

According to some, insufficient ventilation causes awakening from sleep as would noises or other sensory stimuli. Again, admission of cold air into the bedroom in such volume as to bring about chilling of the body may itself be expected to induce wakefulness. The influence of such factors as these is manifestly subject to marked variation according to the conditions under which the individual ordinarily sleeps. It is doubtless of advantage, however, from the therapeutic standpoint, to bear such factors in mind, that extreme conditions tending to prevent sleep may be duly corrected where present.

(To be continued.)

Transfusion of Unmodified Blood.—Lester J. Unger (*Journal A. M. A.*, December 29, 1917) analyzes the results which he has obtained from direct transfusion of unmodified blood in a series of 165 cases and states the following as the indications for transfusion: 1, hemorrhage; 2, blood diseases; 3, toxemias; 4, infections; 5, shock; 6, general debility. There were sixty-two transfusions done in forty-seven cases for the control or relief of hemorrhage. Of twenty-four cases with acute or chronic hemorrhage seventy-nine per cent. recovered, or a total of nineteen patients. Among these nineteen patients the recovery was due to the transfusion alone in twelve, and to transfusion combined with operation in the remaining seven. Among the latter, however, the transfusion was required before the surgeon would perform the operation. In fifteen of the cases, or sixty-two per cent., the transfusion was lifesaving. The conditions with which the hemorrhage was associated in these cases included gastric and duodenal ulcer, typhoid fever, postoperative hemorrhage, ectopic gestation, uterine hemorrhage, ulcerative colitis, jaundice, and blood diseases. Transfusion was found to be of value in pernicious anemia by the production of remissions and the prolongation of life in about half of the cases. It, however, did not otherwise influence the condition. In hemophilia transfusion was also of value to stop the bleeding, but, again, it did not have any influence on the disease itself. Purpura was little benefited and acute leucemia only very temporarily so, but in the hemorrhages of the newborn

transfusion was a specific and lifesaving measure. It was also found that if a transfusion in a case of pernicious anemia failed to cause a remission, a change of donor might prove successful. Among the toxemias, such as that of pregnancy and those associated with the acute infections with scurvy and with shock, transfusion gave decidedly encouraging results. This was especially the case in shock if done at the very onset of symptoms. The procedure also seemed to be of some value in overcoming intractable infections of a suppurative nature and greatly increased the vitality of such patients. In bacteriemias, on the other hand, it was without value. It was of material value in rendering some patients able to withstand operations which could not have been performed without its aid and proved capable of prolonging life in patients suffering with debilitating conditions such as cancer, hepatic and intestinal diseases, nephritis, and pemphigus. The transfusion of normal, unaltered blood was found to be far preferable to the use of any form of altered blood, even the citrated whole blood, specially where the blood transfused was to be used as a tissue. Its use was also practically devoid of the disturbing reactions which followed the administration of modified blood. The most satisfactory and simplest technique was the author's syringe cannula method.

Gunshot Wounds of the Chest.—J. Anderson (*British Medical Journal*, November 3, 1917) urges the adoption of measures to combat infection in chest wounds similar to those commonly employed in wounds of other parts. Anesthesia by nerve blocking through injections of 0.5 per cent. novocaine solution in the intercostal spaces behind the angles of the ribs is the best method for the majority of cases. General anesthesia may be used with care when needed. A localizing x ray examination should be made before operation where possible. The principles of operation should include the complete excision of the entrance and exit wounds in the chest wall with removal of all fragments of broken rib. If there is collapse of the lung and hemothorax the pleural cavity should be wiped out. The foreign body should be found by inspection or palpation and removed, even if this requires the enlargement of the wound. When the body is embedded in the marginal portion of the lung it is often best to excise the damaged part of the organ and suture the fresh wound. When the pleural cavity is properly cleaned and hemorrhage has been controlled antiseptics such as flavine or brilliant green solutions may be used, but their value has not yet been determined. The opening in the chest wall should then be closed by suture of the pleura, if possible, followed by separate suture of the muscular and skin layer. Where the pleura cannot be sutured a muscle flap may be used to close the opening. Just before the placing of the last stitch and its tying the patient should be made to empty the pleural cavity of as much air as possible by forcible attempts at expiration while the glottis is closed. The practice of these principles of treatment in a considerable series of very severe wounds led to the saving of a large proportion of cases and rapid improvement in many others which would have progressed but slowly to ultimate recovery.

Use of Commercial Javel Solution in the Treatment of Infected Wounds.—Cazin and Krongold (*Presse médicale*, November 1, 1917) believe it a mistake to assume that diluted Javel solution cannot, because of irritant properties, be used in the treatment of infected wounds. Experiments with human skin showed that when the tissues are placed twenty-four hours in a 15:1,000 dilution of Javel solution, they remain histologically normal. If, on the other hand, skin tissue is placed in Dakin's solution, in Daufresne's surgical sodium hypochlorite solution, or in a Javel solution of such dilution as to contain the same amount of sodium hypochlorite as Daufresne's solution, viz., 0.5 per cent., microscopic examination after twenty-four hours reveals complete destruction of the epidermis and dermopapillary layer, as well as necrosis and partial dissociation of the connective tissue bundles of the dermis. The 1.5 per cent. dilution of Javel solution employed by the authors contains only 0.042 per cent. of sodium hypochlorite, twelve times less than the Dakin or Daufresne solutions. It was used in the treatment of 510 cases of infected wound, comprising 155 compound fractures, 286 deep wounds of the soft tissues, generally extensive; forty-four suppurating cases of amputation near the front, and twenty-five cases of multiple severe wounds of soft tissues. In the entire series there were but three deaths, including one from tetanus and one from grave icterus. The diluted Javel solution is stated to have shown greater bactericidal power than Dakin's solution without its irritating property, the latter apparently being due to an excessive content of hypochlorite.

Ophthalmic Syphilis.—A. Poulard (*Presse médicale*, November 15, 1917) refers to the paramount necessity of immediate treatment in syphilitic ocular involvements, in view of the rapidity with which irreparable injury to vision may be caused by the disease. For the first three days, beginning at the initial visit, he injects cyanide of mercury daily in the dose 0.01 gram. Subsequently the same dose is given on alternate days. The injections may be either subcutaneous or intravenous. In the first method, he uses a one per cent. solution of the mercurial in distilled water, with 1:200 cocaine hydrochloride added. This is injected in the buttock with a needle four centimetres long, inserted perpendicularly. For intravenous injection a solution of the same strength is used, but without the cocaine. With equal dosage, the results are practically the same by the two methods. If, in a severe involvement threatening vision—iritis or choroiditis—the condition is not checked or even in retrogression after seven or eight days' treatment, novarsenobenzol should be administered in addition. Intravenously, 0.15 gram is given as the initial dose, followed in a week by 0.3 gram, next by 0.45, then by six successive weekly injections of 0.6 gram. Poulard believes it a mistake to abandon the subcutaneous route, and often injects 0.1 gram of novarsenobenzol in two mils of sterile water under the skin of the buttock at two adjoining points. Such an injection is made every other day, or daily; sometimes 0.15 gram every day is given. In affections of the iris and cornea, instillations of novar-

senobenzol are often practised in addition; three or four instillations at a time or administered within ten minutes after preparation of the solution. In grave forms of iritis, the writer has also given subconjunctival injections of novarsenobenzol of one per cent. strength. For instillation, even a ten per cent. solution is painless and harmless. Mercury is used in the beginning of the treatment because it is less irregular in its effects than the arsenical. The latter, however, will often cure certain conditions rebellious to mercury, e. g., bone lesions of the orbit. Especially to be avoided is the substitution of only moderately powerful salts of mercury, such as enesol or the benzoate, even in double the amount, for mercury cyanide.

Meats in the Diet of Diabetics.—Nigay (*Journal de médecine de Paris*, October, 1917) points out that many diabetics, finding themselves deprived of starches and sugars, resort to meats as a means of appeasing their hunger, and consume large quantities thereof, according to their respective appetites. Such a habit presents serious disadvantages in that the proteins and nucleoproteins, abundantly present in meats, increase intestinal putrefaction, fatigue the liver and kidneys, promote arteriosclerosis, and also provoke acidosis, as shown by an excess of ammonia in the urine and the appearance of acetone bodies. Control of the diabetic patient in this direction may therefore be required. The best guide to the amount of meat permissible is afforded by estimations of the urea elimination in the urine. Where the urea is below or equals 0.4 gram per kilogram of body weight, a generous meat ration may be allowed, e. g., 300 grams a day for a patient weighing sixty kilograms. If, on the other hand, the urea exceeds the figure mentioned, the meat ration should be reduced and that of fats correspondingly increased. Age and season should, in general, also be taken into account in deciding on the meat allowance, less meat being indicated in the elderly than in the young and in summer than in winter.

Eczema in Childhood.—Charles J. White (*Boston Medical and Surgical Journal*, January 3, 1918) says that at the end of three years of concentration on the subject of eczema he feels justified in drawing the following conclusions: 1. There are two great types of eczema, those curable in the hands of an expert and those which are not; these two classes cannot be distinguished objectively. 2. Crude coal tar when properly used is curative in most cases of moist eczema and has proved of inestimable value. 3. Eczematous individuals, both young and old, react positively in decided numbers to food tests and stool examinations; hence food plays some rôle in the abnormal composition of individuals afflicted with chronic, rebellious eczema. 4. Proper feeding, as indicated by food tests and stool examinations, is capable in very young children, who eat elemental food, of producing a cure, or of paving the way for a cure in a decided majority of cases. 5. In older children and adults such success has been obtained in only a small minority, but possibly this failure is due less to the value of this knowledge than to the fact that the food of these patients is practically always a complex substance and so incapable of such scientific and exact preparation.

Röntgenization of the Thymus Gland in Graves's Disease.—Charles A. Waters (*American Journal of Röntgenology*, November, 1917) reports his observations on ninety-nine cases of exophthalmic goitre treated by röntgenizing the thymus alone. Of these ninety-nine cases, seventeen were irradiated before operation, thirty-four following operation, six were irradiated both before and after operation, while thirty-eight received irradiation without any surgical interference. In fifty-two cases partial or complete lobectomy was done, while in eleven only one or more thyroid arteries were ligated. The treatments were given in series which consisted of a full erythema dose given through six portals of entry over the upper anterior mediastinum in the region of the thymus gland. A few of the earliest cases received one exposure a day, while the majority received complete irradiation at one séance, which consisted of a six minute exposure with a seven inch spark gap, five milliamperes passing through the tube filtered through one millimetre of aluminum at a focal distance of twenty centimetres. Blood counts were frequently taken after the treatment. After a few days and in some cases after a few hours, the differential blood count would begin to show a polymorphonuclear increase with a mononuclear decrease. The change would progress for several days up to several weeks, when the count would return to normal, and after a period of two or three months no relationship could be attached to the blood picture and the state of hyperthyroidism. As a result of his treatment of these ninety-nine cases he concludes that there has been undoubted subjective improvement but without a disappearance of the cardinal objective signs of exophthalmic goitre.

Diseases of the Gallbladder.—Charles R. Sower (*Journal of the Indiana State Medical Association*, December 15, 1917) believes that the great majority of acute low grade inflammatory conditions of the gallbladder go untreated, the symptoms not being severe enough to cause the patient to seek medical help, and sometimes not severe enough to cause the doctor to suspect the nature of the trouble. In cases that seek relief rest in bed is the first essential. Gentle laxatives, such as petroleum or olive oil or a low enema, may be given, but drastic physics, especially calomel, are warned against, as many cases are made worse by their injudicious use. Pain and distress should be allayed without resorting to opiates. If the latter become necessary small doses of codeine are preferred. Morphine may mask a rapidly developing phlegmonous or gangrenous bladder or a possible rupture, until too late for efficient relief. We had best depend on hot moist packs, or the icebag, although the latter is apt to obtund the local area so that we may be unable to localize tender areas; this, however, may be overcome by a hot moist pack applied for a few minutes before examination. Hexamethylamin should be given in divided doses, twenty to thirty grains daily, alkaline waters administered in copious quantities, normal salt solution by bowel if the stomach will not tolerate liquids. The leucocyte count should be taken daily, and any considerable increase over normal should cause us to call in surgical aid.

Typhoid Fever.—Lucien F. Salomon (*New Orleans Medical and Surgical Journal*, December, 1917) lays particular stress upon intestinal rest and the influence of arsenite of copper. He asserts that he has treated 186 cases without a death and without tympanites, hemorrhage, or complication of any kind. Given a case of typhoid fever seen early in the course of the disease, the treatment consists first in cleaning out the intestinal tract by a brisk saline purgative; after that the administration of arsenite of copper, 0.01 to 0.02 grain, every three hours, a saline enema daily, and a readily assimilable liquid diet. He does not use tablets or tablet triturates of the drug, but the pure arsenite of copper suspended in distilled water. The directions for preparing are that the drug shall be well triturated in a mortar before water is added; it will then be found that the finely triturated salt when mixed with water will be in the form of a flocculent deposit, which upon shaking the bottle will remain in suspension long enough to be susceptible of equal division and accurate dose. One half grain to six ounces of distilled water will give each teaspoonful one ninety-sixth of a grain, which is administered every three hours. The so called antipyretics are depressant and do more harm than good. When the temperature needs to be reduced sponging with tepid water and alcohol will give the desired results.

Wounds of Large Vessels at the Base of the Neck.—G. Métivet (*Paris médical*, November 24, 1917) reports a case of laceration of the right subclavian artery by a shell fragment, with ligation of the vessel within the scaleni and recovery. Anesthesia proved unnecessary in this operation. The author lays stress on two special difficulties in such procedures at the base of the neck, the first being the cramping of the field of operation by the clavicle and the left hand compressing the bleeding vessel; the second, the necessity of operating with one hand, help from an assistant being out of the question because of lack of room. A triangular flap, with the base outward, should be employed in exposing the site of injury. A silk thread should next be passed beneath the middle of the clavicle, to permit of prompt use of the Gigli saw in case it should prove essential to sever this bone to expose the vessel. The carotid artery may then be uncovered and examined, and after the subclavian vessels, outside of the scalene muscles. Finally, the lower attachments of the sternomastoid may be cut, to expose the first part of the subclavian artery, its branches, and the junction of the subclavian and jugular veins. As soon as blood spurts from the deep tissues the left index finger should exert pressure on the injured vessel. An attempt should then be made to free this vessel, in order to be able to substitute a bulldog clamp for the digital pressure. Where neither clamp nor ligature can be applied, the clavicle should be sawed through by the assistant, a deep skin and muscle incision made down toward the axilla, the internal segment of the clavicle disarticulated, a large osteoplastic flap corresponding to the lines of incision turned outward and downward, and the ligation of the injured vessel, thus facilitated by the ample exposure afforded, proceeded with.

Serum Treatment of Typhus Fever.—A. Orti-coni (*Bulletins et mémoires de la Société médicale des hôpitaux de Paris*, July 12, 1917) found that serum from typhus convalescents, obtained between the sixth and the twelfth days after subsidence of temperature and administered to patients by subarachnoid injection, exerts a very distinct favorable action on the general condition, the nervous manifestations, and the pulse, at whatever stage of the disease it is employed. The pulse becomes regular and slower in rate, delirium is markedly or completely allayed, and apathy, where present, is overcome. When the injections are administered in the terminal stage of the disease, in the presence of hypothermia, temporary betterment occurs, though the course of the disease is apparently unchanged. In six grave cases the injections were followed by marked general improvement, disappearance of facial and conjunctival congestion, and cessation of fever on the fifteenth or sixteenth day. Two patients treated by simple lumbar puncture died without exhibiting any signs of improvement. The best method of administering the serum appears to be to give injections of twenty to twenty-five mls each at twenty-four hour intervals. In early cases, where nervous manifestations have not yet appeared, the treatment seems capable of preventing their subsequent occurrence, or at least, of promoting sleep.

Cardiospasm in Infancy and Its Treatment.—Le Grand Kerr (*Archives of Diagnosis*, July, 1917) reports eleven cases of this condition. In seven, an intercurrent disease preceded an apparent aggravation of the symptoms attributed to the nutritional fault. In the remaining four, there was no intercurrent disease, but each patient exhibited considerable evidence of rickets. All the cases presented the following features: 1, vomiting of unchanged milk in very small amounts; 2, vomiting always immediately preceded by a sudden, sharp cry or other evidence of distress; 3, no change in the diet preceded the vomiting; 4, no apparent physical change in the infant for a considerable time before the vomiting. Taken together, these features suggest independence of the vomiting and the composition of the food. In some instances, after a period of persistence, the baby was able to retain food, with discomfort or further interference with nutrition. The positive diagnosis was made with the stomach tube, the progress of which was arrested at the cardia. Treatment gave uniformly good results. For two weeks the baby must be kept in a quiet room, well ventilated, with one attendant and no visitors or family. The legs of the chair should be cushioned and the attendant's feet slipped. The food should be sufficient for the individual infant's needs, but if possible its bulk should be reduced. The hours of feedings should be lengthened whenever practicable. It is sometimes advisable to give a food that is partly predigested. Extremes in the temperature of the food must be avoided. Beef blood or fruit juices must be temporarily discontinued. For fifteen minutes before and after, as well as during, feeding the room should be somewhat darkened. In rebellious cases one may begin the feeding with a medicine dropper or special feeder for premature infants. The bromides and belladonna, judiciously given, are valuable adjuncts.

Vincent's Angina.—Thomas Hubbard (*The Laryngoscope*, November, 1917) emphasizes the importance of a thorough laboratory study of all ulcers and false membranes for the purpose of differentiating diphtheria, syphilis, and Vincent's angina. The fact that the appearance of a throat ulcer suggests a specific lesion and clears up under the administration of salvarsan does not necessarily eliminate the diagnosis of Vincent's angina. Spirillar infections are common in the mouth and throat and there are undoubtedly different types varying in pathological virulence. The most effective local treatment of Vincent's angina so far suggested is the use of powdered sodium perborate rubbed into the crypts and necrotic tissue, a saline gargle to remove the debris, and swabbing with extraordinary care all recesses with glycerole of iodine—iodide of zinc, two; iodine, three; distilled water, five; glycerin, ten. If prompt relief is not obtained, a hypodermic injection of cacodylate of sodium, 2.5 to five grains, is administered and repeated in twenty-four hours if the kidneys are not affected. If the case suggests a malignant type and improvement is not forthcoming following the above treatments, intravenous injection of neosalvarsan should be resorted to.

Possibilities of Curative Treatment in Tuberculosis of the Kidney.—Noël Hallé (*Presse médicale*, November 8, 1917) deems it a mistake to argue for or against either medical or surgical treatment as an exclusive form of management in renal tuberculosis. The cases of this disease should be divided, according to their clinical features, into groups, and the relative indications for medical and surgical measures in each may then be appropriately discussed. Surgical treatment is generally indicated in cases of the open, pyelitic type. In the severe, rapidly progressing cases it is strongly indicated, and should be performed early, though not hastily, i. e., after a short period of observation and the failure of medical treatment have led to an unfavorable prognosis. In milder, slower cases of the open type, operation is only in a relative degree indicated. Provided the patient is watched and cared for, time may be given for spontaneous recovery; but one should remain ready to intervene in case the condition grows worse. In closed parenchymatous renal tuberculosis, on the other hand, surgical treatment is contraindicated. Total nephrectomy is at present the only certain method of surgical treatment. Partial nephrectomy is rationally applicable in single, polar or lobar, closed lesions, but these are hard to recognize and are recovered from spontaneously. Prompt medical treatment is indicated in cases suspicious because of the antecedents and the minor signs of nephritis; such cases of latent, closed renal tuberculosis might be cured before they become complicated with open pyelitic lesions. Medical treatment is also indicated in mild, slow cases of open tuberculosis, where the general condition is good; likewise, in operable cases in which operation is refused and in bilateral cases with a poor general condition contraindicating operation. In none of its aspects should renal tuberculosis be considered entirely incurable. By hygienic and pharmaceutical means, medical treatment is already yielding noteworthy results.

Miscellany from Home and Foreign Journals

Ventricular Fibrillation in Man, with Cardiac Recovery.—G. Canby Robinson and J. F. Bredeck (*Archives of Internal Medicine*, November, 1917) refer to a generally accepted view that when the ventricles of the human heart pass into a state of fibrillation, death is an almost immediate and invariable consequence. In the case they report, a woman, aged forty-five years, with long standing fibrous endocarditis showed marked cardiac insufficiency and had three attacks of cardiac syncope. During one of these, an electrocardiogram typical of ventricular fibrillation was obtained. The patient living thirty hours after this attack, numerous additional electrocardiograms were obtained. One taken just after intravenous strophanthin injection showed a derangement of the cardiac mechanism similar to that observed experimentally by Levy and Lewis during the condition known as potential fibrillation. The abnormal ventricular complexes in the electrocardiogram, which occurred frequently, indicated a derangement of intraventricular conductivity. This may have been the prime factor of the ventricular fibrillation. The authors warn that the occurrence, in an electrocardiogram, of ventricular complexes indicating derangement of intraventricular conductivity should be taken as a contraindication to the use of such drugs as chloroform, epinephrin, and strophanthin, which predispose the heart to ventricular fibrillation.

Examination of U. S. Soldiers for Tuberculosis.—Edward O. Otis (*Boston Medical and Surgical Journal*, January 10, 1918) presents the following general suggestive scheme for tuberculosis examinations when they can be made under more favorable auspices in a permanent camp and with sufficient time for leisurely work and observation: So far as possible only experienced experts should be employed; the technic of percussion and auscultation may be learned in an intensive course of instruction and more or less skill acquired, but judgment in making a correct interpretation of signs and symptoms comes only from long experience. Only a certain number of examinations should be made by the examiner in a day. After a period of time, differing with different examiners, spent continuously in percussion and auscultation, one becomes mentally weary, his ears dull of hearing, and his judgment uncertain. The place of examination should be such that comparative quiet can be maintained; one can make an examination under noisy conditions, but it is far more exhausting to the examiner and a certain amount of accuracy is likely to be sacrificed. A short history should be taken of each soldier, which can be done by an intelligent and honest noncommissioned officer according to a prepared schedule of which this questionnaire is an example: 1. Have you ever had pleurisy, pneumonia, typhoid fever, influenza, or any severe illness? 2. Did you ever spit up blood? 3. Have you been losing weight or strength recently? 4. Are you short of breath on exertion? 5. Have you a cough, and if so, how long has it lasted? 6. Are you subject to colds? 7. How is your appetite and

digestion? 8. Do you use alcohol? All suspicious cases should be deferred for a second examination and consultation, and then if doubt still exists the subject should be kept under observation for a period of time, or if an x ray outfit is at hand and a competent technician in charge, an x ray negative can be taken. It is a common experience that suspicious physical signs upon the first examination may, after a few days be found to have disappeared. When sputum is obtainable in a suspected case it should be examined, so a clinical laboratory should be at hand for this purpose as well as for other bacteriological examinations. All cases with any developmental defects of the chest, such as rickets, or with defective musculature should receive especial attention. In suspicious cases, particularly with a pulse above the normal, the temperature should be taken at stated periods for several days. All acute respiratory infections, such as bronchitis, influenza, and laryngitis, should be kept under observation in the hospital.

Functional Paralysis Due to Motor Inactivity.—P. Hartenberg (*Presse médicale*, November 15, 1917) recognizes among possible causes of motor impairments occurring in the absence of any apparent organic nervous lesions such factors as reflex action, sympathetic disturbances, hysteria, and perhaps unknown changes in the central nervous system. Recently he has seen occasion to lay especial stress on prolonged inactivity of a limb or limb segment or groups of muscles as a cause of functional paralysis. Usually this occurs when a limb has been immobilized for some time because of a wound, inflammatory process, fracture, or even a mere pain. The supporting apparatus having been taken off, the joints are found stiff, the muscles torpid, and all the tissues sensitive. In pusillanimous, lazy, aboulie, or obsessed individuals, the required efforts at mobilization are not made, and to the initial disturbance a paralysis through inactivity is thus superadded. Peripherally, such conditions as muscular atrophy with subnormal irritability to electric stimulation; decalcification of the bones, joint stiffness, hypothermia, cyanosis, hyperhydrosis, and hypesthesia become established. Where the limb is habitually held in a faulty position, permanent loss of dynamic equilibrium between opposing sets of muscles occurs, and joint movement is correspondingly restricted. Further, the nerves supplying the inactive muscles will lose their conductivity and the spinal motor centres become weakened, thus increasing the tendency to muscular atrophy. The cortical kinesthetic centres themselves become torpid, kinaesthesia and voluntary motion are impaired, and the affected limb practically passes from the consciousness of the patient, who carries the affected part around like a foreign body. Prophylaxis is based on the recognition that there is a critical time in such cases, at which the management of the patient governs the ultimate result. At this time prompt and energetic treatment, if necessary reinforced by disciplinary measures, will sometimes have to be resorted to if the morbid trend is to be avoided.

Ulcerative Mycosis of the Penis.—E. Mallien (*Revue des maladies de la Société médicale de la ville de Paris*, July 12, 1917) reports the case of a soldier with an ulcer on the prepuce, received with a preliminary diagnosis of syphilitic chancre. The ulcer, situated two centimetres from the preputial orifice, was nearly one centimetre in its broadest diameter but of irregular shape. Its base was yellowish, with but little discharge, and the margins were sharp and slightly raised. Palpation revealed some induration of these margins, but the lesion as a whole was soft. There was slight edema of the prepuce and a single enlarged lymph node. The diagnosis was changed to a tertiary chancroidal syphilide, the patient admitting gonorrhoea three years before, with small fissures on the penis. The Wassermann was repeatedly negative. Injections of neosalvarsan yielded no results. Tuberculosis was then thought of, but guinea pig inoculation was negative. Smears showed merely staphylococci. Tube cultures, however, yielded a fungus. Actinomycosis being excluded by the lack of induration of the sore, sporotrichosis was suspected and iodide treatment instituted, the lesion then rapidly disappearing. Spores being noted in the cultures, sporoglutination was tried, but with no result. The Bordet-Gengou fixation reaction, however, was clearly positive. Morphologically, the true sporotrichosis of De Beurmman and Gougerot could be eliminated. Further study showed that the organism presented all the characteristics of *Oidium cutaneum*, described by the same observers as the cause of disseminated ulcerative skin lesions. Such cases stimulate both syphilis and sporotrichosis.

Brachial Neuritis and Sciatica.—Hugh T. Patrick (*Journal A. M. A.*, December 29, 1917) contends that there is a general misapprehension as to the frequency of neuritis of the brachial and sciatic nerves, and that not more than about one patient in ten believed to have one or the other of these forms of neuritis really has an involvement of the nerves. In the vast majority of the cases of supposed brachial neuritis or sciatica the true condition is an arthritis or less frequently some other lesion such as bursitis, neoplasm, or syphilis. The reason for this misunderstanding of the true condition in these cases is mainly the failure of the physician to make a proper and thorough examination. The occurrence of muscular wasting is also commonly taken as a sign of neuritis and it is not recognized that it is a common accompaniment of arthritis. The pain in true neuritis is constant and is not much affected by active or passive movement. The suffering is usually intense, there is usually exquisite tenderness of the affected nerves, the deep reflexes are diminished or absent, the disease is selflimited, usually it lasts for not over a few weeks to a few months, recovery is definite, and recurrence is rare. In arthritis, on the other hand, the pain is seldom so severe, it fluctuates in intensity, is often intermittent, is commonly affected by the weather, is frequently worst at night, is seldom sharply localized, and is greatly influenced by passive motion. Careful examination will always show in arthritis that there are certain movements which are painful. These movements are not by any means the

same for a given joint in all cases, but some are fairly characteristically painful. When the arthritis is in the shoulder abduction of the humerus with retraction and internal rotation, as in crossing the arm behind the back, is very commonly painful. In the case of the hip the commonest cause of pain is flexion, abduction, external rotation, and extension of the thigh. Pain on such movement is called the "fabere" sign, from the abbreviations of the names of the movements eliciting it. Other movements than these should be tried, actively, passively, and against resistance before excluding the presence of arthritis. Arthritis also is commonly associated with two other signs which serve to differentiate it from neuritis, namely, fever and leucocytosis. Both are usually of very low grade and in mild and chronic cases may be absent.

Weber's Syndrome.—G. B. Hassin (*Journal A. M. A.*, December 29, 1917) defines Weber's syndrome as a partial or complete paralysis of one oculomotor nerve with a contralateral hemiplegia and is indicative of a lesion of the cerebral peduncles. Its practical significance lies in its precise localization of the brain lesion producing it. Relatively few pathological reports have been made of cases showing this syndrome and the author adds one of his own observation. The patient was a girl nine years old in whom complete paralysis of the left oculomotor developed along with a complete right hemiplegia. The hemiplegic side showed exaggerated reflexes, positive Babinski, Chaddock and Oppenheim signs, and a negative Gordon reflex. The left side was normal and sensation was not disturbed on either side. At autopsy an extensive glioma was found to have completely destroyed the left hippocampal gyrus, the cornu ammonis, the cerebral peduncle, and the left oculomotor nerve, and had spread so as to involve the tegmentum, part of the optic thalamus, the pons, and the medulla.

Determination of Types of Pneumococcus.—O. T. Avery (*Journal A. M. A.*, January 5, 1918) points out the fact that the present marked shortage of mice has greatly interfered with the determination of the type of pneumococcus in cases of pneumonia, since this animal was employed for the ready isolation of the organism from sputum. A method is reported by which the isolation can be made quite readily and rapidly through cultural means. It consists briefly in washing the selected lump of sputum in normal, sterile saline, emulsification with 0.5 to one mil of broth, and addition of the emulsion to four mils of specially prepared glucose blood broth. This is incubated for five hours in a water bath at 37° C., centrifuged slowly to throw down the red cells, and one loopful is inoculated on a blood agar plate. The remainder of the supernatant fluid after centrifugation is pipetted into a centrifuge tube containing one mil of sterile ox bile so as to dissolve the contained pneumococci while not affecting the few other types of organisms which may be present. After twenty minutes of incubation of this tube it is centrifuged at high speed to throw down contaminating organisms and the supernatant fluid is used for the identifying precipitin tests. When run in parallel with the mouse method this new method has given uniformly concordant results.

Sensitization of Hay Fever and Asthma Patients.—I. C. Walker and June Adkinson (*Journal of Medical Research*, November, 1917) in this work find that patients who are extremely sensitive to the pollen of ragweed may or may not be sensitive to the proteins from other parts of the plant, and that the pollen, rather than any other part of the plant, must be used for testing and desensitizing purposes; also that the pollen is the only part of the plant which causes hay fever and asthma. Patients who are sensitive to corn pollen and its proteins may or may not be sensitive to the proteins of corn seed, and patients who are sensitive to the proteins of corn seed may or may not be sensitive to the proteins of corn pollen. The sensitization of patients to the individual proteins of each cereal, and to the similar proteins in the different cereals, varies. The skin test appears to be a means of separating very closely related proteins, when such means as chemical and physical properties fail to do so.

Effects of Nerve Ischemia in Wounds of Arteries.—Desplats, Buquet, and Pozzi (*Presse médicale*, November 1, 1917) have been led to recognize, as a possible result of traumatic obliteration of the main artery to a limb, the appearance in the ischemic region of nervous disturbances soon after the injury, these disturbances being due to the lack of circulation and progressing until the blood supply has nearly or quite returned to normal. In five cases following ligation of a wounded axillary artery, three types of nervous disturbance were noticed: 1. Paralysis of the terminal type, with reaction of degeneration. In all these cases the terminal portions of the ulnar and median nerves were paralyzed, causing paralysis and atrophy of the muscles of the hand; the radial distribution was also peripherally involved. In three cases the musculocutaneous nerve and biceps muscle were likewise affected. In three cases, too, the ulnar and median neuritis extended up to the forearm, being, however, less marked above than lower down. 2. Anesthesia of the hand, most marked at the finger tips and diminishing proximally. 3. Fusiform deformity of the fingers, evidently of trophic origin. In cases with a less persistent or less complete ischemia, milder nerve disturbances were noted. These included trophic, sensory, and motor abnormalities, more common in the upper than in the lower extremity, and slight atrophy of the limb, partly masked by edema, the latter most pronounced peripherally. The sensory disturbances were terminal and relatively slight, but the motor phenomena were more pronounced than the atrophy might have suggested, amounting sometimes to complete paralysis. The nerves showed loss of direct irritability but not of conductivity. The pathogenesis of these ischemic nerve manifestations is apparently very similar to that generally accepted in the case of the cerebral cortex and to that recognized by ophthalmologists in the case of the optic nerve from thrombosis or embolism of the central retinal artery. The authors recall the experimental observations of Lapinski to the effect that, upon aseptic ligation of the main artery to the posterior extremity, the various stages of degeneration of nerves in their peripheral portions follow, through parenchymatous neuritis.

Synesthesalgic Disturbances in Causalgia Following Traumatism.—Tinel (*Presse médicale*, November 29, 1917) observed in one half the cases of causalgia seen by him the presence of an area of the wounded arm in which deep pinching of the skin brought on an attack of pain in the corresponding hand. The area was at all times the same in a given subject but varied in location in different individuals. In causalgia of the median nerve, the field of synesthesalgic provocation was frequently at the outer border of the arm; in that of the ulnar, at the inner border, and in that of the brachial plexus, over the entire upper extremity except on the inner aspect of the arm. At times the area extended over the whole body, the phenomenon being more marked, however, on the side of the injured arm. As the causalgic manifestations recurred, the synesthesalgic area became reduced in size to scattered patches. That the synesthesalgia is of sympathetic origin is considered proved by the presence of vasomotor and secretory disturbances in situations other than the seat of pain and by the observation in one case of a dilated pupil on the side of the injury during an attack of causalgia. The starting point of the entire causalgic complex is not always in the nerve wound itself, for section of the nerve above the level of the wound does not always completely relieve the causalgic disturbances. The probable existence of collateral sympathetic pathways coursing through the arterial or even the venous sheaths and joined by anastomoses at various levels must therefore be recognized.

Diagnosis in Back Lesions.—James Warren Sever (*Boston Medical and Surgical Journal*, December 20, 1917) discusses a number of cases that showed fractures of one or more vertebrae which had escaped notice and therefore had not been treated. He says that compression fracture of one or more vertebral bodies is not uncommon, following falls on the feet or back or following the dropping of weight directly onto the flexed spine. The fracture is generally the result of forcible flexion of the spine, and usually there is no nerve involvement or cord pressure. The injury results in a weak, stiff, and painful back. The examination of any back case, especially following an injury, is always incomplete without a good x ray. Kyphos is usually present, but does not always appear at once. The disability for heavy work is usually permanent. In so far as the majority of cases is concerned, they go unrecognized as fractures of the vertebral bodies because of inadequate examination, and consequently continue to suffer pain and disability, which is real and not feigned. No individual who complains of pain, soreness, or stiffness in the back, following an injury or a fall, should go without careful examination of the back. The bony repair is generally good, and, although there may be a persistent stiffness, the same is true of the supporting function of the spine, even in spite of a kyphos which may tend to increase somewhat. Permanent disability, so far as doing heavy, laborious work goes, generally follows such an injury, and as a rule a light back brace is needed for some time or always to give comfort and stability. The prognosis, so far as life is concerned, is excellent, provided that the cord has not been injured.

Proceedings of National and Local Societies

THE NEW YORK ACADEMY OF MEDICINE.

Stated Meeting Held November 1, 1917.

The President, Dr. WALTER B. JAMES, in the Chair.

The Study of the Juvenile Delinquent.—Dr. WILLIAM HEALY, of the Judge Baker Foundation, Boston, delivered an informal address, confining the subject to the results being accomplished by the study and the reasons for its institution. These points were illustrated with a few case reports. The study was undertaken from the psychological standpoint of the conduct of a number of antisocial individuals because it seemed to be desperately needed. Ten years ago it had been discovered what an enormous amount of work there was to be done along these lines. All thinking people, judges and university professors among them, were interested in the study of the criminal. The speaker had shared this interest because from the cases seen in the prison clinics he felt that there was an unknown amount of mental defects which caused conduct disorders; not being recognized in time for what they were, they undoubtedly very frequently led to actual prison offenses. If these causes were understood early enough, the apparently inevitable careers of such individuals might be diverted.

In order to approach the problem properly a study was undertaken of offenders as they appeared in court, although a few individuals were singled out before reaching such a pass, being brought to attention by teachers and parents. There was no doubt that the courts were unable to handle properly and efficiently the individual cases of juvenile offenders. In the *British Medical Journal* of 1903 or 1904 there was a statement to the effect that of 186,000 convicts in the English prisons, 100,000 had been convicted before. The same or very nearly the same proportion existed in this country, though unfortunately there were at present no national statistics to prove it. The statistics at Sing Sing prison showed that sixty per cent. were recidivists.

There was at present among those in authority a marked incapacity for dealing successfully with cases of misconduct. Study was being concentrated largely on the juvenile offender in the hope of ameliorating this state of affairs. In the first place the juvenile offender could be approached earlier in his career and it was possible to ascertain more with reference to his home environment, his development, and his heredity. A second reason was because nearly all professional criminals had entered upon their careers during childhood or early adolescence. An interesting fact in this connection was brought out by Doctor Glueck in his researches into the life history of criminals; it showed that a large percentage of criminals had apparently been predestined to a life of crime from their earliest years. In the third place the young offender had been studied because more could be done for him by directing him and giving him a favorable environment through which he might be benefited physically and mentally and thus be less

crippled to face the realities and responsibilities of life.

The mental life of the young offender was of particular interest because back of this might be found the most frequent cause of misconduct as, of course, of conduct in general. Only a very short time ago the criminal had been studied from the standpoint of physical abnormalities, such as length of ear, cephalic indices, etc., but the study of the mental makeup and the personality of the misdoer was now being approached with all the available tools of psychology, not psychiatry for it was not a fact that the average individual guilty of misconduct was mentally diseased. The psychiatrist dealt with definite disease entities and out and out defectives and many of these cases came within his scope, but there were many others in whom the mentality could not be regarded as diseased. Studying the subject's mental imagery, one would find that the individual held in his mind certain definite pictures of conduct, certain ideals of things to be reached out for; as a result he had certain impulsions or obsessions based on his mental imagery. Again, an individual might have certain abilities which, denied ordinary and legitimate satisfaction, led to a mental maladjustment and misconduct. These might affect his relations with his family, his school life, or the outside world and society in general. These points were not dealt with in the textbooks on psychiatry or psychology and yet they were causative factors in misconduct; they held definite relations in the conditions of life of every one, standing back of all impulsions and conduct. Study of the juvenile offender from the standpoint of psychology sought a practical way to help the individual in his particular trouble with the world. The physical makeup was studied, not because they wished to discover how many cases of, for instance, heart disease or tuberculosis existed among this class of individuals, but because of the bearing of the physical makeup on the mental life. In the same way the environment was studied because insanitary conditions, adult example, insufficient food, etc., might affect the conduct of the boy at school. A very definite factor in the career of youthful offenders against the law was the psychological environment of the institution to which he was committed. This had a definite bearing on his future career, certainly when young, very probably when older. This could easily be brought out by a little probing into the mental life of the criminal. Havelock Ellis gave a striking illustration of this in his *Memoirs of an Australian Criminal*.

Another point that was being carefully studied was heredity, from the standpoint of both medicine and psychology, focussing on what lay directly at the basis of misconduct. An inherited tendency toward mechanics for want of a proper outlet had led to burglary; the finding of facts of this sort led to therapeutic measures. A great deal could be done in this direction along constructive lines, but this meant the individual study of thousands of cases for of course many could not be readjusted. These

juvenile delinquents were of no one type and there was no one set method of examination. This study was simply the beginning of handling a tremendous human problem that was of vast importance to society with great possibilities for the future and offering great rewards in scientific understanding, not alone from the pathological side, but in the better comprehension of ways for developing the potentialities of normal individuals.

The Study of the Prison Inmate.—Dr. BERNARD GLUECK, chief of the Psychiatric Clinic at Sing Sing, reviewed the work so far done at the prison in searching for the causes of criminal conduct, illustrating his address with charts and statistics which showed that the subject had been studied with the most painstaking care. He considered it a privilege to listen to Doctor Healy's very interesting address, particularly because it gave him a little optimism much needed after a year or two spent in an institution like Sing Sing. He did not disagree with Doctor Healy in the hope of reconstructing the lives of these people, for he had seen wonderful results accomplished along this line, but one became discouraged about the situation as a whole after seeing case after case committed to prison with such terribly bad careers back of them and coming from such bad environments, there being so little opportunity to handle them individually or to study them singly.

When the psychiatric clinic was established at Sing Sing, it was not entirely clear how far its possibilities could be developed; but it was felt that the clinic ought to be of some help to the administration if a definition of each individual delinquent could be furnished and a clear outline made of the forces that had been at work in making the criminal what he was on his admission to prison. It was felt that such an approach ought to point out a more successful attack of the problem in individual cases. So the primary function of the clinic was that of definition. The personnel had gone there expecting contact with people suffering from abnormalities of a mental nature and, in the understanding of these, had hoped to be of assistance to the institution. There was much agitation about prison reform, but those concerned in it often had no conception of the difficulties of prison management itself and the attaining of better conditions. Many prisoners had been handled in all sorts of ways with the idea of accomplishing their reform and had been given up as hopeless. Then they were sent to Sing Sing. It was to be expected that the average prison would turn out better men than those that came to it, but the men in charge of the prisoners knew the difficulties in the way of accomplishing this, though they were enthusiastic for success. The community outside, however, that provided the facilities seemed indifferent to the actual facts, but the clinic continued to hope to be of assistance to the prison administration in helping to turn out better men than came in. There was also some hope of trying to change the mental attitude of the prisoners toward life in general, but that was a matter for individual therapy. The question was: What could be done to give them a different outlook on life especially after leaving the prison?

The charts showed that the effort at definition had been successful to some extent. The conditions that were found were surprising. Of course, these conditions were not general throughout the country; in Sing Sing one was dealing with a highly specialized group of people. Doctor Healy saw many cases in the beginning of their antisocial careers while at Sing Sing one found largely end results. They could not be compared because no matter how many forces were at work in the beginning, long criminal careers served to deteriorate them and their mental condition was a very hard thing to change. Doctor Healy spoke of physical conditions leading to abnormal mental states. As far as the physical plant was concerned, the conditions at Sing Sing now were not of the best; the place had been in existence for over 100 years, and no matter how everybody tried to utilize the clinic, its recommendations, particularly along the lines of industry, could not always be followed. Under other conditions, the clinic could undoubtedly be of some aid in discovering the special aptitude of individual prisoners and so assist in placing them in more appropriate occupations than they followed at present. Time ought not to be wasted in trying to educate prisoners to do set tasks, for they were not educable and no progress could be made in certain cases. The clinic hoped to be of more use in this direction, however, when the new prison was built.

As far as having been of benefit to the individual prisoner, the speaker wished he could be more optimistic, though he did not believe there would be so much cause for discouragement under better prison conditions. If when the man left the prison he had opportunity to consult some one who knew his case thoroughly when he came to stressful points in his life, conflicts with the law might be prevented in many instances. If the clinic could be put at the disposal of discharged prisoners they could be helped in many instances. This was also a possibility of the new prison, the erection of which was being planned by the New York State Commission on New Prisons. If the clinic continued to meet with the cooperation it had received from the prison people, even more useful work would be done in the future than had been done in the past.

The Honorable GEORGE W. WICKERSHAM, opening the discussion, felt, through his intense interest in the subject of human justice, encouraged by the progress of the last few years in the study of the criminal through psychiatry because it was a scientific method of procedure; it was based on the relentless investigation of facts. Doctor Glueck's charts were extremely suggestive; they indicated a method of procedure which afforded a basis of approach to a more sound administration of justice. They were, however, not to be relied upon wholly, for Doctor Glueck had been dealing, as he said himself, with a highly selected group at Sing Sing, such a population as was not to be found anywhere else in the United States. Until a similar study had been made, therefore, of other groups all over the country for a period of years, a wholly reliable basis for the scientific deduction of facts would not be at hand. Certain things stood out, however, from

four studies and one of them was the matter of mental deterioration. Human justice in its ideal form reached out after a standard of divine justice as far as possible; it must know before it condemns. In the determination of the treatment of criminals the known mental condition of the offender should be the guide. The next step was the prevention and treatment of the malady.

Another prominent phase in these studies was the fact, as Judge Healy said, that the way of prevention lay in the study of children and in trying to supply them with the environment which they lacked at home to the end that they might be saved as assets to the state and protected from falling into the ways of crime. It was beginning to be realized how valuable to the State were the lives of its children and that no effort should be spared to protect them from contamination. Such statistics as were obtainable of what had been done in this direction were enormously encouraging and justified the State spending all or more than it was giving for the care of its children. It was very unlikely that much could be done in the way of therapy for old offenders. One suggestion had been inspired by the charts and that was that the mental development of the old offender showed his unfitness to live in society, and to turn him loose on the community would be to renew continually a menace to its welfare. In a measure this was met by the indeterminate sentence, but that was limited by the maximum limit, imposed because of the limitations of those in whom was vested the power of discharge. As appreciation grew of what an economic factor to the community was its freedom from criminals, men of higher type could be intrusted with the administration of criminal law and they would be given fuller power in dealing with offenders. This could not happen until the State was prepared to compensate properly the higher grade of men necessary for such confidence. Another point, and a startling one, was the large percentage of native born offenders shown in Doctor Glueck's charts. It was common for Americans to assume that the large number of criminals in a community was the result of the preponderance of the foreign born people; consequently it was humiliating to discover that the native born constituted the larger percentage of criminals at Sing Sing.

CHARLES BULKLEY HUBBELL, chairman of the New York State Commission on New Prisons, said that he had learned early in life not to dispute with the doctors; his father was one. So when the distinguished president of the Academy of Medicine asked him to take part in the discussion on the subject of the criminal from the point of view of modern psychiatry, like the invitation of royalty, he considered it a command. In extenuation of his appearance before an audience of medical experts, he stated that during his sixteen years of public life, the greatest contribution to what little success he had achieved came through his association with the doctors, first as president of the Board of Education in this city, where he appointed the first medical board to examine all applicants for positions as teachers, to exclude tuberculosis, etc.; during the first year of this regulation there was a diminution

of fifteen per cent. in the mortality of children of school age; second, as trustee in the State Hospital for Crippled Children, and now as a member of the new prisons commission which with the scientific contribution of the doctors was developing the new prison at Sing Sing.

The work was fascinating and interesting. When it was made clear that sixty per cent. of all the convicts of the State were men of feeble mind or mentally defective, and that the new Sing Sing was to be a classification prison and clearing house for all the criminals of the State, the first suggestion that occurred was the formation of a close alliance with the doctors and the first medical man selected as a member of the Medical Advisory Committee was the honored president of the Academy of Medicine who had contributed to the work ardor, self-sacrifice, and the most efficient service, attending all the meetings, carefully watching the development of the plans, and studying the blue prints as persistently as some men studied the plans for their country homes.

When the new prison was built, a definite advance would be attained in the character of penal institutions in point of scientific plan and maintenance. The conclusions from the charts and scientific methods established by Doctor Glueck were interesting and astonishing. It was largely the conclusions drawn from this work in his classification established by analytic and synthetic processes that led to the belief that the time spent on this prison commission was worth while. It could easily be understood that the building of a prison on the scientific lines indicated meant being familiar with the scientific principles that should govern its construction and arrangement. The commission had no delusions as to the abolishing of crime by any new methods of analysis, but it believed that these would tend to establish the boundary between the feeble-minded and mentally defective and the normal criminal, revealing the material with which the prison authorities would then have to deal. By the work of such a clearing house, these feeble-minded individuals would cease to travel in that vicious circle from the community to prison and from prison back to the community, some of them travelling that vicious circle almost all their lives. That class of the mentally defective prisoner would probably be permanently segregated and humanely treated, and society would be protected from their invasion. The work of redeeming the remaining forty per cent. of normal men through education, occupational and otherwise, would tend to make encouraging material for improvement. Such an outlook promised a betterment of the human race, for it was an interesting fact that in all English speaking countries almost the same percentage existed with reference to normal and subnormal criminals. In order successfully to treat the feeble-minded and subnormal, it was necessary to reach them when they were young, but the time was not far distant when every school would have its psychiatrist to study the conditions of mental hygiene and discover in time the arrested mental development of each child, in that way to protect society and help the unfortunate individual from going on

to a career of crime. Juvenile delinquency frequently developed through the secondary effect of what was regarded as initial vice; it was a noteworthy fact that the average convict grouped cigarettes, alcohol, and drugs together.

In the progress of civilization the tendency of mankind was to develop on the material side rather than through the development that came from introspection. One of the oldest Greek philosophers commanded his school, "Man, know thyself." Later on, Pope changed that sentiment not seriously when he declared that "The greatest study of mankind is man." A new development in the study of the treatment of human derelicts was approaching, quite as important in its relation to the human race as the invention of the submarine and the aeroplane was in the science of war.

Dr. AMOS P. SQUIRE, prison physician to Sing Sing, expressed his appreciation of the opportunity to state that he was in favor of and in sympathy with the study of the criminal from the point of view of psychiatry or any other agency which would give promise of lessening crime or improving the mental and physical condition of the criminal. This applied not only after he became a prisoner but more particularly before he was sentenced by the court. There were men now in prison for long terms whose mental condition made them more suitable inmates for an asylum.

No one could be at Sing Sing in an official capacity without being impressed by the fact that a large percentage of the prison population was below the average in mental and physical makeup. One was impressed more and more every day with the fact that the proper treatment of the criminal was a medical one, and the only hope of success lay in the careful, thorough, and systematic study of each individual case. It had been the custom at Sing Sing for some time to make a careful physical examination of each new admission and whenever an inmate was found to be suffering from any physical disability which could be corrected by surgical interference the condition was corrected at the earliest possible moment.

Although the speaker had not as yet seen what might be called a general criminal physique, he believed that there were physical conditions, peculiarities, and ailments that had a very direct bearing on the conduct of the prisoners or delinquents the correction of which not only tended to improve the prisoner's health but changed his mental attitude to a certain extent. Doctor Healy stated that physical conditions concerned with the causation of delinquent tendencies could be divided into those which caused weakness and those which caused irritation. There was no doubt that ocular ailments were a factor; eye strain or defective vision led to irritability and headache which had their influence on education and other activities. Carious teeth were a menace to the general health; those so affected were unable to masticate properly and there was constant absorption by the system of poisons due to decay. Adenoids, inflamed tonsils, and nasal obstructions were frequently the cause of physical weakness and general malaise. Syphilis was another condition whose importance in regard to this question was still

to be settled. The effect of alcohol and drugs on delinquents was well known; it appeared lately that more prisoners than ever suffered from a drug habit. These were a few of the physical conditions that existed at Sing Sing and when one reflected that the staff consisted of only one physician and his assistant, together with part time service of an oculist and a genitourinary specialist who spent a portion of one day a week gratuitously at the prison, it might readily be realized that the prisoners did not and could not receive the individual attention their physical needs required. This was no one man's job, but required the combined efforts of the best talent in all its branches. The best possible work was being done with the present facilities and staff, but all were looking forward to the new prison with its modern equipment and its various departments so that the work would be more coordinated and better results obtained.

Letters to the Editors.

D. D. S. REPLIES TO M. D.

1237 MAISON BLANCHE,
NEW ORLEANS, January 22, 1918.

To the Editors:

I trust that I shall be permitted to present these few remarks to your readers in reply to the letter of Dr. Rose Alexander Bowers, which appeared in your issue of November 17, 1917, and which has only very recently come under my observation. While there is much to condemn in Doctor Bowers's letter, this criticism will be confined only to several special statements contained therein.

She says: "Being a victim of the dentist's trade and not an occasional visitor, I have yet to see an instrument sterilizer, a scrub brush for aseptic purposes, or disinfecting solutions for the hands, even after the treatment of a patient with pyorrhea!" There is an old time adage, "A man is judged by the company he keeps," or words to that effect. Long since, I formulated another, "A woman is judged by the dentist she keeps." As in all other professions, so in dentistry there are good, bad, and indifferent men, and when Doctor Bowers has been a victim, and not an occasional one either, of studiously selected offices of the character she describes, the less said of her class of dentists the better.

It certainly would be a pleasure for me, and undoubtedly a treat to her, to be able to take her through the offices of many of my personal friends in various cities of the country, where she would see real first class offices equipped with sterilizers which are used, x ray machines which are used, microscopes, some with oil immersion lens, which are used—all of these the "real thing," no camouflage—and many other interesting objects pertaining to a modern dental practice, which would undoubtedly be a revelation to her, and for the advantages of which equipment, and for the character of services thus rendered, each has a large clientele only too glad to pay commensurate fees.

Now, let me assure Doctor Bowers that the M. D. after a name does not necessarily imply that all the requirements that should accompany it are to be found in its possessor, and many a victim of such has been under my observation. In one of the largest hospitals of an eastern city I have seen a dozen children operated upon for adenoids and tonsils, one after the other without the instruments being sterilized, for there was no sterilizer in the clinic. The instruments were washed under the tap. I must admit I would not have believed this if I had not seen it myself. All clinics are, fortunately, not so careless or rather let us say inhuman and they are not all to be judged by the errors of one or possibly a few.

For a dentist to go from an operating chair to the phone without washing his hands is of course wrong, and is not the universal practice; but what of the physician?

Does the fact that a high school diploma, or a college degree accompanying the degree of M. D. lessen the gravity of the situation when the physician possessing them goes his rounds of visits, using his stethoscope upon one patient after another, some possibly with eruptive diseases, without ever sterilizing it? Many instances of such errors in aseptic technic to be seen daily in medical practice could be given, but these will suffice.

Is it not a well known fact that many of the medical profession, the best as well the indifferent, are frequently, very frequently, inconsiderate of the welfare of their patients in going from one to another without taking due precaution against carrying contagious diseases, and as a consequence, that they do not infrequently carry such diseases from one patient to another? The facts undoubtedly are that there is much to be desired in the way of consistent cleanliness among all people; that the lack of it among some of the medical and dental fraternity is greatly to be deplored; that the one profession is probably not any more lax than the other, and that the medical men who are lax have the opportunity to do much more real harm than the dentists.

Respectfully,

C. EDMUND KELLS, D. D. S.

Book Reviews.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

American Addresses. By SIR BERKELEY MOYNIHAN, M. S., F. R. C. S. Philadelphia and London: W. B. Saunders Company, 1917. Pp. 143. (Price, \$1.75.)

Sir Berkeley Moynihan is one of the great surgeons of England. His clinics at Leeds have been the Mecca of many American surgeons and his tour through the United States last fall enabled many Americans to hear him for the first time and those who had that privilege will always recall it with pleasure. Such as could not hear him will find this little volume, composed of addresses delivered during the course of that visit, an interesting index of the man. The opening chapter is a philosophical disquisition on the causes of the war such as would fit well into the pages of *The Nineteenth Century* or the *Fortnightly Review*. The most interesting portion of the book is that which deals with war surgery and which is based on the vast experience gained by the author as chief surgeon of the great war hospital at Leeds. His style is terse, clear, and crisp. His views are positive and are clearly and unequivocally set forth, and, based as they are on wide experience, are entitled to careful consideration.

Medical Research and Human Welfare. A Record of Personal Experiences and Observations During a Professional Life of Fifty-seven Years. By W. W. KEEN, M. D., LL. D. (Brown), Emeritus Professor of Surgery, Jefferson Medical College, Philadelphia. Boston and New York: Houghton Mifflin Company, 1917. Pp. x-160. (Price, \$1.25.)

The subtitle of this small book, *A Record of Personal Experience and Observation During a Professional Life of Over Fifty-seven Years*, sums up admirably the rather spread eagle title, *Medical Research and Human Welfare*. A personal record of one who has lived and worked and achieved success scientifically and spiritually in this greatest of professions is well worth study. Men of the younger generation will do well to read and think about these lectures. They will see present day science through the perspective of a lifetime of study and endeavor after the finest things, through the medium of this keen, human, and humane intellect. The book contains chapters on all the phases of achievement and advance in medicine during the author's lifetime—anaesthesia, bacteriology, anthrax, puerperal fever, hydrophobia, syphilis, smallpox, yellow fever, hookworm, tuberculosis, cancer, diphtheria, typhoid and typhus, tetanus, the internal secretions, etc. Such a program could, of course, be extended *ad infinitum*, but the clear vision and sure touch of the master mind have isolated the salient features of each topic and summed up

in a few pages half a century of progress. The story is a withering answer to the obstructionist, a clarion call to the discouraged.

The Surgical Operations on President Cleveland in 1893. By WILLIAM W. KEEN, M. D., LL. D., Emeritus Professor of Surgery, Jefferson Medical College, Major, Medical Reserve Corps, U. S. Army. Philadelphia: George W. Jacobs, 1917. Pp. 52.

Many practitioners will remember the few days in 1893, in the midst of a serious financial and political crisis, when President Cleveland disappeared from public view and no clear account of his whereabouts and his purpose was obtainable, except that he was to be treated for some slight vague physical condition. The story of this mysterious incident is told simply and fully in this small volume of fifty-two pages. It makes an hour's pleasant and interesting reading. In brief, it is a page out of the life of a great surgeon, a crisis in the career of one of our presidents, and an example of skillful political and financial camouflage. It gives a concise statement of the reasons for secrecy, a summary of the financial situation, which quite made our head swim, and a history of the case together with an appreciation of the distinguished patient. This case of complete and successful professional censorship is all the more interesting by reason of the conspicuous field of operation, the jaw, and the importance of hoodwinking the press.

Births, Marriages, and Deaths.

Died.

- BAYLISS.—In Miamisburg, Ohio, on Wednesday, January 23d, Dr. Edward B. Bayliss, aged fifty-four years.
BRADLEY.—In Roxbury, Mass., on Thursday, January 10th, Dr. Charles Seymour Bradley, aged sixty-five years.
BURR.—In Rocky Hill, Conn., on Tuesday, January 22d, Dr. Frank L. Burr, aged seventy-one years.
CHAMBERLAIN.—In Chicago, Ill., on Wednesday, January 23d, Dr. Nelson H. Chamberlain, of Oakland, Cal., aged forty-nine years.
EVANS.—In Sandersville, Ga., on Wednesday, January 23d, Dr. Julian H. Evans, aged forty-eight years.
GILLMORE.—In Camp Greenleaf, Fort Oglethorpe, Ga., on Sunday, January 20th, Dr. Robert Tracy Gillmore, of Chicago, Ill., aged fifty-one years.
GORDON.—In Quincy, Mass., on Friday, January 25th, Dr. John Alfred Gordon, aged seventy-five years.
HAGERMAN.—In Sciota, Pa., on Sunday, January 27th, Dr. John A. Hagerman, aged sixty-seven years.
HAWKINS.—In Waco, Tex., on Thursday, January 24th, Dr. Charles C. Hawkins, aged sixty-two years.
IRWIN.—In Jacksonville, Fla., on Friday, January 25th, Dr. Thomas L. Irwin, Sr., aged eighty-one years.
JAMES.—In Harrisburg, Pa., on Sunday, January 27th, Dr. Eugene H. James, aged sixty-one years.
LAPPEUS.—In Vina, Cal., on Tuesday, January 15th, Dr. Andrew J. Lappeus, aged seventy-three years.
MOHAN.—In Pittsburgh, Pa., on Wednesday, January 23d, Dr. John F. Mohan, aged thirty-seven years.
ODELL.—In Knoxville, Tenn., on Sunday, January 20th, Dr. O. A. Odell, aged eighty-three years.
ORNELAS.—In Laredo, Tex., on Saturday, January 19th, Dr. Plutarco Ornelas, aged sixty-three years.
OSTRANDER.—In Brooklyn, N. Y., on Wednesday, December 26th, Dr. George A. Ostrander, aged eighty-three years.
PRINGLE.—In Pocatontos, Ark., on Tuesday, January 22d, Dr. Cyrus E. Pringle, aged fifty-seven years.
SILVA.—In Sacramento, Cal., on Saturday, January 19th, Dr. Manuel S. Silva, aged fifty-five years.
STANHOPE.—In Lincoln, Neb., on Saturday, January 19th, Dr. Redington Stanhope, aged eighty-one years.
SURBER.—In Indianola, Ia., on Sunday, January 20th, Dr. Levi H. Surber, aged sixty-eight years.
WALK.—In Philadelphia, Pa., on Saturday, January 19th, Dr. James W. Walk, aged sixty-five years.
WATSON.—In Columbia, Mo., on Saturday, January 19th, Dr. Berry Watson, aged eighty-five years.
WOODS.—In Odessa, Del., on Friday, December 21st, Dr. Walter V. Woods, aged sixty-four years.

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THE RELATION OF THE WAR TO THE NOURISHMENT OF CHILDREN.*

By S. JOSEPHINE BAKER, M. D., D. P. H.,

New York,

Director, Bureau of Child Hygiene, Department of Health of the
City of New York.

Our entry into the world war has marked not only a new relation towards European affairs but has caused in a signal manner an entire readjustment of our attitude toward our own country. The relation of the government to the individual in a democracy in times of peace becomes somewhat detached. In times of a national crisis, such as war, the direct relation of the government to the individual is a predominant factor. Nowhere can this be seen more clearly than in the working of the draft law. For years humanitarians and social workers have been emphasizing the responsibility of the state for the physical and mental welfare of its people. Progress along this line has been slow and beset with many difficulties. With the coming of the war and the drafting of the young men of the nation not only have the States felt a closer comradeship than ever before but the paternalistic character of the government has been accepted with little, if any, question.

We have become used to the trite expressions that "the child is the ward of the state" and that "the child is the asset of the next generation," yet, never have they been so vitally true as at the present time. Whatever may be the attitude of the government toward the adult part of the community, we realize now as never before that its attitude toward children, with particular reference to their physical and mental wellbeing, is of the utmost importance. If this war means anything, it means safety for the next generation. It is essentially our children's war, and not ours, that we are fighting. Those of the adult population who have gone out to fight, or those who remain at home, need not expect that in their generation all vestiges of this war will have vanished, but for the children the war will have opened a new world and our children will be the ones who will decide whether or not the struggle was worth while.

It is a curious coincidence that as we must look after our children in order to save them from the immediate effects of the war, so also it is war that

has always called attention to the need of care for the children. It was the Boer War that started England on its nation wide supervision of the health of school children—not humanitarianism but the shock that came from finding so many recruits for the army physically unfit. Germany, with its well laid plans for a big standing army, has realized for many years the necessity of spending vast sums of money to reduce the infant death rate and promote the health of all children. The declining birth rate in Germany and France has been the signal for them to bend every effort to keep alive and well the babies who were born. France, particularly, has had to face a declining birth rate for so long that we owe that country the honor of having inaugurated all of our important health movements for children, from its inception of the system of health supervision of school children in 1842 to the establishment of the first infants' milk station in 1892. The crèche or day nursery was inaugurated in France and the same country had the first laws governing the employment of expectant mothers, with a money subsidy for those who nursed their babies. Since the war started, the falling of the birth rate has been an even more serious matter in these countries. Sir Bernard Mallet, registrar general of England, referring to the effect of war upon marriage and the birth rate, states that since the war the United Kingdom estimates its loss by the fall in the birth rate at over 500,000 potential lives. Germany has lost in the same period 2,600,000 and Hungary 1,500,000 by the fall in the birth rate. All of these countries, feeling the great need, are making much more extensive efforts toward the preservation of child life than ever before.

In the United States we have not yet faced a decrease in our birth rate and the extensive infant welfare work throughout the country has resulted in a steady and continuous decrease in the baby death rate. This is particularly true of our cities, where systematic baby welfare work is carried on. In the country districts and small towns, the rate is still abnormally high. We have been priding ourselves in this country upon being a young and vigorous nation, and have apparently been unwilling to face the significance of the physical deterioration of our children. Even now there are few people who appreciate the full import of the statistics that have been given out in regard to the physical condition of the men drafted or desiring to enlist in our army and navy.

*Read on the Ellen H. Richards Foundation at Vassar College, Poughkeepsie, N. Y., January 18, 1918.

During the first six months of 1915, two years before we entered the war, out of 11,000 applicants for enlistment in the United States Marine Corps, only 365 were considered physically fit. In other words, only one out of thirty-five of these young men was sufficiently normal, from a physical point of view, to be accepted. The report of the Surgeon General of the Navy for 1916 shows seventy per cent. of rejections for the navy and Marine Corps. The figures for the army have not been so easily obtained, but it is stated that of 278,537 applicants for enlistment during part of the period from 1914 to 1917, 205,281, or 73.3 per cent., were rejected at the recruiting offices because of physical defects which were apparent even to a person who had no medical training. At the recruiting depots where the men are subjected to a rigid physical examination, an additional 10,062, or 3.6 per cent., were rejected, making a total of 77.3 per cent. rejected. The figures for our new National Army are not yet complete but of the men who were called by the draft about thirty per cent. were declined by the exemption boards on the ground of physical unfitness. From authoritative sources I am informed that it would be safe at the present time to place the number of rejects somewhere between forty and fifty per cent. and the latter figure is probably correct.

A study of the causes of rejection will show that between sixty and seventy per cent. are preventable diseases. Approximately sixteen per cent. of these men were rejected because of underdevelopment or undernourishment. These figures have not caused any surprise to those who have for some time known of the conditions existing among children of school age in the United States. Several years ago Dr. Thomas D. Wood, professor of physical education at Columbia University, made a survey covering the 20,000,000 school children between the ages of six and fifteen years of age in the United States. His conclusions were that from 1.5 to two per cent., or between 300,000 and 400,000, had organic heart disease. Five per cent., or 1,000,000, had tuberculosis of the lungs. Five per cent., or 1,000,000, had some orthopedic defects, such as spinal curvature or flat feet. Five per cent., or 1,000,000, had defective hearing. Twenty-five per cent., or 5,000,000, had defective vision. Twenty-five per cent., or 5,000,000, were suffering from malnutrition, in many cases due in part at least to one or more of the other defects enumerated. Thirty per cent., or 6,000,000, had enlarged tonsils or adenoid growths. Over fifty per cent., in some schools as high as ninety-eight per cent., had defective teeth. In all, about seventy-five per cent., or 15,000,000, of the school children of this country needed attention for physical defects which were partially or completely remediable and nearly all of which were preventable.

In the cities, conditions in this regard have improved materially, owing to the systems of school medical inspection or health supervision of the school children which are common in all the larger towns and cities. In the country and in rural districts, however, conditions have not improved. The reports that come to us from the cantonments show

that, on the whole, the city boy not only passes a better physical examination but stands up more readily under the severe routine of camp life than does the country boy. Surveys also made by Professor Wood show that in the country or rural districts physical defects among school children are almost twice as prevalent as they are among city children. While physical abnormalities, such as defective vision, enlarged tonsils or adenoid growths, defective teeth, or other abnormalities, have decreased owing to the vast amount of preventive work being done, the war has brought to this country, as well as it did to Europe, an increase in ill health due to undernourishment among children. This is all the more alarming because it strikes at the very foundation of all good health not only during childhood but in adult life.

This question of undernourishment of our children is vital. It is the result of the social and economic changes due to war. In order to recognize the seriousness of this condition it must be remembered that at no time during life does the human being react so quickly to circumstances as during childhood. Environment and food both have a very direct connection with the child's wellbeing. An adult can live in fairly insanitary surroundings and eat a limited diet for a considerable period of time without any unusual harm, but the child cannot. The latter needs food not only for replacing waste tissue but also for growth and if that food is not available the nutrition is so seriously impaired that not only is the child rendered nonresistant to disease in all forms but the effects of the impaired nutrition are a handicap all through life. It may be said with assurance that undernourishment of children is the most serious of all menaces to the future of a country.

At present, in this country, undernourishment of children is on the increase. We are having the same experience during our early years of warfare that was the common lot of all European nations during 1914 and 1915. We have reliable evidence from Doctor Lucas's reports regarding Belgium that owing to lack of suitable food there were thousands of debilitated adolescent children in that country when the Committee for Relief in Belgium began its work. Doctor Lucas found that rickets, which is entirely a nutritional condition, has increased from eight per cent. in 1914 to twenty-one per cent. in 1916 and that tuberculosis among children had increased to such an extraordinary extent that the hospitals and tuberculosis sanatoriums, even with many additional clinics, could not care adequately for the cases.

In France much the same condition has been experienced. The undernourishment of children has resulted in a vastly increased number of cases of tuberculosis during adolescence or young adult life. In England the increase has not been so marked, yet the death rate per 1,000 living children between the ages of ten and fifteen years from tuberculosis has increased from 0.29 in 1913 to 0.33 in 1916 and other forms of tuberculosis have increased from 0.27 in 1913 to 0.35 in 1916.

Recent reports from Germany show the effect the lack of food is having on German children, as

told by a German official in a newspaper article which has found its way to this country. Examination of the school children of Germany shows that the food scarcity has most affected the height of those between the ages of twelve and fifteen years and the weight of the children was most affected between the ages of thirteen and seventeen years. For almost every age the one year 1917 shows a smaller average stature of the children than during 1914. For children this amounts to three centimetres—about one and one fifth inches. For the same period the average loss of weight is 2.1 kilograms, or 4.62 pounds. The loss of weight is still greater for the ages of eighteen and nineteen years. The inference seems justified that the older children, who virtually have finished their growth as far as height is concerned, suffer from loss of weight from the underfeeding. The authority quoted concludes that these conditions are due to deteriorated food supplies.

There is no doubt that persistent underfeeding is harmful to bodily development and if this effect is clearly seen in children who come mostly from the better classes it must be still more evident in children from the poorer classes. The conditions in this country are reflected in the statistics for New York City. In classifying the children as to grade of nutrition, the Dunfermline scale is used. This divides the children into four grades: 1, the normally healthy or excellent; 2, the passable; 3, those needing careful supervision; and, 4, those needing actual medical attention. Under this classification, in 1914 five per cent. of the children in the New York City public schools were found to be suffering from undernourishment; in 1915 this was six per cent., and in the school year 1916-1917 it was found that twelve per cent. of the children were so affected. This statement regarding well developed cases of undernourishment, however, does not fully reveal the seriousness of the situation. Of the 1,000,000 school children in New York City, 280,000 were in the first, or excellent, grade; 600,000 were in the second, or passable, grade; 90,000 were in the third, or distinctly undernourished, grade; and 30,000 were in the fourth grade.

The recognized cases of undernourishment are receiving attention, as far as the facilities of the city permit. The class that may be considered of even more vital interest is the second, or passable. These children are borderline cases. The continuance of present conditions regarding food will inevitably lead them to be classed in the third or fourth group. These figures are considered as an index. They were gathered in the regular routine of school medical inspection work and are not felt to represent truly the conditions existing. It is a well known fact that reports of medical inspectors or even experienced social workers regarding malnutrition among children will frequently vary widely from those of special investigators who have not had experience. The former have, in almost all instances, become accustomed to the undernourished condition of the children and note only the worst cases. The latter are invariably shocked at the prevailing low standard and base their comparison of these children on the best type of the well fed American child. In order, therefore, to obtain positive

rather than relative standards, an intensive study was made by the Association for Improving the Condition of the Poor and the Bureau of Child Hygiene, of all pupils in two New York City schools, comprising 2,538 children. Among these children it was found that twenty-one per cent. were in the excellent class, forty-three per cent. in the passable class, twenty-four per cent. in the poor nutrition class, and twelve per cent. in the seriously undernourished class. These figures, if used as a basis of computation among the million elementary school children of New York City show that there are at the present time 120,000 children who are so seriously undernourished that they need medical care. In addition, 240,000 need to be under active supervision and direction as to their food and surroundings and 430,000 are borderline cases, leaving only 210,000 out of 1,000,000 who might be said to be in good physical condition. It was found that this condition of undernourishment which is so markedly on the increase has, as I have stated, definite economic and social relations.

The United States Labor Bureau statistics, using one dollar as a unit for retail prices of food and rates of wages an hour, show that in 1907 the unit rate obtained; that is, one dollar represented the wages an hour and one dollar represented the unit of retail price of food. In 1916 the rate of wages an hour had increased to \$1.19 while the retail price of food had increased to \$1.39. In January, 1917, the food had increased to \$1.56, while in February it had risen to \$1.62, wages at this time being at the rate of \$1.18. In other words, the increase in retail price of food has been sixty-two per cent. as compared with an eighteen per cent. increase in wages during the same period. From this it is easy to see the inevitable result. The increase in wages has not offset the decrease in the buying power of the dollar. Probably never before in the history of this country has there been so little unemployment or such universally high wages, yet probably never before have our children been so underfed or so lacking in vitality. There is no actual starvation among the children. It is a question of habitual underfeeding or wrong feeding for the last year and a half to two years.

The social conditions are mainly those of ignorance or inability on the part of the parents to make the most of their limited means in buying proper food. Also, the size of families, with special reference to the income, is a factor of importance. It was found, in our investigation, that the families of the children who are underfed and undernourished average twenty per cent. more children than do those of better nutritional condition, while in a survey of the cases under care at the Bellevue Hospital Nutrition Clinic in 1917 it was found that the number of children in the family was in inverse ratio to the degree of improvement made in weight. A study of the families of these children with reference to their nationality is of interest. The best conditions of nutrition were found among the native born children of foreign parents, over one half of those studied, and the worst conditions were found among the native born children of native parents, about one sixth of the cases, thus placing the Americans in the worst position regarding the nutrition of their children. We found that of the several race

groups the Hebrews came next, followed by the miscellaneous groups which included the Irish and British families. The Italians, Austrians, and Russians stood well in the scale and the best conditions were found among the Germans.

The real significance of this condition is the fact that undernourishment means lessened resistance to disease. Underfed children will not only contract the diseases of childhood more readily but without the vitality to resist the infection, the undernourished child will, in the majority of instances, be the first one to fall victim to tuberculosis. Already tuberculosis is on the increase in this country. It is markedly on the increase throughout Europe. Among these undernourished children in England a study has shown that in over nineteen per cent. of the cases tuberculosis could be definitely recognized while in a large additional percentage its presence was suspected.

Before it is too late, let us learn from our allies the lesson of the importance of the child. Sir George Newman, who is general medical officer of Great Britain, states that, as a general procedure, it may be said that "a state cannot effectually insure itself against disease unless it begins with its children" and as a result of his experience during the last three years he outlines the necessity of the care of the child in a manner that we may well follow:

The European war has given new emphasis to the importance of the child as a primary national asset. The future and strength of the nation unquestionably depend upon the vitality of the child, upon his health and development, and upon his education and equipment for citizenship. Great and far reaching issues have their origin and some of their inspiration in him. Yet in a certain narrow sense everything depends upon his physique. If that be sound, we have the rock upon which a nation and a race may be built; if that be impaired, we lack that foundation and build on the sand. It would be difficult to overestimate the volume of national inefficiency, of unfitness and suffering, of unnecessary expenditure, and of industrial unrest and unemployment to which this country consents because of its relative failure to rear and educate a healthy, virile, and well equipped race of children and young people. There is no investment comparable to this, no national economy so fundamental; there is also no waste so irretrievable as that of a nation which is careless of its rising generation. And the goal is not an industrial machine, a technical workman, a "hand" available merely for the increase of material output and the acquisition of a wage at the earliest moment, but a human personality, well grown and ready in body and mind, able to work, able to play, a good citizen, the healthy parent of a future generation. If these things be true, as I believe they are, no reconstruction of the state can wisely ignore the claims of the child.

Food is essential to the growing child. If adults must restrict their diet, let them do so as a war necessity. For the child there should be no restriction. If it is impossible, and it certainly is impracticable, to make any widespread changes in the home conditions and readjust all of the social and economic factors that have resulted in this problem, it is not an insurmountable difficulty to meet the problem, if we act from the community point of view. Two methods are open for immediate action: First, the establishment of community centres where mothers may be taught how to adjust the family income to the food needs of the growing child and just what foods to buy. Classes should be held in simple cooking and lessons given in regard to palatable, well balanced diets which meet the needs of

the children. In such lessons careful consideration should be given to the racial preferences of the family for certain articles or types of food. Second, the community may come into more direct contact with the child by the establishment of canteens for children or by organizing school lunches, where an adequate, well balanced meal each day for each child in the community can be provided. These lunches or canteens should not be a charity. Each meal should be paid for by the child and meals should be given free only when necessary. It is true that the school lunches as at present managed show an annual deficit. This deficit should be paid for by the community and be considered as essential an investment as money expended for education.

In establishing work of this kind it is realized that communities are very slow to take the initiative and it is probable that private organizations will have to do the work in many places before the state can be made to realize its own obligation. As rapidly as possible, however, this feeding of the children should become the function of the Government. This work should not be confined to our large cities. If the canteen is impracticable in small towns, instructions in regard to home feeding of children can usually be carried out with little difficulty. The work of conserving the health of our children should be universal. It is war work of the first importance.

Putting aside all humanitarian impulses, if it is possible, and viewing the matter from the coldly practical point of view, there can be no question that the matter of combating this condition of undernourishment of children is an immediate duty of this country; it is a war measure second in importance only to the fighting itself. In fact, our children may literally be considered as our second line of defense. To let anything seriously interfere with their health and development is criminal neglect. In a few years from now it will be too late to repair the damage. At the present time we can do something toward correcting the serious conditions that already prevail and we can surely prevent additional cases from occurring in the future. The question of the health supervision of children should assume in this country the important place that it has already reached in Europe. We are fighting to make the world safe for democracy, we must also fight to make our children fit to perpetuate this democracy, when it shall have been attained.

Examination of the Feces of Chinese Laborers.

E. B. Bowman and P. D. Saylor (*Lancet*, November 24, 1917) submitted the feces of 340 Chinese laborers to examination for the presence of parasites or their eggs and found that eighty-eight per cent. showed infection by *Ascaris lumbricoides*; eleven per cent. by *Ankylostoma duodenale*; four per cent. by *Trichiuris trichiuria*; two per cent. by *Oxyuris vermicularis*; and one per cent. by *Strongyloides stercoralis*. From these results it was obvious that the introduction of Chinese laborers into a community might constitute an element of danger, not only through the spread of these intestinal parasites, but also from the increased prevalence of various unrelated secondary infections, owing to the fact that persons with hookworm infection are apparently susceptible to many infectious diseases.

THE CURE OF HEART DISEASE IN AMERICA AS REPLACING THE HEART CURES OF EUROPE.*

By LOUIS FAUGÈRES BISHOP, A. M., M. D.,
New York,

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Since the time has passed when we can send patients to Europe to take a cure, a consideration of what can be done in this country is worth while. We have hitherto been accustomed to advise people to go to Europe to take a cure for heart disease and often a patient returned having received great benefit. The superficial observer attributed the benefit solely to the wonderful influence of the water at the cure resort. While the water must of necessity be the central idea of the cure, nevertheless, we all know that many other elements enter into it.

Following the business man, who has broken down with a heart affliction, through the steps of the cure, we find in the first place that he is compelled to put his affairs somewhat into the form of an estate and make provision for their administration during his absence. He is compelled, perhaps for the first time in his life, to relinquish personal responsibility for the details of his business. This is a great struggle, but when once accomplished, is a distinct relief to his mind. Then he got on the ship and during the voyage came in contact with people who were accustomed to relaxation and recreation, people who would not listen patiently to his worries, but gave much more attention to the trivialities of the voyage. Very soon his mind commenced to run in other channels, and by the time he landed on the other side he was really, for the first time in years, ready for a real vacation.

After a week or two in London or Paris, he finally arrived at the cure resort and there he met an entirely different type of physician, from those to whom he had been accustomed. He met a man who believed in the cure of heart disease, even if to make his belief true he had to modify the meaning of the word "cure." A "cure" in the sense of the resort physician, means a period of time spent in putting the patient in order so that he can enjoy a reasonable time of good health, if possible until the next cure season could come round. It does not mean in heart disease that the person who has had a cure has been made perfectly sound. It means that he has been made well and taught how to keep well.

At the cure resort the greatest reliance is placed upon the forms of treatment other than by drugs, though this is not pursued to a fanatical point. The candidate for a cure is put to bed for observation and all drugs are removed and only those returned to the treatment that are found to be absolutely necessary. As the cure goes on these also may be gradually withdrawn. When the condition of the heart has been thoroughly appraised the person is allowed up and commences the course of treatment. In the heart these usually consist of saline carbonated baths and certain forms of exercise. These are given

with a great deal of art founded on a vast experience. The details of the treatment are varied to suit each individual and the personal equation is never forgotten.

The cure resort has an atmosphere of its own. Those who are benefited return year after year. They have learned how to describe the benefits they have received and are firmly convinced that their lives are prolonged by their annual cure. They count for encouragement to the newcomer and form a very valuable adjunct to the treatment. Of course those who are not benefited do not come back and there are conspicuous failures, but in a well conducted cure resort these are not mentioned. It has always seemed to me that this amount of hypocrisy was entirely justifiable as giving the necessary uplift to the heart patient who, often enough, is prone to suffer from profound depression.

After the cure, which occupies from three to six weeks, the invalid went somewhere for an aftercure, as for instance to Switzerland, for a rest in the mountains. By and by he returned to America. He had discovered that there was a world of people who did not work and grind all the time. He had discovered that other people could do much of his work for him. He had been told of the necessity for the annual cure which, in fact, was nothing but a scientific vacation; and he often brought with him a very definite diagnosis made by instruments of precision which until lately were not generally available in America.

We are now faced with the problem of how to get this benefit for our patients since travel to Europe is impossible. In the first place we must grasp the general idea of a cure. It is sometimes well in America to translate it into "a course of treatment." Try to get a person to agree to give up four to six weeks to a course of treatment, preferably, of course, with a change of environment. A man not living in New York can take a course of treatment as well in New York as anywhere else. The New York man should go to Philadelphia or some other city if possible. The preliminary rest and observation in bed can be accomplished perfectly well at home. The withdrawal of unnecessary drugs can be accomplished at home. Artificial saline carbonated baths have long been recognized, even by Shott himself, as a fair substitute for those obtained at the springs. What is hard to imitate in this country is the spirit of relaxation and it is hard to get the mental uplift that goes with a crowd of people taking a cure in a hopeful spirit.

The baths, as originally given in the city in professional bathing establishments, are impaired by the overemphasis upon the chemical properties of the water and the lack of emphasis upon the concomitant measures. To take a bath for a heart condition and receive any benefit from it, one must allow at least two and one half to three hours, so that the bath can be entered into deliberately and suitable rest and exercises can be taken afterward. When a person comes from out of town for this kind of treatment he should not combine this trip to the city with anything else but should give up the whole morning or afternoon to the bath. The person who gives the bath must be qualified to supply

*An address delivered before the Richmond County Medical Society at the annual meeting, December 12, 1917.

in a measure the psychical elements of the cure resort. The one who administers the bath must have a true faith in its efficiency and must be able to inspire the same in the one who is taking the treatment. This requires patience and work and is not to be found in the average bath attendant. For this reason the baths should be given by a specially qualified trained nurse who is properly compensated for her time. This, of course entails an expense that puts the proper bath treatment of heart disease beyond the reach of many people except at the cure resorts where it is not necessary to duplicate everything for each individual. Experience has shown that a course of twenty baths, given as they should be, entail an expense of about \$100. It involves the services of a specially trained nurse part time for seven weeks, the purchase of chemicals, and the use of a suitable bath and rest room. The trouble with most American cure resorts is that they have not sufficiently specialized in heart patients. The cure of the heart patient is essentially one of reconstruction and requires special methods that are not compatible with the cures that have to do with the reduction of weight or even the elimination of gout and rheumatism. This has been recognized in Europe where it was quite customary for cures in which liver disease was most prominent, to send heart patients to other places. A crude way of expressing it is that the heart patient should be put into the water while the water should be put into the liver patient.

There is need in this country of some cure resort that will be specially for heart patients, including, of course, those with high blood pressure conditions. Many of the cure resorts, such as Saratoga, have started in this direction, but each time they have been dissatisfied with the limitation of their work and have spread out to cover every known ailment and have consequently failed in the proper development of their heart cure. Of late one or more of the incorporated sanatoriums have improved in their heart work. For those who cannot leave home, a careful physician can substitute a fairly good cure, provided he has sufficient control of the sufferer. He can gain the consent of his patient to a course of treatment covering three to six weeks. He can make his thorough examination with the x ray, the electrocardiograph, the polygraph, and the sphygmomanometer. He can have a Wassermann reaction, a uranalysis, a blood count, and such other observations as his condition suggests, as well as is done in a foreign cure resort. He can reduce his drugs to the actual need of the person. He can institute hydrotherapeutics, graduated exercises, and other measures as may be needed. He can perhaps persuade his patient to give up some of his worrisome business affairs and then send him to some quiet and distant place for an aftercure.

What is really most needed for the cure of heart disease in America as replacing the heart cures of Europe, is a keener realization of the problem than the discovery of a particular resort.

100 EAST SIXTY-FIRST STREET.

TUBERCULOSIS AND X RAY PLATES.

BY MARY E. LAPHAM, M. D.,
Highlands, N. C.

There was a time when we thought that the sight of tuberculous processes in the lung as shown in x ray plates would afford us more precise information than could be obtained in any other way, and for a time efforts were made to base diagnoses and prognoses upon their extent and nature. Then we gradually learned that these structural changes were not necessarily associated with clinical proofs of disease and so could not be depended upon for a diagnosis. At present we do not make a diagnosis of tuberculosis of the lungs unless there is sufficient clinical evidence because we find that structural changes are present in the lungs of adults with good working capacity and in apparently well children.

Although we cannot make a diagnosis of tuberculosis from x ray plates alone they nevertheless afford us highly valuable and practical information. One especially valuable fact established by a study of them is that structural changes in the bronchial glands and lungs are common. All tuberculosis specialists know that in attempting to make a diagnosis of a doubtful case in a child we cannot place much reliance upon the enlarged bronchial glands and infiltrations of the lungs as seen in x ray plates because, as we say, they are so commonly found in well children. While we all admit that this common finding in well children makes the testimony of x ray plates indefinite and unreliable, none of us seems to be greatly impressed with the significance of this fact. It does not seem to have occurred to any of us that any very great importance should be attached to it or that there is any reason why its significance should be determined. This fact seems to be regarded with much the same indifference as the fall of an apple until Newton revealed the significance of the fall. We do not seem to be at all interested in the fact nor do we care to know why these structural changes are so common in the bronchial glands and the lungs of well children. It does not follow that these structural changes are tuberculous in their nature, for any infection, such as measles, whooping cough, or typhoid, might cause them. There are two other corroborative facts equally important, equally well admitted, and equally in need of interpretation. Why are positive tuberculin reactions so common in apparently well persons and why are tuberculous lesions so often found at autopsies when there has never been a trace of clinical tuberculosis during life?

We have three proofs that tuberculous processes are common, not necessarily associated with the disease called tuberculosis and not necessarily inimical to health. Moreover, these three classes show about the same percentages of occurrence which differ with conditions of life but maintain a fairly constant relationship. Is it possible that these structural changes, as seen in the x ray plates of lungs of cases not regarded as tuberculous, are in the nature of living autopsies and that we see in them the same truths revealed by positive tuberculin reactions and by autopsies? If so, then we have learned from x ray plates that tuberculous processes are common

during life and in health and are not necessarily associated with tuberculosis. If we admit this frequency, then we should demand its explanation. What is the reason for it? What relationship has this frequency to the prevention of tuberculosis? Does exposure to the sputum from open cases suffice to create it? Is there any other source of infection now concealed from us?

Another important point associated with this frequency is that they are very persistent and true to type. We do not see them come and go nor do we find a confused, heterogeneous jumbling of various types, but all the x ray plates tell the same story in the same way and the difference in one plate from another is simply one of degree. When we find plates with no enlargement of the bronchial glands and no thready infiltrations of the lungs, we say that these are normal conditions. The first abnormal conditions are seen in the enlargements of the bronchial glands and there may be various degrees of size; the second set of changes consists in thready infiltrations running from the root of the lung up toward the apex. Then in successive stages the bronchial glands become larger and larger with sometimes a central lighter area which suggests softening; the thready infiltrations become more and more massive; mottling and circumscribed nodules are seen until finally the typical picture characteristic of cases of undoubted tuberculosis is presented and we learn that as far as x ray plates are concerned, there is not necessarily any difference between a case in which the person needs care and one in which the individual is earning a good living.

Beginning in the lungs of children and infants and appearing throughout all ages one gains the impression that these changes are permanent, that they do not come and go, and that their development requires time. The conception of tuberculosis as a disease due to exposure to infection which results in the so called "implantation" does not seem to be confirmed by x ray plates which rather suggest that tuberculous processes begin in the bronchial glands of infants and children for some unknown reason and persist indefinitely. If this is true, then the diagnosis of tuberculosis as a disease depends not so much upon the detection of structural changes in the lungs as upon the recognition or estimation of the effects of these changes upon the health. If it is true that all cases of tuberculosis pass through a period of indefinite duration during which there are no clinical signs recognized as warranting a diagnosis of tuberculosis, then the standards of diagnosis for manifest cases will not be suited to the estimation of latent ones. To be able to understand and estimate properly the relationship of latency to disease we must be thoroughly informed of the first effects of latent tuberculosis upon the health or else we shall be forced to wait until latency changes to manifestations. During the preparatory periods preceding manifestations there are pathological changes in the lungs which create typical physical signs, detecting and explaining them. The pathological changes characteristic of latency and their physical and clinical consequences have little or nothing to do with the Hippocratic ideas upon which we so largely depend for a diagnosis

of tuberculosis of the lungs. The expressions of these pathological changes are chiefly related to pressure upon adjacent structures and to the effects of the toxins upon the vegetative nervous system and the ductless glands.

Pressure upon the air passages interferes with the proper entrance of air into and escape from the lungs; pressure upon the vagus causes irritation shown in its terminal endings; pressure upon the return circulation causes stasis and blockage. To estimate these conditions demands another set of standards from those revealed by rales, harsh breath sounds, cough, fever, etc. A study of x ray plates shows that beside the disease called tuberculosis of this or that organ there are other consequences far more common and far less well understood. Beside the manifestations of tuberculosis in the various organs subject to tuberculosis which have hitherto seemed to represent all the effects produced by tubercle bacilli, there seems to be another set of consequences which have not been sufficiently appreciated. If the proper functioning of every organ and every system in the body is dependent upon the proper functioning of the governing forces in the vegetative nervous system and the ductless glands, then any fault in the production of these governing influences may be expressed by improper functioning of the organ or system concerned. The gastrointestinal, hematopoietic, vasomotor, pelvic, and even the central nervous system cannot act properly unless properly influenced by the vegetative nervous system and the ductless glands. If it proves true that the first effects of latent tuberculous toxemias are seen in disturbances of the vegetative nervous system and the ductless glands, then we should be able to detect these disturbances and be influenced by them in deciding whether clinical evidence is present or not. If the diagnosis of tuberculosis is to be made by deviations from health, then we should be thoroughly informed concerning these fundamental ones. In order to recognize the effects of latent tuberculous toxemias and to say whether the structural changes we see in the x ray plates of children are menacing or harmless, it may be that we shall have to understand the entire relationship of the vegetative nervous system and ductless glands to the normal health of children, or we shall not be able to recognize deviations from health caused by functional perversions of these systems. It may be that we shall have to know all the wrongdoing that can result from these functional disturbances before we can sufficiently understand the relationship of latent tuberculous processes to the realm of children's diseases. If every system in the body is likely to go astray on account of a fundamental fault, then the recognition that this fault is caused by tuberculous processes is important. It seems more than probable that children's diseases cannot be understood until we are able to determine whether a disorder manifested in any system primarily originates there or whether it is purely symptomatic and secondary to tuberculous processes.

The pressure of enlarged bronchial glands in erosion of the esophagus illustrates typically the effects of irritating the vagus. The branches of the recurrent laryngeal show their irritation by pain in the

larynx, laryngospasm, hoarseness, and cough: the gastric endings of the vagus may cause the typical clinical picture of gastric ulcer or almost tabetic manifestations. Spasm of the pylorus, tetany, and the spasmophilic diathesis are frequently associated with tuberculosis. When the chromaffin system assumes undue influence, there is a depression of pancreatic activity with frothy stools and threatening acidosis. We need a careful research study of the relationship of the autonomous and chromaffin systems to gastrointestinal functions before we can understand their symptomatic expressions. We vaguely say that the predominating influence of the autonomous system causes overacidity of the gastrointestinal glands with hyperacidity and its consequences as the typical symptoms, and that chromaffin predominance means lack of appetite, constipation, acidity, etc. There is no doubt that many a child is treated with all sorts of medicines and diets when the troubles in the gastrointestinal system are not primary but secondary to tuberculous processes. Hess believes that the first effect of tuberculous toxemias is stimulation of the chromaffin system, as resistance to infections is one of its main functions. This stimulation may result in overactivity which persists or it may lead to depression and functional insufficiency with secondary predominance of the autonomous system. Falta says that in nearly all cases of tuberculosis there is an insufficient supply of adrenalin shown by low blood pressure and an inability to assimilate iron, to produce neutrophils, to nourish the heart muscle and the vasomotors, and to produce a sufficient amount of energy. If the autonomous system becomes too predominant, we have tuberculides, scrofula, erythemas, edemas, angioneuroses, dermatographism, etc. If the parathyroids become insufficient the spasmophilic diathesis is easily induced and there may be tetany, chorea, etc. In our work with children we are depending upon an estimate of the condition of the vegetative nervous system and the ductless glands to aid us in determining whether the structural changes seen in x ray plates are or are not of a tuberculous nature. Very often children are brought to us on account of gastrointestinal disturbances, hay fever conditions, asthma, etc. These upset conditions usually offer suggestions of undue predominance either in the chromaffin or autonomous systems.

CASE I.—A boy of eight years, pale, peaked, and peevish, was brought to us for periodical acidosis and gastrointestinal troubles. He was underweight, lacking in strength, generally below par, and a marked contrast to his sturdy, jolly, perfectly normal younger brother. He had always been strong and well until he had whooping cough at four years of age and since then he had never been quite well. His frothy stools were full of undigested muscle fibres, starch granules, and quantities of torulae. He weighed only thirty-three pounds and could not keep well in spite of a most carefully regulated diet and various cathartics and other remedies. His systolic pressure was 110, the neutrophils were ninety per cent. of the total 8,000 white count, the hemoglobin was eighty per cent. and there was a tendency to rises in temperature. The pallor, relatively high blood pressure, good assimilation of iron, excess of neutrophils, and depression of pancreatic functions all constituted the clinical picture of a predominant chromaffin system. Several members of his mother's family had arteriosclerosis possibly of an adrenal type. His maternal grandfather died of tuberculosis and his mother was an arrested case. His maternal grandfather and his mother were always lacking in strength.

One is tempted to ask whether it is possible that the tuberculous processes of the grandfather and the mother began in the same way at this age and that the bad health of the boy is associated with occult tuberculous processes. The x ray plates show typical tuberculous structural changes in the bronchial glands and lungs but this does not decide for us. We need much study before questions of this kind can be answered accurately but their answer is most important for the future health of this child.

CASE II.—A boy, nine years of age, was brought to us in the summer of 1916 because he was below par. Originally nothing was wrong. The most pronounced feature of the case was the unfeeling bad effect of exercise. Too severe physical efforts invariably meant a stuffing up of the nose as in a heart model and intercostal squeezing. This boy was always catching cold and having bronchitis and had had one bad attack of pneumonia.

Is it possible that this hypersensitiveness of the respiratory mucous membranes expresses an autonomous irritability manifested by anaphylactic reactions when exercise causes an increased dissemination of tuberculous toxins? This may seem rather far fetched but there are other manifestations of vagus irritability, as in asthma, which suggest the possibility that this hay fever condition might be analogous. The relationship between overexercise and hypersensitiveness of the nasal and bronchial mucous membranes was constant in this case.

The x ray plates showed enlarged bronchial glands and small, cherrylike nodules in the right lung. We frankly explained to the parents that we could not make a diagnosis of occult tuberculous toxemia but that it seemed extremely probable. We advised returning to school with restriction of exercise if possible but this was probably a mistake for it was not long before the boy had a bad attack of bronchitis and a few weeks later there were suppurating glands in the left submaxillary region demanding drainage. He was kept quietly at home for the rest of the winter and remained unusually well until toward spring excessive playing brought on another attack of suppurating glands in the right submaxillary region which were drained. The boy came back to the mountains, gained ten pounds in weight, and became apparently normal with the exception of hay fever conditions following over-fatigue.

CASE III.—A girl of thirteen years old was sent to an orthopedic surgeon for braces to hold up the shoulder girdle. There was nothing much the matter but neither was there any strength. The girl sagged all over as well as in the shoulder girdle. Until three months old she was well and then she had an attack of chorea which was followed by many spasmophilic phenomena and much tendency toward the exudative diathesis. Distinguished pediatricists found that methods of treatment usually so successful for other children did not succeed in her case. The general lack of strength and the sagging shoulders persisted in spite of Swedish movements, baths, massage, etc. Electricity, feeding, and all kinds of attempts to induce vigor failed outright and life out of doors on a farm gave better results than anything else. The physical signs and the x ray plates showed extensive infiltrations of the lungs and the diagnosis of tuberculous toxemia seems warranted, on account of the lack of strength, etc.

In this case do the spasmophilic and the exudative diatheses express too great an autonomous supremacy?

CASE IV.—A boy, eight years of age, came to us with a temperature of 100° F. plus. He had been in bed for six months and carefully fed to reduce the temperature which was supposedly of intestinal origin although the diagnosis of tuberculosis had been made. After watching the case for a month we became convinced that the rise in temperature was not of intestinal origin and advised a more promiscuous feeding and less consideration as to whether the food was suited to the intestinal conditions or not, while at the same time moderate exercise was begun. With constant increase of exercise and less care in feeding, under the influence of a high mountain climate and vaccine treatment the fever gradually disappeared. There were frothy

stools in this case with indigested muscle fibres and starch granules and we inferred that the blood picture and the other conditions suggested a chromafin supremacy responsible for increased basal metabolism and temperature.

We discussed many cases of doubtful diagnosis with the father of the child with hay fever who, impressed with the difficulties and complexities due to our lack of knowledge, generously defrayed the expenses of 100 x ray examinations of the children in our village school. We wanted to know how often in well children structural changes would be found in the lungs which would resemble those found in admittedly tuberculous cases. We felt that x ray plates could not be well understood until we knew what the lungs of well children were like. Fortunately, a distinguished orthopedic surgeon in Atlanta gave us the opportunity of studying fifty more cases and thus we were enabled to learn what conditions existed in the lungs in 150 cases not in the least supposed to be tuberculous. We were also enabled to compare the children living under the disadvantages of overheated, close rooms and schools and the general unfavorable circumstances of city life with our children living in ideal surroundings of woods and altitude and purest mountain air with no steam heat and no close rooms. To our surprise we found very little difference in the results: the percentages were about the same in each class of cases and even the conditions of the tonsils and adenoids did not greatly differ.

Twenty-two per cent. of the Highlands cases and seventeen of the Atlanta did not show sufficient enlargement of the bronchial glands or infiltrations of the lungs to deserve the name of structural changes. Half of these Highlands cases were below the age of ten years and all of the Atlanta. In the Highlands cases there were ten between the ages of ten and fifteen years and only one over fifteen. Could we infer from these few cases that after the age of fifteen in Highlands and ten in Atlanta structural changes were usually found in x ray plates? The remaining cases were classified according to the extent of the structural changes. In Class I there were only moderate enlargement of the bronchial glands and very little or no infiltration of the lungs. In Atlanta there were sixteen cases below the age of ten, eight from ten to fifteen, and none after. In Highlands there were eight below the age of ten; seventeen from ten to fifteen; nine from fifteen to twenty; and six over twenty. Is the development of structural changes delayed in a high mountain climate? In Class II the bronchial glands were more enlarged and there was beginning infiltration of the lungs. There were sixteen cases in Highlands with none below the age of ten; eight from ten to fifteen; five from fifteen to twenty; and three over twenty. In Atlanta there was none below ten; five from ten to fifteen; and two over twenty. In Class III the bronchial glands are considerably enlarged and the infiltrations in the lungs marked, and there are calcified nodules. In Highlands there were nineteen cases, with two under ten; eight between ten and fifteen; five between fifteen and twenty; and four over twenty. In Atlanta there were none below the age of ten; four between ten and fifteen; one between fifteen and twenty; and three over twenty. In Class IV the infiltrations resemble typical tuber-

culous conditions. In Highlands there were three cases all over twenty; in Atlanta there were one at thirteen and one over forty. In Highlands forty-four per cent. belonged to Class I; Atlanta, forty-six per cent. In Atlanta fifty per cent. were below the age of ten; in Highlands, ten per cent. In the x ray plates of these 150 cases we can see all degrees of enlargement of the bronchial glands and thready infiltrations of the lungs from the slightest beginnings to the massive shadows typical of tuberculosis and all without sufficient clinical proof that the disease called tuberculosis exists although it is more than probable in four of the Atlanta cases and two of the Highlands. Although there is not the impairment of health necessary for the making of a diagnosis of tuberculosis, in many of the plates no difference could be found between them and the plates of cases of tuberculosis under treatment.

Taking one of our cases and comparing the x ray plates with those of an apparently healthy adult with good working capacity it is somewhat confusing to find that the extent of structural changes taken by themselves has apparently little or nothing to do with the prognosis. Often we find severe clinical effects from relatively slight structural changes and in other plates showing extensive changes, the working capacity is good and the diagnosis of tuberculosis as a disease cannot be made. In reading the story of structural changes in the bronchial glands and lungs as told by x ray plates we realize more and more how complicated is the difficulty of determining whether the absence of clinical signs really means absence of danger or simply lack of manifestations while danger is really present. X ray plates show us that the type of tuberculous processes longest known and best understood is found in terminal broncholobular conditions and that the preparatory changes leading up to these terminal ones have not been well studied. We have often supposed that tuberculosis of the lung began in the apex because it was first found there on account of its pneumonic nature and accessibility. It now seems far more probable that tuberculous processes enter the lungs from the bronchial glands and extend into the apex where they are first recognized because we have been taught how to look for them there. During the stages of these extensions, the physical signs are not of a broncholobular nature and do not in the least correspond to Hippocratic standards unless the terminal areas break down. The comprehension of the interstitial type of tuberculous sclerosis of the lung demands an entirely different set of ideas from those so well suited to the comprehension of broncholobular and pneumonic conditions. Before we can detect and describe a case of interstitial extensions from the bronchial glands to the apex we must have other physical signs than those now governing our diagnosis. There is as much difference between the early stages of the fibrosing and the pneumonic lung as there is between the desert and the swamp and yet our standards of diagnosis do not take this into consideration. We must obtain a better pathological comprehension before we can work out a set of standards of diagnosis at all adequate to the infinitely varying pathological conditions of true in-

ciency. Our standard of diagnosis now in vogue is only adapted to advanced cases or manifest ones and these chiefly of the pneumonic type.

SUMMARY.

X ray plates teach us that tuberculous processes originate in the bronchial glands and extend into the lungs from them;

That enlarged bronchial glands and thready infiltrations of the lungs are common in children and infants;

That the development of these processes follows a more or less uniform type until secondary complications in the terminal areas of the bronchi occur;

That in all probability these processes begin in early life and persist throughout life, but that their presence is not necessarily or even usually associated with the disease we call tuberculosis;

That the detection of structural changes in the lungs either by x ray plates or physical signs or by both does not warrant the diagnosis of tuberculosis as a disease;

That we need a research study of the relationship of the perversions of functions in the vegetative nervous system and the ductless glands to occult tuberculous toxemias before we can adequately recognize all the deviations from health which may represent a tuberculous etiology;

That this knowledge is especially important for the comprehension of the children's diseases since many of the functional diseases of childhood are secondary and symptomatic manifestations of occult tuberculous toxemias;

That in all probability tuberculous processes do not originate at a definite time in consequence of a definite exposure, but that they begin their development in earliest life, persist indefinitely, and owe their dangerous features to causes not understood and greatly in need of research study;

That the best prevention of tuberculosis consists in the earliest possible recognition of the deviations from health caused by the assumption of pathological properties by tuberculous processes commonly present in the lungs and bronchial glands and usually harmless.

HIGHLANDS CAMP SANATORIUM.

Caliper Extension in Fracture of the Femur.—

Frederic A. Besley (*Journal A. M. A.*, January 12, 1918) lays emphasis on the difficulty of securing sufficient continuous traction by any of the usual methods in cases of fracture of the femur, especially compound, among soldiers. To remedy this difficulty he employs a metal caliper, made like a pair of miniature ice tongs, the points of which are driven into the lateral aspects of the femur just proximal and posterior to the most prominent portion of the condyles. The points are inserted for about a quarter of an inch into the bone through small incisions in the superficial tissues. The extremity is put up in a Thomas knee splint and the whole is slung from a Balkan frame. A weight of about fifteen pounds is attached to the caliper for continuous traction. The method has given satisfaction in all cases, so far as comfort and successful extension have been concerned.

EPILEPSY.*

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The history of epilepsy is almost as old as the history of man and such a wealth of literature has accumulated on the subject that it would be impossible to do it justice in a single paper. Much mystery has always surrounded this subject and almost every experience that man or his ancestors could undergo has been attributed as a cause and nearly every substance, in and out of the pharmacopœia, has been suggested as a remedy, in addition to many procedures some of which were grotesque or barbarous.

In view of the apparent confusion of opinion concerning the cause and cure of this disease we can scarcely hope to find a specific, but there are certain facts and principles concerning epilepsy which, in the light of careful study and investigation, stand out boldly. It is the nervous system that does most to integrate the economy from its component parts, a collection of organs into an individual animal. Integration, however, is not due to a single agency; it is partly mechanical, including intercellular connective tissue, chemical, circulating blood, and internal secretions, exchange of gases in the lungs, heat dissemination, etc. But the nervous system is not mere intercellular material like the blood. It works through living lines of stationary cells along which it dispatches waves of psychochemical impulses which act as releasing forces on distant organs where they finally impinge, and the sympathetico-autonomic plays a most important part in this integration. Afferent sympathetic fibres provide a pathway by which disturbing impulses from the plane of vegetative life may rise to the field of consciousness and become the basis of serious psychic complexes, and by efferent sympathetic fibres disturbances of a psychic nature are distributed to the visceral organs. Thus it can be seen that, while the sympatheticoautonomic chain presides over biochemical processes primarily, it is the intermediate link between psychic and vegetative life. The seizure is only a phase of epilepsy and is of far less importance than the change in personality. The epileptic seizure is sometimes spoken of figuratively as an electrical discharge or explosion and the storage battery is used as a simile. In reality that is exactly true, for our study of cell membranes and their surface tension and semipermeability and polarization give us illuminating data on this subject. We know from Nernst's theory that when the protoplasmic ions making up the cell contents become surcharged, the semipermeability of the cell membrane is increased and a true electric discharge takes place, until the polarization is changed, in other words exhaustion. What could be a more graphic description of an epileptic attack in which the explosion takes place in the form of a convulsion which is followed by a change in polarization and exhaustion with anesthesia and stupor? We know that in anesthesia the semipermeability of the

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cell is lessened and until recuperation takes place another discharge is impossible.

I believe epilepsy is a hypersensitive condition of the cells of the cerebrum. There is a tendency for the autonomic to assume ascendancy and the individual to revert to the lower order of life in which the autonomic is in full control. With the idea that epilepsy is a sexual equivalent I am utterly at variance. Psychological, physical, and chemical stimuli cause response in both motor and psychological fields and the epileptic is hypersensitive to these stimuli. Search has been made for an epileptogenous zone in the brain, but a lesion of any portion of the brain, including the walls of the ventricles and even the cerebellum, may be responsible for epileptic seizures, which, by diffusion along association fibres, become general convulsions. The cortical motor cells, however, probably preside over epileptic seizures, receiving their stimuli in this collateral manner. There are two possible ways in which the cells of the cortex can play a part in the epileptic seizure. The first is that irritation of the motor cells may produce direct efferent impulses and disorganization or co-ordination. The other is that a disturbance of the function of these cells which would eliminate their inhibitory action upon the lower motor centres which are phylogenetically the ancestors of the cortex permits unrestricted action of these centres, as in clonus, etc. The former is probably a more reasonable theory. A case was cited by Gowers in 1881, in which an epileptic had an attack of apoplexy with hemiplegia and the convulsion ceased on that side. Painting of the motor cortex with cocaine has been known to prevent general seizures. Pritchard in 1822 first described local convulsions. Bravais gave it the name of hemiplegic convulsions in 1827. Abercrombie in 1828 described cases of one sided convulsions without loss of consciousness and found a tumor of the opposite side of the brain in one case and induration of the cortex in another. Elliotson in 1831 spoke of the condition as partial epilepsy, but it was Hughlings Jackson who, in 1861, gave the subject its greatest impetus, which finally resulted in the localization of the motor areas of the brain. Hitzig and Fritsch in 1870, by the application of electrodes, marked out the motor cortex. Charcot described a form of partial tonic epilepsy, another vibratory epilepsy, and a third partial sensory epilepsy accompanying ophthalmic headache. Diabetic epilepsy was described by Broadbent in 1883, of the unilateral type. Partial epileptic attacks due to hysteria have been described by Ballet and Crespin. Fournier described unilateral epilepsies due to syphilis, in 1885. Laborde was the first to describe alcohol as an etiological factor in epilepsy. There seems to be overwhelming evidence to substantiate the views of Raymond, Chantemesse, Tenneson, and Chauffard, that urea can exert a selective toxic effect on the motor area and produce unilateral convulsions. In 1890 Bonhoeffer showed that localized convulsions may be due to idiopathic epilepsy. Bon in 1906 in the study of Jacksonian epilepsy stated: "1. If it is true that Jacksonian epilepsy is a frequent symptom of a lesion of the Rolandic convolution it is no less certain that it may result from a lesion situated

distant from this region, even on the opposite side. 2. Cerebellar lesions produce convulsions usually of the same side. 3. Jacksonian epilepsy sometimes occurs in individuals with generalized epilepsy due to another lesion. 4. Jacksonian epilepsy might be due to hydrocephalus. 5. It may appear spontaneously without explanatory findings. 6. There might be with signs of Jacksonian epilepsy signs of tumor or abscess and the autopsy be negative."

In Marshall Hall's theory of epilepsy there is supposed to be a sudden stimulation of the bulbar centres followed by stasis of cerebral circulation. Brown-Séquard maintains that there is an anemia of the cerebrum leading to the loss of consciousness. Sclerosis of the cornu ammonis, according to Meynert, is responsible for epilepsy. Hughlings Jackson believes that epilepsy affects three superimposed levels, representing different degrees of evolution: medulla, pons, and cerebellum, in the lower forms; the middle area includes corpora striata, cortical, motor and sensory areas, here loss of consciousness may or may not be present (*petit mal*); the superior level is in the prefrontal lobe and unconsciousness always occurs.

Heredity is perhaps the most important of all causal factors. Epileptic, insane, or neurotic ancestors are conspicuous in the history of these cases. Alcohol, syphilis, lead, and other diseases and toxic substances undoubtedly often injure the germ plasma and are responsible for deviate children which are especially susceptible to the development of epilepsy. These include injuries at birth due to prolonged pressure or to trauma incident to instrumentation, blows upon the head even without any apparent gross lesion or depression, gastrointestinal disturbances from mouth to anus, circulatory disturbances, irritation or injuries of the reproductive organs, and irritation of the eyes and respiratory tract. Febrile diseases of early life probably are responsible in a certain percentage of cases for encephalitis with subsequent areas of gliosis; neoplasms may be responsible for both local and general seizures. Trauma to the brain and various parts of the body has been ascribed as a cause and is unquestionably to be considered in certain cases. On the other hand other individuals receive identical injuries without the development of epilepsy. This would lead one to believe that it is not a condition due to anatomical or histological change but is probably of a chemical nature or a disturbance in the composition of the blood due to imbalance of the glands of internal secretion, which permits a periodical toxicity to occur and probably disturbs the electronic impulses and associations passing through our nervous mechanism. If definite anatomical or histological changes are the cause, why should there be long intervals between the attacks; that is, if the anatomical change were the real excitant it would be always present and the convulsions continuous with possible exceptions of short intervals from exhaustion. There may be fine molecular changes which are of a transient nature occurring in these individuals due to these periods when the system becomes surcharged with deleterious substances and these molecular changes, such as were clearly shown by Crile in brains of exhausted soldiers, may act either as excitants produc-

ing the attacks or by causing loss of function remove inhibition, which we know to be an important factor in motor mechanism. Trauma of the head injuring any portion of the brain may by diffusion irritate the pituitary inducing dysfunction which in turn increases the adrenal secretion producing inhibition of peristalsis, intestinal stasis, and autointoxication.

Present knowledge of somatic motor phenomena does not leave us content with former ideas of motor localization being confined exclusively to the cortical cells, and phylogenetic research in this direction strengthens the idea that we have centres dealing with motor phenomena situated elsewhere. The paleocephalon with its large motor cells we know to be a structure of greater antiquity than the cerebral cortex and also the neostriatum of the caudate nucleus which is of later date, the cells of which are smaller and probably have an inhibitive action on automatic motion. Recent experiments also prove that the cerebellum has much to do with automatic movements and this relation of these very primitive motor areas to automatic somatic motion and their semblance to intrauterine fetal movements would seem to strengthen the Freudian conception of epilepsy as an effort on the part of the victim to resume intrauterine life. The integration between these centres and the cortex is so intimate as to make hypersensitivity of their cells responsible for the great diffusion of impulses and vastly disseminated somatic movements. The work of Madame Voght, Kinnier Wilson, and Ramsay Hunt has thrown much light upon this subject. H. A. Cotton, E. P. Corson White, and W. W. Stevenson report sixty-nine cases of epileptic patients, ranging from fifteen to forty-five years of age, in which the Abderhalden reaction was positive to suprarenal gland. These patients were negative to pituitary, thyroid, pancreas, testes, and ovary with one exception, a case lying in status epilepticus that gave a positive reaction to pituitary. It would seem that this positive Abderhalden reaction to the suprarenal is practically limited to epilepsy, according to these authors.

Cannon showed that one of the principal physiological actions of suprarenal is the inhibition of smooth muscle fibres, such as are found in the intestines; it also relaxes the smooth muscles of the bronchioles and alters the distribution of the blood, driving it from the abdominal viscera into the heart, lungs, central nervous system, and the limbs, and he also states that it hastens the coagulation of the blood, which, in the opinion of some authors, is a causal factor in the production of epilepsy. It is well known that adrenalin increases blood pressure and this is a constant finding in epileptic seizures. In 115 cases of epileptics whose skulls were examined by McKenna, Johnson, and Herminger, changes were found in the region of the sella turcica in eighty per cent., while similar changes were found in only ten per cent. of nonepileptics. Cannon demonstrated that fear produced an excessive secretion of suprarenal gland. Fear is an important part of the initial process of epilepsy and the smooth muscle fibres of the intestines are highly sensitive to suprarenal secretion. It has an inhibiting effect upon them. As this inhibitory effect manifests itself in dilutions even 1:200,000 it is evident that any excess

in suprarenal secretion would have a pronounced effect in interfering with peristalsis and favoring intestinal stasis and the resulting absorption of toxic products from the intestines. H. A. Cotton, E. P. C. White, and W. W. Stevenson have shown that removal of the pituitary gland causes changes in the sex gland and later changes in the adrenals; experimental removal of the external function of the pancreas also produces an adrenal gland reaction and irritation of the duodenum in two dogs produced a slight reaction to adrenalin. This may account for the fact that angulations or obstructions of the intestines may give rise to excessive secretion of the suprarenals which, in turn, inhibit peristalsis and favor absorption of toxic substances. These same authors relate cases in which the entire process could be attributed to fright. In these cases the convulsions did not appear until late in life, one at the age of eighteen years, another at twenty-one. The convulsions were usually of a mild character, especially in one case, occurring almost always at night but occasionally in the day time following extra eating. In all of these cases the patients never had any previous convulsions nor was there any evidence of heredity and the convulsions could not be attributed to other causes. Marked increase in intracranial pressure accompanies attacks.

Much attention has been directed to the gastrointestinal tract and its relation to epilepsy is manifest in many cases, or we may say in all cases, for indiscretions or irregularities in diet are unquestionably important factors in the production of epileptic attacks in a vast majority of cases. In view of this focusing of attention on the gastrointestinal apparatus and its demonstrable relation to the attacks, it would not seem unreasonable to feel that there was a correlation between the attacks of epilepsy and the autonomic sympathetic nervous system and also because of the extremely varied factors which may be causative in these attacks and the well known susceptibility of the autonomic sympathetic nervous system to chemical stimuli. It will be noted that the majority of the peripheral irritations that are productive of epilepsy are of parts wholly or principally supplied by the vegetative nervous system.

I am constrained to look upon epilepsy as a state in which the nervous system is highly sensitive and becomes hypersusceptible to certain chemical stimuli. If the condition can be visualized as an increased susceptibility of these nerve cells to chemical stimuli, the condition, I believe, can be placed upon a more rational basis and one in perfect agreement with the facts. At various times efforts have been made to demonstrate a bacterial origin of epilepsy, but nothing conclusive in this respect has been established.

The epileptic is always abnormal in his psychic sphere. He is not in harmony with society and usually, even in the milder cases, he is a difficult person to manage. The mental condition of the epileptic differs from all other forms of mental disease. Its chief features are apathy, lack of power of initiative, and blotting out of the personality. There is not a tendency to flight of ideas and purpose as is seen in dementia praecox, nor is there a building up of an imaginary world nor a distinct

change in the emotions. The essential feature is that of indifference. The memory and power to acquire knowledge is markedly impaired. There is loss of attention and driving power. These patients are not given to expansive ideas or systematized delusions as the paranoid or parietic, but they are cruel, untruthful, irritable, inclined to hypersexuality, unscrupulous, and apt to show childlike affection immediately after an attack. As mental deterioration advances, indifference to attacks increases and even an egotistical element may be injected. This is only in proportion to the amount of mental deterioration. There is never a time when the patient does not look forward to the attack with fear and when the aura is accompanied by a cry it is one of terror. While the individual may be insincere in his promises to carry out rules that would lessen the attacks, he is never insincere in his desire to be rid of them.

DIAGNOSIS.

In well developed cases the diagnosis is not difficult. It is usually made before the patient consults the neurologist. It is in the very early history of the patient that the diagnosis is sometimes not easy and here it is most important that it should be made as soon as possible. What may be called a preepileptic stage exists in certain individuals, especially children who have no convulsive seizures but have irascible dispositions, are given to flying into a rage without much cause, and are always irritable and extremely passionate. These are frequently the prodromes of epilepsy and when children of this type are encountered most careful search should be made for possible peripheral or other irritation which could later produce epilepsy. Some of these children have momentary flashes of vacancy or slight arrest of cerebration which is in reality petit mal and this is sometimes true in the beginning even in adults. A thorough examination should be made in all cases, including the most searching history, going as completely as possible into family and previous history. A thorough physical examination should be made, including the Wassermann and Abderhalden tests; frequent reexamination in all of these cases is of great importance. These children are apt to act abnormally to the Bárány test. The only conditions which may cause confusion in the diagnosis are hysteria and uremia. The hysteric differs both in his psychology and in the nature of the attack. The characteristic emotional instability of the hysteric is very different from the sullen, blunted mentality of the epileptic. The hysteric is fond of display while the epileptic usually shuns it, and the hysteric seizure usually occurs in the presence of an audience, not accompanied by unconsciousness and the patient does not fall or injure himself, bite his tongue or void his urine or feces involuntarily. It is not followed by a stuporous or somnolent state. He can get right up from his attack and assume his normal duties at any time. It must be remembered, however, that some of these hysterics are potential epileptics and the very early attacks of what later proves to be true epilepsy is frequently very similar to hysteria. Some of these patients do not lose consciousness and the attack is preceded by prodromal sensations which give him

an opportunity to seek a place of safety. Those patients later lose consciousness in the beginning of the attack and it assumes the ordinary epilepsy type. Uremia and diabetes must be excluded by their history.

TREATMENT.

The patient must be looked upon as an individual and carefully analyzed and his entire life regulated as nearly as possible. We should treat the individual and not the disease. The treatment may be divided into hygienic, psychotherapeutic, dietetic, medicinal, organotherapeutic, and surgical. Under hygiene we will include the general hygiene of the patient, bathing, and mental and physical exercises. The patient should be kept in a quiet, clean, cheerful environment, free from excitement and external irritations, preferably in the country. Warm daily baths should be given and the skin and emunctories kept active. Moderate outdoor physical exercise should be encouraged and mental occupation insisted upon. I feel that this is of the greatest importance, for I am thoroughly satisfied that mental deterioration can be postponed by particular attention to this point. Mental attention should be carefully cultivated and complete concepts insisted upon. Moderation, however, is always to be used. Psychotherapy is of advantage, especially among the more intelligent patients in whom mental deterioration has not progressed far, and is especially useful in cases in which the attack is ushered in by an aura. These individuals can sometimes be taught to exercise their mental faculties and prevent the actual onset of the convulsion by combating it mentally and overcoming the fear even after the establishment of the aura.

The diet is of paramount importance. It should be liberal but not excessive, partaken of at regular intervals when the patient is not fatigued or excited, ingested slowly, and thoroughly masticated. It should consist of bland easily digested food, excluding red meat, pork, preserved, salted, or smoked meat or fish. Fruit acids are not well borne; salt, alcohol, and all stimulants should be excluded. A diabetic diet is sometimes useful. The exclusion of salt has been advocated by a number of investigators for various reasons, among them the belief that salt neutralizes the effect of the bromides and in cases in which these are used it is contraindicated. However, in my opinion the deleterious influence of salt is due to its disturbance of the gastrointestinal tract by inducing hyperacidity, which it does in two ways: 1, by its direct irritant action upon the mucosa of the stomach, and 2, as I have shown elsewhere (1), by retarding the digestion of food which is preserved by the use of salt. These foods, which are preserved against decay by the use of salt or other preservatives, increase the work of the stomach, the activity of the secreting glands is stimulated and their secretion enhanced, the efforts of the stomach to empty itself cause increased muscular activity and also add to the blood supply of the organ, and a vicious circle is started. These processes favor intestinal fermentation, hyperacidity, and the formation and absorption of toxic substances and, with our present knowledge of the split proteins and other biochemical products,

it requires no very great stretch of the imagination to see that the workings of the nervous system may be disarranged by them. We must be able to individualize our cases and recognize sensitization to individual foods. For instance, I have a patient at present under my care, a boy of ten years, who will invariably have an epileptic attack within an hour after eating a banana.

A very large number of remedial agents have had considerable vogue of longer or shorter duration in the treatment of this disease and careful study has demonstrated that any remedy or procedure that produces a profound impression on the economy is apt to influence the epileptic seizures for better or worse. Frequently accidents accompanied by fright in which mental or physical trauma are received are followed by an interval of improvement in the epileptic's condition and it is such phenomena as these that account for the beneficial results that sometimes follow surgical procedures or the bite of a rattlesnake, for instance, and has given crotonin its place in the treatment of the disease. Of the remedial agents, those which lessen cerebral and nervous irritability, as the bromides, have occupied the most conspicuous place. They are, however, simply palliatives and can never be expected to do more than lessen the number or severity of the attacks while the patient is kept under their influence. Bromide of sodium is the one of election. Strontium has no advantage over sodium bromide when the degree of efficiency is considered in proportion to the dose, and the potassium salt should never be used, for it has been clearly proved by Alsberg that potassium bromide is a true cell poison and when used in the treatment of epilepsy causes cerebral deterioration and hastens mental enfeeblement. Chloretone is used in lowering nervous excitement and can be beneficially alternated with bromides when they are employed. Luminal has also been used in some cases to advantage, but the danger of habit formation should not be overlooked. Where syphilis is present it should, of course, be treated by the well known antisyphilitic remedies. The iodides as a routine treatment, however, are not warranted where there is no spirochetal relation. They have no direct influence on the epilepsy and if long continued tend to produce anemia. In status epilepticus, especially, chloretone and colonic irrigation are sometimes useful.

Rectal injection of freshly expressed products from glands of internal secretion, corresponding to those showing insufficiency, may cause subsidence of the symptoms. It will be found by careful study of these individuals that their autonomic or sympathetic nervous system is always impaired and by the use of the proper organic preparation this imbalance can be overcome. This work can be most satisfactorily instituted if the Abderhalden reaction is resorted to.

Surgery has been resorted to with considerable freedom, even audacity, and in some cases with more or less benefit. It, however, should be employed only when there are positive and definite indications. The surgical removal of peripheral foci of irritation is sometimes helpful. These may be ocular, nasal, pharyngeal, gastrointestinal, or genital, and when there are definite localizing symptoms,

even brain surgery may be of advantage. Too much should not be expected, however, from surgery, for even where definite brain pressure can be overcome by surgery it is not necessarily followed by improvement in the symptoms. The removal of neoplasms, where possible, is, of course, indicated on general principles. Abdominal surgery is of very doubtful value. Temporary improvement frequently follows surgery which I believe can then be attributed to the somatic impression, as stated above, of the operative procedure rather than the removal of local irritation.

Our results depend largely upon the environment of the patient and his social level. The best results are obtained when the patient can be treated in his own well appointed home and the proper cooperation of the family obtained. Next to this is the small private institution where individual attention can be given and the patient is not subjected to emotional traumata. Next in efficiency comes the large institution devoted to the care of epileptics, but here individualization is lost and the patient is surrounded by others in a similar condition, which has a most unfavorable influence on his mental state. The least favorable conditions under which we treat these patients are in the dispensary. All responsibility is lacking and it is impossible to control or regulate their lives and their homes are, as a rule, far from desirable.

Although the outlook is now decidedly more hopeful than it was before our present knowledge concerning the action of the glands of internal secretion upon the vegetative nervous system, still, when we realize that many of these individuals begin their existence with a damaged germ plasm, we should be extremely guarded in our prognosis, and, even under the best of auspices when our results are most favorable, we should not forget that even after long intervals covering many years any strain that may be placed upon the organism of such a nature as to cause a nervous imbalance may be responsible for the return of the seizures.

CONCLUSIONS.

In our present knowledge of epilepsy we should not be dogmatic, but I believe that we can decide that there is no epileptogenous zone in the nervous system; that epilepsy is not a symptom group but a state in which there is a hypersensitivity of the cells of the motor area; and that they can be set into excessive activity by toxic substances elaborated in the organism which would not produce convulsions in a patient whose cerebral cells were not hypersensitive.

REFERENCE.

1. STARKEY: *Medical Council*, August, 1912.
512-15 KRESGE MEDICAL BUILDING.

Chronic Internal Hydrocephalus.—Charles A. Elsberg (*Interstate Medical Journal*, December, 1917) has had remarkable success with repeated lumbar puncture every few days, withdrawing fifteen to thirty c. c. each time, and thyroid extract in increasing doses up to the physiological limit. This treatment is indicated and of value only in those cases due to hypersecretion.

CONTROL OF COMMUNICABLE DISEASES IN THE CITY OF NEW YORK.*

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In dealing with this subject it is intended to speak on general lines rather than of specific conditions. If you have a general working knowledge of what is necessary under certain circumstances you will be able to apply that information to other conditions, so that the principles in the control of contagion in diphtheria, for instance, can be applied with equal success in a case of chickenpox.

The primary object of health administration is the control or prevention of infectious diseases. About twenty-five per cent. of deaths in this country are due to preventable diseases. If these can be prevented, it is possible not only to ameliorate the misery of the sick, but to save an enormous amount of the community's money and many lives for the country. Interesting statistics are given in an investigation of the economic losses in one disease, typhoid fever. Ordinarily this disease runs from three to four weeks and about ten per cent. of cases are fatal. The following figures are for the United States and cover one year. They are compiled by Professor Fisher and are published by the United States Public Health Service:

Number of cases of typhoid fever.....	157,860
Number of deaths.....	15,786
Average age of the people who died—years	25
Present value of lives lost.....	\$45,770,400.00
Potential value of lives.....	\$108,903,600.00
Medical, nursing and care, expenses in the home of those who died.....	\$49,725,000.00
Loss of wages by sick who did not die.....	\$12,282,811.00
Medical care and nursing for those who did not die.....	\$118,395,000.00
Loss of production during illness.....	\$6,487,400.00
Typhoid fever cost the U. S. in this year the enormous sum of	\$325,534,355.00

Now, when you assume that typhoid fever is only one of the major classes of infectious diseases which have this fatality and frequency of occurrence, you can understand what an enormous loss there must be from all of the infectious diseases.

In order to prevent communicable diseases it is necessary to have efficient Federal, State, and local health cooperation, efficient and scientific health laws administered uniformly and properly, and citizens everywhere educated to the importance and necessity of their thorough appreciation. The budget of the city of New York, as far as health matters are specifically concerned, amounts to a little over \$3,500,000 annually. This enormous sum of money of the taxpayers is spent for one definite object—the prevention of disease.

Today, it is generally accepted that any one who is sick of an infectious disease is a source of infection. Excepting in a few instances, it is universally admitted that it takes a sick person to make a well person ill of an infectious disease. Therefore it is plain that man's greatest foe in this regard is man himself and that man is the great source and reser-

voir of human infection. Formerly it was thought that water, soil, air, food, and environment in general were the causes of infection. No doubt, they are the means by which the infection is conveyed in many instances, but they are not the source of infection. The germs or minute organisms which cause these diseases may be compared in the agricultural world to the seed which reproduce the grain, like wheat, corn, oats, etc.

There have been many eras in medicine and some have been great and marked with wonderful discoveries but progress has been slow and steady, so that today we feel that we are on the right track regarding the specific cause of infectious diseases. The germ theory appears practical and it is felt that more is known today about dissemination of disease than was ever known before. The clearing of Cuba of yellow fever and Panama of malaria are instances of the practical application of the facts of this knowledge, but in wise old New York we cannot control diphtheria, of which we know the cause and the method of spread and have a safe, sure, and certain preventive and cure. There is more known about diphtheria than about almost any of the other infections, yet it appears nigh impossible to control this disease. Why?

There are about 15,000 cases annually in this city with about 1,300 deaths, most among very young children. All of the factors of economics and sociology should be brought to bear here in spite of the complexities of the situation. The knowledge that most infections are spread from person to person brings in many very perplexing and embarrassing situations. The task is made more difficult rather than more easy by the entrance of these factors. One can control their environment arbitrarily, but the control of man himself requires the consent of the governed. In preventing infection, in order to conserve the public health, the rules and regulations governing such authority should have the force and effect of law. Many think that this control concerns only the department of health; let me assure you that this is not a fact. All of the many departments of the municipal family are concerned in the prevention of infection. For instance, the police department, the tenement house department, the department of public charities, the street cleaning department, the department of correction, the civil service department, and the law department are all directly and indirectly concerned; each department in its own sphere and as required by the statutes exercises influences on both prevention and control of infection. As an individual one probably has knowledge and ability sufficient to look out for himself, but when the matter concerns not only oneself, but also one's family, relations, and neighbors, there is need for a factor that can act as an executive and here the factor is the department of health which concerns itself directly in preventing and controlling infectious diseases, in fact all sickness and injuries which injure health, especially public health.

The department of health has practically two purposes: one to provide ways and the other to provide means to prevent disease. Providing the ways and means is divided into two huge divisions: 1, securing the necessary funds, and, 2,

*An address delivered to the city employees at the Municipal Building of the City of New York, November 21, 1917, under the auspices of the Committee on Education of the Welfare Committee of the Borough of Manhattan, Leonhard Felix Fuld, Ph.D., chairman.

devising such regulations consistent with scientific knowledge as will best serve not only in disseminating information but in requiring citizens so to conduct themselves as to prevent and control infection. The securing of the necessary funds is done through the budget and the material for the budget is prepared on what it is intended to accomplish in the coming year. Every citizen has the right to criticize the appropriation of funds, yet how very few really interest themselves in this matter! The second feature of the department of health's work, providing ways of accomplishing results, does concern each and all and here many are at times personally very much interested. The best results are shown in the reduction in the number of cases and in the reduction in the number of deaths. Do not be deluded by the statistics, for there are many fallacies to be found here.

The Board of Health of this city was organized about 1860. Previous to this it was in embryo and the various functions were exercised by sanitary inspectors, but we are informed that such an arrangement was unsatisfactory as is attested by a committee of citizens criticising the grafting conditions which prevailed, the report stating that while many of the officials were well qualified to act, the work on the whole was not satisfactory. In 1866 the Metropolitan Board of Health was organized as the health tribunal of the city and here we also learn from the records, that a large percentage of the health officers were keepers of disreputable grog shops or corner grocery stores which sold rum. There were different organizations for the different towns and villages around the bay and there was and could be no harmony and concert of action in resisting the common dangers to health of the whole district. In 1898 the counties of New York, Kings, Queens, Richmond, and part of Westchester were consolidated and from that date comprised the jurisdiction of the New York City Board of Health. Until 1870 the Sanitary Bureau administered not only the details of surveillance and control of sanitary matters but also supervised control of contagious diseases.

It was natural that the changed conditions regarding contagious diseases introduced chiefly through bacteriological discoveries in the '70's, '80's and '90's, would be reflected in the more rapid development of the medical work of the department of health. The date of the organization of the division of contagious diseases does not stand out in the records. Apparently it was a gradual cleavage. In 1905 on taking up the work in tuberculosis, following the then accepted bacteriology of the cause of tuberculosis, which was incident to the brilliant discoveries of Professor Koch, of Germany, the division of bacteriology was initiated. Shortly thereafter in 1913 this division was amalgamated with the division of contagious diseases forming the division of infectious diseases, and in 1914 with the inclusion of work in industrial conditions the title was changed to the Bureau of Preventable Diseases. The Bureau of Preventable Diseases was divided into divisions, in order to place in control trained officials and to administer uniformly the work throughout the five boroughs.

There were the following: 1. The Division of Contagious Diseases, later styled Infectious Diseases, supervised the work in all contagious diseases, except tuberculosis, typhoid fever, and malarial fever. This also included ambulance service and disinfection. 2. The Division of Tuberculosis had its branch offices and clinics scattered throughout the city; also a Hospital Admission Bureau and several day camps. 3. The Division of Institution Inspection supervised and made uniform the registration and supervision of the handling of infectious diseases in hospitals, dispensaries, sanatoriums, etc. 4. The Venereal and Veterinary Division was specially segregated in order to develop this work according to lines indicated and to advance the registration of venereal diseases and investigate the class of persons advertising as specialists in the "cure of venereal diseases," and if possible prevent and stop fraudulent practices on these sufferers. It is gratifying to report that this division has established itself, has done splendid work, and has shown by abundant instances the necessity for continuation of such efforts. 5. The Division of Typhoid Fever, now the Division of Epidemiology, studies specially the epidemiology of infectious diseases. 6. The Division of Nurses gives uniform instruction and supervises the nursing staff. 7. The Diagnosis Laboratory determines the presence of infectious diseases by microscopical examination of specimens submitted.

The bureau had five borough offices, one in each of the boroughs, in charge of a borough chief, these borough offices supervising the work of the local branch offices and clinics. There have been so many changes in this bureau within the past three years, that hardly a division is now conducted along the original lines, changes having been made necessary by the revision of the methods of control of the contagious diseases based on advancing knowledge of these diseases. Science makes advances, these advances are as a rule improvements and require careful consideration. Revising, amending, and reducing regulations is as a rule of great service both to the public and the department of health. The functions of the control of the communicable diseases it will be seen are intrusted to several groups, each subordinate to an executive, who in turn is subordinate to a local chief, who is responsible to a director, who reports directly to the commissioner of health.

The duties of the Bureau of Preventable Diseases, in so far as they concern the prevention and control of the communicable diseases, are about as follows: 1, the registration, investigation, and sanitary supervision of all infectious, or communicable, diseases; 2, the enforcement, subject to supervision by the board of health, of the Sanitary Code provisions, of matters relating to the control of the infectious diseases; 3, amplifying the regulations providing information for the guidance of the public, physicians, institutions, and schools, in matters relating to infectious diseases.

The prime requisite in the control of infection, is strict observance of the statutes of the State of New York, which require persons having knowledge, physicians, midwives, etc., to report cases of

infectious diseases. Having knowledge of the presence of contagion, efforts can be undertaken to prevent the spread; these reports are also valuable for statistical purposes. Hence, between sanitary supervision and registration of cases we are able to inform the public regarding the existence of infection and not only may local measures be instituted but others elsewhere may be enabled to start protective measures. The department of health cannot know of infection in the absence of notification. While it is true there are many ways of finding out where such cases are when not reported, still it is the duty of all, especially all law abiding citizens, to comply with the statutes. There are doctors who feel that knowledge of a disease in a patient is "privileged information," especially in the venereal diseases, which they should not be called upon to impart, but as long as legal notification is required in such instances, it is the duty of all to obey or make a test of the constitutionality of such a law. Your attention is especially called to this condition because many families resent physicians performing their legal duty and if it is generally known that this is a legal requirement there are but few who would desire to be placed in the position of compounding a misdeed.

In addition to the legal obligation of the doctor, there is a moral one which physicians must recognize. Every physician has a number of families who look to him not only for treatment but also for reasonable protection from disease. The failure to report the occurrence of a communicable disease in one patient may lead to the development of this disease in others whose rights he has thereby ignored. Failure to report a case, therefore, violates the spirit and the intent of the law which concerns the ethical principle of protection and the rights not only of the sick but also those of the well. Notification is in the interests of the community and a doctor's patients are a part of this and by his failure he ignores their interests. The doctor who does not report his cases may very justly be considered as obstructing public health administration. The proper function of the physician is to prevent disease rather than to try to cure it. Physicians' duties, therefore, become more and more clearly official in the presence of communicable diseases and under these circumstances the first duty of the doctor is to the community and not exclusively, as it would at first seem, to his individual patient. In China, we are informed, physicians are paid to keep their patients well and are not paid when they become ill. Conditions appear to be shaping themselves in that direction in this country.

A great fault with the present procedure in controlling contagious diseases is the time lost from business by reason of infection in the home. For instance, a person engaged in handling food or milk may not work if the sickness occurs in his home. In some countries, as in England, persons who lose their employment by reason of segregation are paid a certain sum while so restricted. If we paid persons arbitrarily removed from their positions by reason of isolation for infectious disease, this no doubt would help improve conditions and might remove many of the obstacles in securing

good quarantine. Another hardship is encountered by persons living in apartments or tenements for here the landlord and the neighbors have to be reckoned with. Complaints no doubt are due to ignorance of the law but if it is remembered that the source of the infection is in the patient and that if the patient is isolated properly, there is no danger. Communication between the patient and those outside, however, must be prevented and this is difficult, especially when children, pets, or insects may be the medium of conveyance. You must prevent the cat, the children, and others from coming in contact with the sick and then going out among others who are susceptible.

In the poliomyelitis epidemic of 1916, it might be stated with truth that in spite of the fact that there were nearly 9,000 cases with about 2,400 deaths, the great fright occasioned by this dreadful malady prevented the spread of other infections and that while there was an increased number of deaths from an unusual disease, the city's gross death rate was not increased but was actually lowered in consequence. This is explained by the one fact, that the precautions taken to prevent the spreading of poliomyelitis actually reduced both the number of cases of other communicable diseases and the general death rate. Scourges therefore serve a useful purpose, though they cause a great deal of alarm and misery. Shocks of this character are necessary to bring people to their senses and awaken them to an appreciation of the dangers of ignorance and promiscuous contact.

The contagious diseases for the purpose of control are divided into groups in this city. The major group includes: typhus fever, typhoid fever, smallpox, diphtheria, croup, tuberculosis, scarlet fever, poliomyelitis, pertussis, cerebrospinal meningitis, and the venereal diseases. The minor group includes those diseases with rather slight mortality, such as German measles, chickenpox, mumps, and the like. The infrequent and rare diseases, when they occur, are placed in the first group. These include: yellow fever, trachoma, tetanus, rabies, plague, cholera, hookworm, trichinosis, leprosy, foot and mouth disease, and glanders. There is a special group of skin diseases which are contagious and which concern medical school inspection, as scabies, or the itch, ringworm, and vermin, or pediculosis.

For practical purposes, the regulations for the control of contagious diseases are very simple. They include only such requirements as will prevent contact between the sick and the well. These requirements are about as follows: 1. Every case of infectious disease of whatever nature must be promptly reported in writing. 2. Every case as soon as suspected by any one must be at once segregated, or placed apart from others. 3. Perform such disinfection as will destroy all infection. 4. Remove to special hospitals all patients sick of infectious diseases who either cannot or will not be effectively isolated. 5. Remove from quarantine only after compliance with regulations to see that the body of the patient is free from infectious material and the quarters occupied when ill are properly cleaned. Termination of a case of infectious disease is en-

tirely subject to municipal control. 6. In burial of the dead, funerals should be private, the remains being enclosed in a coffin and sealed as speedily as possible. 7. Education and methods of instructing the family and the public regarding infection, by lectures, literature, moving pictures, lantern slides, courses in the various schools, and publicity through the press and other sources, no doubt will in time reach many to whom it may be of considerable service and then when the public know and appreciate what is necessary, considerable may be accomplished in the control of contagion. In conclusion let me most forcibly impress upon all the great necessity for knowledge of infection and in its presence the need for practising those precepts.

143 WEST 103D STREET.

PRACTICAL POINTS CONCERNING DIPHThERIA.

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The more intimate the relation of field work and laboratory the more easily does the control of diphtheria become. In clearing up many minor perplexing problems of both the field and the laboratory, I can state that only when the field worker has direct charge of the laboratory can effective work be accomplished. There are a number of points which may well be emphasized both for the physician and the laboratory worker.

As the field worker may frequently see cases of the disease much earlier than the physician, I wish to emphasize a few points of diagnosis, as textbook pictures are based on the average case seen by the physician. Contrary to the textbook description, the true membrane in its earliest formation does peel off readily with swabbing and without leaving a bleeding spot. Again, in early cases the membrane, which may be the size of a pinhead, is surrounded by a very typical hyperemic areola. This areolar band is always comparatively narrow and may be an incomplete circle. Contrary to the textbook teaching, the fact that a membrane on the soft palate or uvula is not always diphtheritic is not a contraindication for giving an immediate large dose of antitoxin, but it is an indication that it may be a truly streptococcus septic sore throat. As such while the antitoxin has done no harm, positive cultures for the streptococcus or negative diphtheria cultures give information that may prevent future complications, and even deaths. Such cases should be known to boards of health for prevention of other streptococcal infections. When seen early, these cases present a general filminess rather than a tenacious membrane. In general, physicians should be shown that the deeply congested membrane of the whole fauces with membrane or ulceration if an acute infective history is reliable, is more apt to be primarily streptococcal. When secondarily that infection, symptoms usually point to an unrecognized diphtheria of at least several previous days. Antitoxin in one good dose even by

the vein is good treatment at the time. Better treatment where there is any suspicion that it is not purely diphtheritic, will combat a streptococcal infection more often fatal because unrecognized and as insidious as diphtheria in the rapidity of its septic manifestations. In this connection there is a practical point not at all recognized by the average physician. Not only should he protect his patient by being absolutely sure that the throat culture is taken under his strict observation, never losing sight of the procedure for an instant, but he must be sure that care is taken to work the swab end under the edge of any membrane and rub between that membrane and the wound area. Thus a correct diagnosis may be made for him, barring the human fallibility of the laboratory worker. This will be discussed later. It is not rare for the laboratory to report diphtheria in a typical case of tonsillitis. We have to deal with two situations here. In some cases, true diphtheria may start as an apparent lacunar infection, in a few days showing the coalescent membrane that is more typical. Attention to the fact that the points presenting in the lacunæ are true membrane and that a beginning hyperemic areola is present around some of the outer ones generally gives a clue as to the clinical diagnosis. The remainder of the cases are exceedingly interesting ones of true carriers. These latter will be taken up in the discussion of the laboratory end.

One practical point on treatment is less appreciated today than in the past. I believe that the tendency to rely on antitoxins and serums is responsible for a belittling of the medical treatment. The red, angry acute throat with exudate that reminds one of neglected diphtheria, either of scarlatina or truly septic sore throat, certainly subsides more quickly under the administration of potassium chlorate and iron than under any treatment I have ever seen given. A minimal dose every hour, attention being paid to keeping the bowels free, will be retained by the most sensitive stomach. This has been a favorite prescription as far back as 1700, and I believe that many septic sore throats formerly called diphtheria, as well as streptococcal throats secondary to diphtheria, did well because of its use.

Forms simulating diphtheria without the intensity of congestion, recurring especially in childhood, are generally due to a different streptococcus and definitely related to acute articular rheumatism. The salicylates are as effective when used in physiological dosage as when exhibited for acute joints. There is a wide field for early drug treatment fortunately, inasmuch as whatever the size of the patient, either complaints or signs point to the throat much earlier than in diphtheria. Today as never before the practising physician should pay attention to excoriating nasal discharges, especially unilateral ones. Appearing in one who has had diphtheria, he should isolate the individual at the time. He may thereby prevent even one case of the disease from following this carrier while waiting for the culture result. He has accomplished even greater prevention should the culture be a streptococcus. Equally important are similar nasal discharges following trauma and operative procedures on the nose and in those with septal deformities,

even in those who never had the disease. Such carriers are an indication to the epidemiologist that another carrier is responsible for this one being made a carrier. When physicians see these nasal carriers in children whose parents run a tailor shop or a grocery store, the mystery of suspected contamination by garments or food is dissipated and the case is traced to contact with the carrier in the store. Increasingly responsible then is the physician who sends the remainder of the children to a relative or out of town that they may not contract the disease. Only too frequently the carrier is among them and does further damage, unfortunately laid to bringing the germs from home in their clothes. Equally startling are the cases found where the carrier has just moved from another locality. In traveling half way across the continent by train, contrast the sneezing range of the carrier's dripping nose with imaginary articles handled by the victim. A tremendous responsibility rests on the detective force of any board of health. Clues given by citizens to police detectives help clean up mysterious and widely separated burglaries by the same individual. Similar leads should be given to the board of health by physicians.

No less responsible is the laboratory for the accuracy of diagnosis for cultures. Human fallibility may be lessened in larger laboratories by two or more independent observations. It may be a matter of stain as well. Some may have settled on Loeffler's methylene blue with or without Neisser's for corroboration. The stain which I recommend, a modified Gram stain, was published by a worker in the United States Navy and is as follows:

Saturated alcoholic solution gentian violet....	25
5 per cent. solution formalin.....	75

The solution as given forms the basic stain, the remainder of the technic is that of the usual Gram stain. Personally I use safranin as a counter stain in preference to Bismarck brown or fuchsin. If this stain is also used the advantage of both previous stains will be combined. Further, if the epidemiologist, not content with negative findings, will follow positive findings for what appears morphologically predominant or possibly in pure culture into the outside field, preferably in person, I contend that such findings will solve all the problems of infectious diseases. One seldom hesitates to diagnose with typical diphtheria bacilli. The involution forms, especially the barred and solid forms in general, resolve themselves into two classes. First, true diphtheria may be present where the swab has been rubbed on the membrane giving old bacteria, as proved by direct cultures from the wound surface giving in the same case the typical young type. Undoubtedly this accounts for the great number of positive cultures when the throat is clear. The second class in which repeated cultures from a clinical lacunar sore throat continue to show these forms is most interesting. Investigation of the case proves them true carriers with the nasal condition missed by the physician. Cultures from the nasal discharge in a series of cases have shown the typical form of the diphtheria bacillus. There is little question in my mind that the entire phase of the Westbrook types may be solved by correlation of

these factors; where in the case is the culture taken from, and where in the carrier.

There are many practical points that the field worker or epidemiologist should recognize. After having been content for two years with demonstrating an active carrier responsible for the reported case we have come to recognize that the personal history of that carrier is essential in determining whether further cases are to develop in the following way. When the carrier is an acute one who has never had the disease, experience has taught us to keep hunting for the carrier that made that one a carrier. If the latter is a chronic one and has previously had the disease, we have reached bottom and have only to demonstrate that the latter individual has caused no cases and is the only fresh carrier to be free from the disease for months or even a year. A concrete example is as follows:

CASE.—A laboratory culture in the case of a boy gave F2 G2 (Westbrook). Examination showed a left sided anterior typical nasal discharge with typical diphtheria bacilli present. A younger sister had had a suspected attack of diphtheria some three years previously, while another sister, age two years, showed a sanguineopurulent discharge from the right anterior nares. The mother stated that the latter had been present but a few days; that that of the boy was a chronic affair of several years, always starting in the early fall as a head cold and persisting off and on through the winter; and that treatment by physicians had been of no avail. The high frequency of cases beginning each fall and going through the winter in the immediate neighborhood in every direction for three to four blocks had during my three years' previous experience been an unsolvable puzzle. On finding this boy, age eight years, and a newsboy, in early September, he was isolated in one room for nearly one month. For the first time in three years there was neither a reported nor a found case of the disease in the neighborhood, although there were many cases elsewhere in the city where the epidemic of measles among young children started, until I was able to round up a gratifying number of carriers.

The last point I wish to make is that measles in epidemic form is a blessing in disguise. I have recently shown that the hitherto unaccountable frequency of mild nasal diphtheria is due to carriers who have had diphtheria previously and who, together with the self-inoculated nasal carriers who never had the disease but are now secondary carriers, can be found in numbers sufficiently great to account for the high frequency of diphtheria after measles. In the search for these carriers you may find the explanation of why numerous children in a family are immune. They have been made nasal carriers and as such never developed the disease as I have shown. I have yet to reverse my judgment in a single instance. The rapidity, the greater surety of work, together with quicker and more accurate results far outweigh reported results from the Schick test.

To sum up: Look among the contacts of your patient for the carrier. Then look among the contacts of that carrier for the carrier who made him one. Waste no time over the patient until he is well and ready for contact with the outside world. When the anatomy of each carrier's nose as well as the patient's is determined by the passage of a sound which is a nasal swab, varying grades of stricture form the record as to whether that case may again later become a carrier from further inflammation or trauma. Fresh carriers and cases

can be prevented if we have a record of the individual at this later time. Physicians, bacteriologists, and epidemiologists all have their responsibility in the prevention of diphtheria. Of them all the last class of workers have it in their power to control diphtheria absolutely if the former two sets will refer all the atypical cases as well as the typical.

36 HIGH STREET.

EXANTHEMATOUS AND OTHER FORMS OF INFLUENZA.

BY BERNARD FRANKEL, M. D.,
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During the past few years I have had under observation and treatment numerous cases of influenza accompanied by eruptions, which, although frequently diagnosed and even placarded as scarlatina, measles, or German measles, did not present the clinical picture of any, but rather a combination of symptoms of these diseases grouped in an irregular and atypical manner. They were usually found to have originated from the contagion of influenza and, following catarrhal symptoms or not, would show a more or less profuse rash either of the bright, punctate, scarlatina like variety, or one that was blotchy, of a darker hue, and not unlike the rush of measles.

These eruptions develop and spread in an irregular manner over the face, extremities, and other parts of the body, sometimes remaining discrete, at others becoming quite profuse; they may persist for several days or disappear rapidly, but sometimes will reappear repeatedly after longer or shorter intervals. The elevation of temperature may be slight or pronounced and its course very irregular, marked with frequent remissions, intermissions, violent exacerbations and relapses, a feature which is generally very characteristic of influenza in all its various forms.

The general course of these exanthematous forms of influenza is also very irregular and frequently does not correspond to that of the disease simulated by the eruption of each particular case. Thus with a rash resembling that of measles we may miss the prodromata, onset, and other symptoms of that disease; there may be no catarrhal stage, no Koplik's spots, no conjunctivitis, and no respiratory involvement; but in their place we may frequently find accompanying such an eruption a scarlatina like angina with involvement of the cervical glands, often progressing even to suppuration and to the formation of deep seated cervical abscesses.

On the other hand with an eruption resembling that of scarlatina we may have no angina or nephritic complications, but, instead, respiratory complications, often leading even to bronchopneumonia; or digestive disturbances may become very prominent and so serve to simulate at times cholera morbus, at others dysentery (1), or even present symptoms that might justify the suspicion of typhoid fever as was illustrated by a case I described in a former article (2). My diagnosis of that case as influenza was corroborated by Dr. L. Emmet Holt. The recent reports of epidemics of measles, scarlet fever, mumps, and pneumonia from some of

our military training camps make me strongly suspect the influenzal origin of many, if not of most of these cases. As long as exanthemata of influenza are not recognized as a clinical entity of quite frequent occurrence, a physician, when brought face to face with such eruptions, not due to digestive disturbances, has no choice but to diagnose them as measles, German measles, or scarlatina even of an irregular type.

Failure to quarantine the noneruptive forms of gripe favors its spread among soldiers in barracks; while unguarded exposures, against which I have warned most emphatically (3), during outdoor training of those affected with gripe, frequently transform a mild attack of influenza into one complicated by a sometimes even fatal pneumonia. The following measures therefore seem to me to be of the greatest prophylactic value, viz.: 1, strict quarantine of every case of influenza, and 2, prevention of complications through unguarded exposures by keeping the patient, in every case of influenza, at rest in a moderately warm and well ventilated room until the complete disappearance of all the symptoms and the return of the temperature to normal for a few days in succession.

Among complications and sequelæ of various forms of influenza I have seen more or less severe attacks of acute, subacute, or chronic synovitis, arthritis, myositis, neuritis and also myocarditis and endocarditis. They are usually diagnosed as rheumatism of mysterious origin, and in common with many other forms of rheumatism of obscure origin are undoubtedly caused by the deleterious action of the streptococci of influenza and of their toxins. As previously stated (1, 3) I hold with Dr. George Matters (4) and Doctor Moody (5), of Chicago, that streptococci, and not the Pfeiffer bacilli, are the pathogenic germs in the greater number of cases of influenza.

With those forms of influenza involving mainly the respiratory system there frequently develops a peculiarly irritating, dry, paroxysmal cough of such marked persistence and severity as to leave the unfortunate sufferer not a moment's rest day and night. When very prolonged these individual paroxysms may induce vomiting or even hemoptysis. I found these severe paroxysmal dry coughs of gripe very characteristic of that affection, manifesting a marked tendency to chronicity and persistent recurrence after exposures for many months and even years. If not treated very energetically from the beginning and not guarded against exposure for a sufficient length of time these cases tend to become complicated by chronic bronchitis, asthma, bronchiectasis, pulmonary abscess, and at times by repeated attacks of more or less severe hemoptysis during each recurrence of the severe dry paroxysmal cough following exposures for many years after the original attack. Being often also accompanied by a marked loss of weight and failure of the general health some of these cases are readily mistaken for pulmonary tuberculosis and the patients may even be placed in tuberculosis institutions, where their predisposition exposes them to the grave danger of actually contracting that dreaded disease. The fact that repeated sputum examinations in these cases invariably show absence of any tubercle bacilli has

in my experience not sufficed to prevent such at times fatal errors in diagnosis. I have therefore repeatedly urged a thorough reexamination in tuberculosis institutions of all supposedly tuberculous patients, whose sputum repeatedly fails to show the presence of any tubercle bacilli, for the purpose of removing those found to have been erroneously diagnosed as tuberculous from those dangerous, for them, surroundings (3). In a paper on bronchiectasis Dr. Thomas McGrae, professor of medicine at Jefferson Medical College, in Philadelphia, and Dr. E. H. Funk, associate professor in medicine at the same college, cited cases of advanced nontuberculous bronchiectasis—one was proved on autopsy to have been such—which were erroneously diagnosed as pulmonary tuberculosis and kept in tuberculosis sanatoriums despite the absence of tubercle bacilli in their sputum (6). They therefore warned earnestly against classing any advanced pulmonary troubles as tuberculosis when repeated examinations of the sputum showed absence of tubercle bacilli.

It is therefore incumbent upon diagnosticians to employ in doubtful cases suspected of tuberculosis all the modern scientific methods, including roentgenology, complement fixation tests, etc., before making a positive diagnosis of pulmonary tuberculosis on the basis of auscultatory or percussion signs only.

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1234 MADISON AVENUE.

Abstracts and Reviews.

FOOD BORNE INFECTIONS.*

By EDWIN O. JORDAN, Ph. D.,
Chicago,

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Gastrointestinal disturbances traceable to some food eaten shortly before the attack, the lecturer stated, were of very common occurrence. Such upsets were commonly declared to be due to ptomaines and this was, by most persons, thought sufficient explanation of the symptoms, the theory being that the food had been kept too long and that the proteins had undergone bacterial decomposition resulting in the production of ptomaines. Belief in this theory had declined, however, owing to the fact that the most recent researches on the subject proved without doubt that such proteins were formed only in the late stages of decomposition. Such food would certainly be condemned before consumption on account of its damaged appearance, before the state of ptomaine production was reached. The responsibility, therefore, could be definitely placed upon other factors, namely: 1, bacterial toxins or the end prod-

ucts of decomposition, and, 2, infection with specific bacteria. The toxigenic organisms no doubt gave rise to specific poisons, although little is known how they find their way to food products. Of the outbreaks due to *Bacillus botulinus*, seventeen occurred in California, which would show that these infections had a regional distribution. Although these outbreaks were not very frequent in occurrence a great number of individual cases were reported. These were certainly due to some bacterial poison. Milk, as commonly used in the household, was loaded with bacteria, but it was necessary to distinguish between the harmful and the harmless varieties.

It might be stated that there were two classes of food prone to infection: food contaminated without human intervention and food directly contaminated by human beings. In the latter case, infected fingers or mouth spraying might cause infection, though not so commonly as believed. Persons seriously ill with contagious disease were usually in bed and were incapacitated from serving or handling food. The danger here lay in cases of mild, atypical forms of an infectious disease, such as typhoid, where a patient, with very slight symptoms, could spread infection of a virulent type to many others through handling of food. Convalescence also often constituted a grave source of danger; sufficient care was not taken to quarantine the patient until noncontagious. For instance, in a case of diphtheria it was impossible to state exactly when the germs disappeared. Typhoid patients also were often released from hospital while still discharging typhoid bacilli from the bowel and the bladder. Sufficient precautions should be exercised and convalescents should be warned of danger in this respect to the rest of the community. There was no rule of thumb, unfortunately, by which one could state the termination of the infective stage. The term "carriers" had been applied to persons in whom a specific infective germ persisted microscopically, without clinical evidence of the attack. This was a particularly insidious mode of infection. Healthy persons in contact with infected patients became carriers and thus a source of danger. It was highly necessary for the health of the community that food products should be handled only by healthy persons who had not been in contact with infective disease, although the number of diseases likely to be conveyed by these agencies was limited. Typhoid and paratyphoid could be conveyed in milk, but were rarely transmitted by other foodstuffs. In scarlet fever and streptococcus sore throat the germ was introduced into the milk from human sources, sometimes through a secondarily infected cow. Tuberculous infection might be transmitted through milk, although this was not easy to prove.

Technical difficulties in tracing the sequence of events, however, should not be allowed to override analogies to transmission of other disease. In an examination in New York of 1,980 food handlers, ten tuberculous persons had been found and removed. It was possible for pathological bacteria to multiply in food, though as a rule they did not multiply outside of the human body. In many conditions foodstuffs offered mediums similar to those employed for laboratory cultures. Fresh food caused no in-

*Abstract of an address delivered December 31, 1917, at the annual meeting of the American Association for the Advancement of Science, Section K, Experimental Medicine, at Pittsburgh, Pa.

jury but, after standing twenty-four hours, could produce illness. Thus meat jellies, meat pies, etc., if prepared for the table and then allowed to stand too long, might become infected. Cooking instead of killing the germs might, on the contrary, act as an incubatory agent, as, for instance, in the California outbreak, due to baked spaghetti. In this case the temperature in the interior of the dish favored the growth of the germs instead of destroying them. The growing of vegetables in contaminated soil might prove a source of infection, such as typhoid; and the practice, said to be on the increase, of fertilization of soil with human excreta, would favor this. Salad, cabbage, etc., thus infected, could not be cleansed of infecting agents by the ordinary means of washing.

To the second class of foods, said the speaker, belonged those contaminated at the source of origin. It could be said here that food plants were as a rule not affected by bacteria pathological to man, with the exception of "bud rot" of the coconut, the germ of which resembled in form the colon bacillus. Many food animals, however, suffered from bacterial infections which might be communicated to man. Of these milk was the most frequent medium; bovine tuberculosis and Malta fever, the latter conveyed by goat's milk, fell into this category of diseases. The danger was not always apparent in the condition of the animal, many infected animals appearing healthy. Meat poisoning could occur from animals ill at the time of slaughter and bacilli of the paratyphoid group were found frequently in the tissue of animals the meat of which gave rise to symptoms called "ptomaine" poisoning, although these cases were really genuine infections by specific bacteria. Beef was more easily infected than mutton, and the internal organs of animals were more apt to contain bacteria. Raw foods were particularly prone to carry infection, even though presenting a good appearance, and thorough cooking was, no doubt, the best means of prevention of infection from this source. The danger of contracting tuberculosis through meat was very slight. The tuberculous carcass was easily detected on meat inspection. Thorough cooking here would destroy germs and in any case a very large number of bacilli would be necessary to produce the disease. Though this class of infection was theoretically possible there was no direct evidence as to its occurrence. In this connection it was consoling to know that many diseases peculiar to domestic animals were not transmissible to man by means of meat. Anthrax, hog cholera, etc., while affecting animals, were not acquired by man, and man borne infections were not pathological to the lower animals.

In conclusion it could be said that the outlay expended by the Government on food inspection was not worth the money. Studies in the laboratory were five times as important and careful babies' nurses ten times as important as food inspection. Five important points in safeguarding the health of the community in regard to the food supply were: 1, pasteurization of milk; 2, the health of persons handling and preparing food; 3, examination of food animals; 4, general cleanliness; 5, fresh condition of food.

Malignant Neoplasm of the Thyroid with Metastases in the Intestine and the Bone.—Dr. J. F. Binnie, of Kansas City, Mo., presents the following case: On June 6, 1916, Mr. T. K., aged fifty-three years, presented himself with a history of intermittent intestinal obstruction of a few weeks' duration. There was now complete and evident acute obstruction demanding immediate operation. For twenty years the patient had noticed his larynx deviated to the right and that recently a small hard lump had formed in the region of the thyroid. Under gas ether anesthesia the abdomen was opened and the distended small intestine was followed in the direction of increasing congestion until a dimpled spot was reached. The dimple was the base of an intraintestinal neoplasm. There were several such neoplasms, two causing dimpling. Enterectomy was performed. The length of gut excised measured fifteen inches after preservation in Kaiserling's solution. The patient recovered. On examination on November 29, 1916, the thyroid tumor had increased steadily in size, caused no pain, but caused dysphagia and a persistent dry cough. The tumor was nodular, hard, and not adherent to the skin; it extended from the upper hyoid cornu to about one finger breadth above the clavicle and was about two inches wide. On the outer and posterior surface of the upper end of the right humerus beneath the deltoid there was a smooth, rounded, elastic, tender tumor which had developed in five months. X ray shows that the tumor had eroded about two thirds of the thickness of the humerus. A diagnosis of sarcoma of the humerus and malignant neoplasm of the left lobe of the thyroid was made.

On December 11, 1916, the tumor of the shoulder was removed, the wound healing *per primam*. On December 30, 1916, the left lobe of the thyroid was excised. The thyroid consisted of a nodular tumor of almost wooden hardness. In spite of a postoperative lobar pneumonia the patient recovered and left the hospital on January 19, 1917. On April 18, 1917, patient's weight was about the same as when he left the hospital. The sarcoma of the humerus had recurred. Nephritis was present. Professor William H. Welch, of Johns Hopkins, kindly examined specimens of the tumors and wrote: "The tumors of the thyroid and of the neighborhood of the humerus are obviously sarcoma and are similar in structure. . . . I am of the opinion that the intestinal tumor is also a sarcoma and, although differing in certain features from the structure of the other tumors, is still sufficiently like them to indicate the essential similarity of all three tumors. . . . It seems probable that the differences can be explained by the differences in the sites of their growth." It will be noted that while the tumor of the thyroid was removed about six months after those in the intestine yet its presence was observed before the acute intestinal obstruction demanded enterectomy. Thus the sequence of events favored the assumption that the thyroid tumor was primary. If the tumor in the thyroid was metastatic it would probably not have involved the whole of the affected tube, as it did in this case, but would have been in the form of a nodule or of nodules scattered throughout a mass of recognizable thyroid tissue.

Medicine and Surgery in the Army and Navy

A RESUME OF CERTIFICATES ISSUED BY PHYSICIANS IN CONNECTION WITH THE SELECTIVE SERVICE.

By FRANK C. HAMMOND, M. D.,

Philadelphia,

Secretary of District Board No. 2, Eastern Judicial District of Pennsylvania.

This article is written with the hope that it may reduce to a large extent the indiscriminate issuing of certificates by the members of the medical profession to persons endeavoring to use them for the purposes of avoiding the selective service. One would think that in the present crisis the physician would be very careful in issuing a certificate which is to be presented to the local and district boards appointed by the President under the authority vested in him by the terms of the Selective Service Law. By virtue of the experience gained from daily sessions of the district board of which I am a member, based upon 5,700 appeals, these facts are reported in order that the profession may gain some idea of the vicious practices to which some of our members have been a party. This cannot alone be attributed to indifferent members of the profession, as it includes some of the highest type who have gone out of their way in a vain attempt to prove that the registrant should not be certified for military duty. I am quite sure that every local and district board in the United States could add to the experiences of this board.

The certificates issued may be divided into two classes: 1, those attesting to certain physical defects, giving reasons why the local board should reject the applicant; and, 2, the type of certificate attesting that the dependent—wife, father, mother, etc.—is in a physical condition that precludes the possibility of the individual working, and that the registrant should be discharged in order to remain at home and support the dependent or dependents. Too great credit cannot be given to the medical examiners appointed on the local boards to examine the physical fitness of the registrants. They have labored day and night, sacrificed office hours and practice, and separated themselves indefinitely from home ties, in order to carry out this high patriotic duty intrusted to them, and it must have been a shock to these examiners to have presented to them the certificates which have been issued by the less patriotic members of their profession.

It is a sad commentary when under the present conditions of war, one can obtain so easily any kind of a certificate from some physicians. Be it to the glory of our profession, they represent a fairly small proportion, but even at that, the percentage is entirely too high. No one has any objection to a physician issuing a certificate when done in the best of faith and of mutual interest to the Government and the registrant. In fact, such should be invited. For example, a man, appealing from the decision of the local board, presented certificates from two different institutions where he had been under treatment for several years for epilepsy, attested by the heads of the institutions and the

visiting staffs. The local board had refused to accept this evidence. There were two such cases. Several men appealed because they were under treatment for active pulmonary lesions and presented certificates from State tuberculosis sanitoriums attesting to the same. The examiners in these instances refused the certificates and drafted the registrants because they were unable to detect the pulmonary lesion. Yet, a man with this type of physical unfitness is the very worst kind to send to military service and every local board should use the greatest acumen in diagnosis to obviate making an error. The family of an individual appealed because the local board refused to discharge the son when affidavits had been presented that the son was admitted shortly after examination to an institution for the insane for treatment for dementia præcox. These examples may be multiplied to illustrate that the certificates are issued in good faith and of direct value to the military establishment.

The following examples will show the unfortunate side, the apparent ease with which certificates may be obtained. The majority of the appeals made to the above district board from the physical examinations of the local boards, were as follows: vision; hearing; hernia; flat foot; heart and lungs; "weak back"; underweight. Of course, there were numerous other causes. Three men attested that they suffered from enuresis, two producing medical affidavits to this effect. One man said he had a "sore" on his chin which had remained unhealed for three years and procured a medical certificate to substantiate his claim that he was unfit for military service. In regard to vision and hearing, many of the certificates were issued by general practitioners and, of course, did not agree with the findings of the medical examiners on the local boards, although some of the local boards had ophthalmologists make their vision tests. Many of the certificates thus presented attested that the vision was just beneath that required by the Government. Many affidavits were filed in regard to hernia, the physician certifying that a hernia existed and on close interrogation the individual in many instances admitted that a "lump" never had been present, showing that the bowel had not descended through the ring.

Several affidavits were presented of "threatened rupture." Upon investigation we ascertained that the family physician was of the opinion that a patulous ring existed and felt quite sure that the duties incident to military life would force the intestine through. In one instance, certificates to this effect were produced from two of our best practitioners, although six medical examiners on the local board stated they were unable to find an abnormal condition. Any number of certificates were submitted in regard to flat foot, which were absolutely absurd.

Now that medical advisory boards have been appointed to examine all registrants referred to them, it behooves the profession to discontinue the issuing of unwarranted certificates, because the personnel of the medical advisory boards will consist

of specialists and the "family doctor" will be placed in a more embarrassing position than heretofore.

The second rôle played by the physician is in the issuing of a certificate to accentuate the physical unfitness of the registrant's wife, parents, and other members of his family in order to strengthen the claim for discharge or exemption on the grounds of dependency. Abstracts are herewith submitted from these certificates with comments on some of them: "Is sickly and unable to work." Many of this character were submitted. It is hard to believe that physicians would issue a statement of this character. "Has inward trouble." It was rather surprising the number of certificates of this character that were presented.

"Has stenosis of internal os. I have done two curettements and intend to do another in a few days and it will be at least one year from that time before she will be able to do any work." This certificate was issued by one of the best known surgeons of this city, palpably so to render every aid to the registrant to avoid the draft. This certificate was presented to show the dependency of the wife. "Has neurasthenia (inherited) and threatened epilepsy." This was issued to strengthen the dependency of a recently married woman. On questioning the physician who issued the certificate, he stated that this woman was "threatened" with epilepsy because her mother is an epileptic. "Is afflicted with pregnancy." No doubt there are times when pregnancy proves to be an affliction. A surprisingly large number of certificates were issued stating "in a family way," or "is pregnant," or "is with child," or "is in a maternity way," without making any reference to the period of gestation.

It is of interest to note the large number of certificates with affidavits attached testifying to pregnancy which on investigation disclosed, 1, a very large percentage of diagnoses being made at six weeks; 2, many instances based on history alone; and 3, a large number, when the physician found his certificate was being questioned, stating that the diagnosis was based entirely upon a physical examination. The diagnostic skill and acumen of the obstetrician and gynecologist have been challenged by the number of general practitioners who can make a positive diagnosis of pregnancy at six weeks, whether the patient is a primigravida or a multi-gravida. Many instances occurred in which certificates were issued when a woman had just "missed a period," not later than thirty-six to forty-eight hours having elapsed. Yet upon this history alone, many physicians issued a sworn statement that the woman was pregnant. Quite a few certificates were presented to the effect that the wife was "about to become a mother." Upon investigation, these cases were disclosed to be pregnancies anywhere from a "missed period" to pregnancy at term. One would hardly credit that a physician would wilfully mislead in this regard.

One physician, the brother-in-law of the registrant, issued this certificate in regard to the registrant's wife: "Has gout of both feet and unable to wear her shoes; therefore, will not be able to work to support herself." The registrant in this case has an independent income; the wife is known to have

enjoyed herself to the fullest extent all summer at a nearby seashore resort. The registrant's mother has a very substantial income and the wife's father and mother were well able to support the daughter previous to marriage and could continue to do so. Yet all three of these filed affidavits that they were neither able nor willing to support her, if her husband was certified for military service. This is the only instance of this kind presented to this board in 5,700 appeals adjudicated.

"Patient unable to work for days at a time." This certificate was issued to support the claim of a widowed mother. The Department of Justice investigated this certificate and reported that the woman worked for a corporation and their books failed to show sufficient evidence of absence upon her part during the past four years to affect her weekly wage. The Department of Justice recommended that the physician accordingly be prosecuted. "Nervousness and stomach trouble." "Intestinal trouble caused by a strain." "Obesity due to hypothyroid secretion and hypoovarian secretion." Many certificates were presented attesting the woman to be "delicate" or "in a delicate condition," which proved to be a misleading phrase. Upon investigation, many of these instances proved to be pregnancy. The remaining ones meant anything, being a blanket term, leading to confusion.

"Unable to support herself on account of pelvic congestion." "Under my care and treatment." "Suffering with condition following confinement." This certificate was issued by the medical member of a local board whose experience with the board should have warned him of the error he was committing. It was surprising the number of recent marriages, within the past few months, in which the husband filed certificates attesting the wife to be "sickly" or suffering from "general physical weakness." A very large number of certificates were presented to prove the parents were dependent on account of "rheumatism," "poor eyesight," "flat feet," "unable to work," etc., and it was surprising to find the number of parents considered "aged and infirm" between forty-five and fifty years of age. In one instance the registrant refused to file a physician's certificate in regard to a dependent brother, but presented a certificate from a druggist and a similar one from an attaché of the associated press that the brother "was an epileptic" because they had seen him "in the fits."

If the local and district boards exercised the power invested, many physicians could be brought to trial and convicted for aiding and abetting in avoiding the Selective Service Law, but the boards have been very lenient and accomplished their purpose without resorting to these drastic procedures; however, those culpable should be on their guard. With the country facing the greatest war of its history, fighting for its very existence, it is deplorable that some of the members of the medical profession can be so easily prevailed upon. Our profession, always the first to volunteer its life and blood for country, should not be so easily stigmatized by these thoughtless members.

1729 ARCH STREET.

THE FIRST LINE DRESSING STATION AND
THE FIRST DRESSING.

BY GEORGES BILLOT, M. D.,

France,

Surgeon Aid-Major, 36th Infantry Regiment.

To my mind, the objects to be attained by the first dressing are the control of pain, hemorrhage, and infection. As far as pain is concerned, the beneficial effect of the first dressing is unquestionable. This is especially evident in cases of fracture which have been comfortably immobilized and of large wounds with extensive tissue destruction which have been carefully cleansed and dressed at first line dressing stations. This sedative action is due partly, perhaps, to the psychic effect, but more particularly to the fact that the nerve endings exposed in the wound have ceased to be irritated by the air, sun, foreign bodies, etc. This effect, is, however, of relatively short duration, since it disappears as infection develops. With the formation and blocking up of pus the pain soon becomes sharper than at the time of the injury.

In wounds of warfare hemorrhage is met with in all degrees and forms: arterial, venous, and capillary, in jets, oozing surfaces, etc. At dressing stations the hemorrhage is, of course, always primary. It may seem paradoxical that the largest wounds with most extensive tissue destruction are always the ones that give rise to the least loss of blood. This is because the conditions under which these wounds are produced are singularly favorable to spontaneous hemostasis. Some men, however, come to the dressing station with typical arterial hemorrhage in jets, which, if not promptly controlled, may result fatally. The wound may present surface venous oozing, both free and large in amount. Cases of these types are not at all exceptional and hemostasis in all its forms is one of the principal operations at first line dressing stations which should be well supplied with all the requisite instruments.

Infection is the third dangerous condition which must be dealt with at the first dressing. Personally, I believe that every wound of warfare should be regarded as infected from the start. This axiom is, perhaps, false in the case of certain rifle bullet wounds, but it always holds true in wounds from artillery projectiles. Surgeon Major Jullien says: "The preventive treatment of gangrene and infection in wounds in warfare must be based upon the principle that they are primarily infected and that the causal factors are located in the wound from the time of its receipt. Infection results from a combination of infecting bacteria and cell disorganization. The therapeutic action against infection should begin with the first dressing." Knowing the ends to be attained by the first dressing, how can they be fulfilled?

Pain is of secondary consideration in comparison with hemorrhage and infection. The three principal means at our disposal are the tourniquet, compression, and ligature. The tourniquet is now considered, with good reason, a bad hemostatic measure; not only is it painful, but it is above all singularly favorable to the development of infection and gan-

grene by provoking blood stasis in the portion of the limb distal to the point of stricture. Nevertheless, it must not be forgotten that it is the only sure means that the soldier or stretcher bearer can resort to while awaiting the arrival of the surgeon in the trench or on the field, and when employed in these circumstances upon the express condition that it is not left in place for more than one hour, the tourniquet will render great service in the saving of life. Unless destitute of all other necessities, the surgeon should resort to other hemostatic measures. A compression dressing will suffice in the majority of cases, particularly in capillary or venous oozing surfaces. If need be, a somewhat tight gauze packing of the wound is indicated, this being covered with absorbent cotton and a roller bandage. Ligature is the proceeding of choice in arterial hemorrhage and should be done in every case where possible, that is, in quiet sectors where patients are not numerous. If the usual ligature can not be made or if the surgeon is hurried, a hemostat may be placed on the bleeding artery and a dressing applied over it.

For the control of infection, the ideal antiseptic should destroy the bacteria and prevent their development without injuring the vitality of the tissues which are already disorganized by the traumatism. It is unquestionable that iodine and absolute alcohol are very injurious to the anatomical elements. On the other hand, the bactericidal action of tincture of iodine, although undoubtedly powerful, is nevertheless insufficient to sterilize a wound of any importance. I believe that the bactericidal power of the antiseptic is considerably decreased by its property of coagulating albuminoids with the result that when the superficial bacteria are destroyed, those more deeply seated are protected by the gangue due to the action of the medicament. These bacteria will develop later and the infection continues. To these drawbacks of iodine it may be added that disinfection by this agent of a fairly large and irregular wound requires a considerable quantity of the tincture if anything is to be accomplished and that the tincture of iodine is very expensive. Therefore in a long list of antiseptics it can be readily conceived that efforts have been made to discover one that will take the place of iodine. Dakin's fluid is an ideal antiseptic and has shown its superiority over others in the fact that it combines a marked bactericidal action with a minimum noxious effect on the living cells. It may be maintained that it is folly to attempt to apply Carrel's method at the first line dressing station, and we do not use the method of continuous irrigation with rubber tubes. The simplified method that we employ can be described in a few words as follows: The skin surrounding the wound is washed with a fourteen per cent. salt solution whose hemolyzing properties admirably remove all trace of blood and give the skin a white clean aspect. Next the wound itself is cleansed with an irrigation with Dakin's fluid. The wound is dressed with fluff antiseptic gauze impregnated with the fluid which in turn is covered with a thick layer of sterilized nonabsorbent cotton. Dakin's fluid may be replaced if necessary by a fourteen per cent. salt solution. Jullien has pointed

out that "concentrated salt solutions place the patient in a real brine bath which prevents the pullulation of bacteria, but which has, perhaps, the disadvantage, as an immediate dressing, of exercising a hemolyzing action which delays the formation of clot." The different steps of this technic are supposed to be done with sterilized material.

One may, but under the express understanding that this last condition is complied with, push the application of this method still further. Sterilized rubber tubes may be inserted in the wound so that all its surface and irregularities can be irrigated. Dakin's fluid is used in intermittent instillations, the fluid being injected every two hours. One or several instillations can be made at the dressing station, according to the time the patient remains before being sent to a hospital at the rear. At each change of division stretcher bearers an instillation may be given, as well as at the sorting station. It goes without saying that at present we are far from being able to apply this last improvement, but I do not think that it is an impossibility. From the practical standpoint salt solution and Dakin's fluid offer over the tincture of iodine the great advantage of being far less costly. They can be easily supplied in advanced dressing stations in stock solution which the regimental surgeons have in their provisions and may be diluted with fairly sterile water. From the surgical standpoint they present a twofold superiority: 1, their harmful action on the living tissue is almost nil, and 2, their bactericidal action, although less strenuous, is much surer. They do not coagulate albuminoids, and they hold the bacteria constantly under their influence.

I would here point out that two conditions are essential in order to deal effectively with infection. The first is that all parts, without exception, should be in contact with the antiseptic. This gives rise to the necessity of opening up freely all infected closed cavities. The second is that the action of the medicament should be continuous. This is obtained by continued or intermittent instillation. The success of the method is due in a large measure to the successful application of these principles. Antitetic injections should be given as a routine measure at every dressing station wherever possible, that is to say when a violent battle is not in progress when a great number of wounded are suddenly thrown upon the station. By observing this practice the number of deaths from tetanus has been markedly reduced. Out of a total of 10,000 cases treated at his hospital, Surgeon Major Piqué did not meet with a single case of primary tetanus and had only three cases of delayed tetanus, a splendid record due to prophylactic injections. In spite of the improvements made in the technic of the first dressing, this can never be more than an essentially temporary one. There is a prime defect: the patient bleeds and the dressing is soaked, the blood, cotton, and body heat constituting an ideal culture medium for the bacteria of septicemia and gangrene. Although at first protective, the first dressing rapidly becomes infecting and for this reason great care should be taken in its application and it should be changed as soon as possible.

When organizing a dressing station near the

trenches protection against projectiles should always be sought. There are technical considerations in connection with this point which should always be present in the mind of the surgeon. Reduced to small quarters, with the ground covered with straw which serves as a bed for the personnel, a dressing station becomes a deplorable place in which the doctor, no matter how complete his education, inevitably loses his surgical perspective, a loss which is further favored by the rush and turmoil of battle. It is, therefore, essential to establish what may be called a surgical installation at the first dressing station. By this, I do not mean that a dressing station can be transformed into a first line ambulance but simply that it should be made a decent working plant where clean work can be done and where the wounded can obtain proper shelter while waiting to be transferred to the ambulance. These remarks are made for my American confrères who have as yet not had practical experience.

VENEREAL DISEASE IN THE ARMY.*

By SIDNEY F. MORGAN,

Surgeon General's Office, Washington,
Lieutenant, Sanitary Corps, U. S. A.; Special Field Agent of the
American Red Cross.

Lieutenant Morgan, on behalf of Major William F. Snow, M. R. C., of the Surgeon General's Office, presented a summary of the program of the Surgeon General for the campaign against venereal disease from the viewpoint both of the attack and the defence. Lieutenant Morgan pointed out that while a vigorous medical defence against syphilis and gonococcus infections and chancroid were not new to the medical officers of the army, a direct attack on the strongholds of these diseases was a new phase of the work which was now being thoroughly organized. As the sources of infection were human carriers found in civil life, steps were being taken to enforce the law against vice districts, whether open or clandestine, and to discover and treat those found infected; also to prevent the sale of alcoholic drinks to soldiers because of their well known evil influence in causing the spread of these diseases. Not only was this frontal attack to be delivered against the strongholds of venereal disease, but the men of the new armies were being educated by means of pamphlets, literature, and pictures in the causes and effects of these infections. Adequate measures were being taken to provide recreation in camp and thus to minimize the tendency to sex temptations during the leisure hours of the men. The efforts of the Y. M. C. A. in this respect were highly commended.

Lieutenant Morgan said that in the discussion of modern warfare it had been stated that the contest finally resolved itself into a hand to hand fight; that man power would ultimately win the war, that is, the force would win whose units had superior strength. Science had been pressed into the service of overcoming man in battle, but it would be man alone who would make final victory possible. Thus any factor that tended to weaken the individual sol-

*Abstract of an address delivered December 21, 1917, at the annual meeting of the American Association for the Advancement of Science, Section K, Experimental Medicine, at Pittsburgh, Pa.

dier was of itself a foe to be overcome. Looked upon in this light syphilis was a vigorous, insidious, and powerful enemy which could prolong the war indefinitely. According to statistics, whole divisions in the Austrian army were incapacitated by this disease, while their comrades were left to bear the brunt of the battle. Among communicable diseases syphilis and gonococcus infections were of the first importance. In peace time these formed one quarter of all diseases and among troops they were the greatest factor in producing nonefficiency. The responsibility of the Government, then, to those two million men who were called upon to leave their homes and become part of the fighting machine, was very vital. Nothing should be left undone to protect those men from unhealthy influences, not only for their own sakes but for the sakes of the homes they left behind and to which they would return. The Government had also to consider the impression that the American character would make upon the other allied nations and also what new physical characteristics the troops would acquire and bring back with them to civil life.

In considering all these points the Surgeon General had developed the four methods of attack referred to, namely, social, educational, prophylactic, and medical. The social side included prevention of prostitution and effective recreational measures for the men; the educational attack comprised lectures illustrating the ravages of syphilis; while prophylaxis and medical care were urged upon those who risked infection. It could be said that spread of venereal diseases was propagated mainly by commercialized prostitution, which was only possible as long as the consent of the community permitted such a condition. The Commission on Training Camp Activities had recently taken this matter thoroughly in hand by closing notorious districts. Since the laws against disorderly houses had been enforced, vice had attempted to flourish by means of the automobile. The jitney driver had become the procurer and one had been heard to boast that he had the addresses of one thousand girls that he could get without difficulty. In cold weather these men carried coats and blankets to the woods to further their trade. These attacks had also to be met and combated. Driving of infected women from one district to another, however, did not stamp out the evil. The epidemiologist would be able to give aid at this point, and must apply control methods to discover and isolate infected persons until a cure was established. Medical inspection should be applied to every person suspected of sexual irregularity. It was known that a single prostitute might be the means of spreading infection to as many as thirty men in a single night and these persons in turn became carriers of the disease. For the treatment of such cases it was necessary to open an increasing number of clinics, at convenient hours where those who were unable to pay could be treated free of cost. At these centres the woman could also be brought under treatment. The United States Public Health Service had been invited to take control of cantonment areas and the methods of control to be used were the same as in meningitis or other infective disease. Infected persons who were detected were obliged to report until cured. This matter was not in the theoretical

stage as it was already operating in California and in Michigan. A special section of the campaign against venereal disease was to be attached to the Division of Infectious Diseases, under Colonel F. F. Russell and a special staff of commissioned and noncommissioned officers was being detailed to carry out this work. Naturally men with special qualifications were picked. Sergeants were directed to secure the confidence of the men and to advise them how to get prophylaxis and treatment when necessary. Special stations were provided which might be termed "advanced dressing stations," where men might receive prompt treatment. These were called United States Army infirmaries, as a sort of camouflage, but their use was made plain to the men. Severe penalties were imposed upon men who failed to take advantage of this assistance. The soldier discovered with symptoms of venereal disease was hospitalized, separated from his comrades, and remained under a stigma. A committee of five specialists in genitourinary diseases had been formed to deal with these questions, act as an advisory board, and standardize a mode of treatment. These measures, however, were not new in the regular army. The impression was that venereal diseases were very prevalent among the regular soldiers, but that this was not so was shown by the following figures: the proportion among drafted men was 387.6 per 1,000; National Guard, 145 per 1,000; Regular Army, 79 per 1000. This showed that strict measures were effective.

In conclusion Lieutenant Morgan said that the situation was being equally carefully studied in England and in France. This was the psychological moment to strike. If the horrors of war and all the lives that must pay for victory were to be compensated for at all, it would be by establishing an assurance that cleaner, fresher lives would result to the generations that must come after.

LESSONS TAUGHT BY THE WAR IN THE TREATMENT OF GUNSHOT INJURIES.*

By WALTON MARTIN, M. D., F. A. C. S.,
New York.

Doctor Martin said that his purpose was to review briefly some of the most obvious points. His hearers might be familiar with them, but he thought none the less that they were worth while repeating. The first of these was the lesson taught by the type of projectile. Before the present crisis, army surgeons had supposed that they had learned all that it was necessary to know about wounds from different types of projectiles, from the results of the South African and the Russo-Japanese wars. Wounds in those wars were caused by bullets from rifles at a range of about 500 metres. Those missiles were sharp, passed through the tissues with small wounds of entrance and exit, causing but a small zone of damage and carried with them very few foreign bodies. Doctor Martin said he had seen a French soldier wounded in three places by a missile fired from a machine gun at 600 metres. There were wounds in the frontal region, in the

*Abstract of an address delivered December 31, 1917, at the annual meeting of the American Association for the Advancement of Science, Section K, Preventive Medicine, at Pittsburgh, Pa.

lung, and through the leg. These wounds were simply clean punctures such as would be made by a trocar. In this case they were simply sterilized, the fractures immobilized, and the man made a complete recovery. In the Russo-Japanese War 86.5 per cent. of the injuries were caused by rifle bullets at considerable range, but in the present war such wounds were comparatively few. Men were dealing with an entirely different type.

Surgeons were totally unprepared for the types of injuries in the present war, caused by the artillery projectile, fragments of bursting shell, shrapnel bullets, or fragments of metal from bombs. Up to the present very few statistics were available, but for the month of August reports from the French lines showed that seventy-six per cent. of all wounds were caused by artillery projectiles. These were jagged pieces of metal, passing into the depths of the tissues and carrying with them unclean scraps of clothing which there became imbedded. Sometimes also the bullet would strike sideways, leaving extensive zones of contusion about the bullet track. During the first year of the war sufficient recognition was not taken of the fact that all the wounds were contaminated by such organisms as the streptococcus, the tetanus bacillus and the *Bacillus of Welch*. This infection was carried into culture mediums wherever there existed heat, moisture, and detritus of broken down tissues, suitable for bacterial propagation. Early in the war, however, the danger from tetanus was recognized and a regulation was adopted to treat every wounded soldier with a standard dose of antitoxin, with the result that this infection had been practically eliminated. No treatment, however, was sufficient to counteract the other types of infection. The old dictum, "The safety of the patient is in the hands of the man who puts on the first dressing" was not true today. The safety of the patient now lay in getting him to a well equipped hospital with the least possible delay. It was absolutely necessary to remove the detritus of the wound as early as possible. This might be done with a sharp knife or with scissors. The question also came up as to the considerations under which dressings might be applied in modern surgery.

To give an idea of the technical difficulties in handling the wounded at the front, one could suppose a case of a man wounded in an accident downtown in New York, taken to the nearest out patient clinic and there treated very hurriedly by a surgeon, next sent on to the New York Hospital to receive some change of dressings and packed off to St. Luke's Hospital for reexamination and finally shipped off to New Haven to be treated by major operation, under anesthesia. This gave a fair idea of the conditions prevailing in modern warfare. The wounded were necessarily moved from station to station; they were jolted, the foreign bodies got rubbed into the tissues, and much time necessarily elapsed before they came under the necessary surgical technic. Carrel had shown that if the surgeon could get the wounded into his hands within eight hours, infection could be eliminated and complete asepsis obtained. Under actual conditions, however, the usual procedure was as follows: The

wounded could perhaps be rescued shortly after they fell. They were then taken to the regimental station, a ruined house or the shelter of a rock, where it was dark and there was no means to carry out technic. From thence they went to the advanced dressing station, a broken down outbuilding, thence by ambulance to the casualty clearing hospital which was the first place where they could have technical treatment. All observers were now agreed that it was impossible to disinfect wounds on the field and everyone had abandoned the attempt to obtain surface disinfection. Infectious material could only be cut out when the man reached a proper operating room. All wounds should be laid wide open and the removal of all devitalized tissue was imperative. Even on this point there was great disagreement as to the necessary amount of necrotic tissue to be removed. In widely contused wounds or in multiple wounds it would be impossible to remove all tissue; there were anatomical limitations to the entire cleansing of such injuries. Here the Dakin-Carrel treatment, with its feature of mechanical cleansing of the wound was very helpful.

As the wounded passed through many hands the treatment by many different surgeons gave rise to conflicting statements as to prognosis, some very favorable, some pessimistic. Both points of view had truth. It depended entirely on how soon the surgeon was able to handle his patient after the injury. The most satisfactory reports were to be quoted from the statistics of Doctor DePage, well known in this country, whose work was carried on on that small portion of Belgian territory unoccupied by the German lines. His hospital being sufficiently near the front, he was not obliged to evacuate the wounded. He received cases of wounds of the abdomen from the advanced post in a time varying from twenty minutes to three hours, and gunshot wounds of the long bones were received at the main hospital in from two to six hours. Doctor DePage stated that in wounds of the knee joint the best results were obtained from mechanical removal of foreign material and closure of the synovia by suture. The recoveries with restoration of movement were eighty per cent. The year before, in wounds of the knee treated by the Carrel treatment, the recoveries with motion were forty per cent. and in fifteen per cent. amputations of the thigh were necessary. None were performed during the period in which the joint was closed after mechanical cleansing. In gunshot fractures, however, the best results were obtained by following the exact technic of Carrel. Seventy-five cases had been reported in which Doctor DePage had been able to make secondary closure of the wound in periods of from fifteen days to four weeks.

In summing up, Doctor Martin said that the main question was getting a wounded man to a well equipped hospital in the minimum of time. This of course depended upon the enemy's fire, as ambulances were systematically shelled and the wounded could only be moved at nightfall. At Verdun it was twenty-four hours before the wounded reached surgical care. The main points to be re-

membered were: In this war the type of injury was different to other wars; 80.5 per cent. of wounds were caused by artillery projectiles; all wounds were extensively infected and contained foreign bodies. A vital point was the perfection of means of transportation, as with a delay of twenty-four hours, bacteria in a wound might increase to many millions, therefore, there was a necessity for experienced surgeons as near the line as possible; and it was necessary to have x ray apparatus as near as might be to the advanced post.

EXAMINATIONS FOR TUBERCULOSIS AND CARDIOVASCULAR DISEASES IN SOME MILITARY UNITS.

At a meeting of the Philadelphia County Medical Society in Philadelphia on Wednesday, January 9, 1918, some interesting and significant reports were made by certain members of boards of examiners for tuberculosis and cardiovascular disease. The camps at which the examinations were conducted were the camp at Allentown; the first and second officers' training camps at Fort Niagara and Gettysburg; among men of the Sixth Infantry National Guard of Pennsylvania; and among men in camps and armories in Philadelphia, Washington, and Texas.

REPORT OF THE TUBERCULOSIS EXAMINING BOARD AT ALLENTOWN CAMP.

Lieutenant Rae S. Dorsett gave the personnel of the board as consisting of Dr. John J. Robrecht, Dr. William S. Wray, Dr. Robert G. Torrey, Dr. Louis Jurist, Dr. Albert E. Blackburn, and himself. Work was begun on July 25, 1917, and finished during the first week of September. Two hundred and twenty officers had been examined, of whom five were found to have active tuberculosis. Of the 5,293 men examined, eighteen had active tuberculosis. At the time of its work the board could simply make recommendations to the disability board at the camp. The disability board with the hope of improvement in the condition of the men had retained in service some recommended by the examining board as physically unfit. In four instances, however, improvement was not realized and the men were discharged. The examining board could not but feel that had its recommendations been promptly accepted some expense to the Government would have been saved.

EXAMINATION OF MEN AT FORT NIAGARA AND GETTYSBURG.

Lieutenant Augustus A. Eshner related his experience as a member of a tuberculosis and cardiovascular board in the examination of men at Fort Niagara and Gettysburg. In the first Reserve Officers' Training Camp at the former place 2,000 men were examined and in the second camp approximately 2,200, including, in addition to candidates, a certain number of national guardsmen, artillerymen, quartermasters' men, men on detached service and others. Only a few cases of active tuberculosis were found, and but a small number of cases of disqualifying cardiovascular disease. At Gettysburg more than 10,000 enlisted men were examined, including twenty-nine cases of active tuberculosis, and

sixty-two cases of disqualifying cardiovascular disease. Doctor Eshner called special attention to the large number of cases in which a murmur was audible in the third left intercostal space near the sternum, often transmitted obliquely upward to the left, and which he was disposed to attribute to physical changes of an undetermined character induced in structures at the base of the heart in consequence of the great physical activity to which the men were subjected in the course of their training. He also expressed the view that a third sound or even a well developed presystolic murmur could be generated as a result of temporary or permanent derangement in the relations between the left auricle and ventricle and the mitral orifice, whether in consequence of actual antecedent disease or from abnormal functional demands.

REPORT OF THE EXAMINATION OF THE SIXTH INFANTRY NATIONAL GUARD OF PENNSYLVANIA.

Dr. Herman B. Allyn reported that the examination was part of a general examination of all the National Guard stationed in Philadelphia. It was in charge of a tuberculosis board, of which Captain, now Major, Siner was president. The writer and Dr. John A. O'Connell were assigned to the examination of that portion of the Sixth Infantry stationed in Philadelphia. Every one in authority had been ready to help in the work and had received the board most cordially. Instructions to the board were explicit; they were to recommend the rejection of cases of active tuberculosis, as determined by the presence of râles, but were to retain in the service the men having old or quiescent lesions. The feeling was expressed that perhaps a wider latitude allowed the examiner would have resulted in weeding out some who were not likely to render good service in the army. Osler's experience with the British Army, it was observed, had been that those with long narrow chests, the mouth breathers, and the neurasthenics filled the hospitals. Fortunately, in Doctor Allyn's opinion, the examining board had its own disability board so that all those recommended for discharge by the board were, so far as known, dismissed from the service. Doctor O'Connell and Doctor Allyn examined 766 men, among whom they found eleven cases of tuberculosis and twenty-five cases of heart disease. Some of these were recommended for discharge and others were referred to the regimental surgeon. The belief was expressed that it would be better in any subsequent examination to keep a record in duplicate on filing cards of every man in whom anything abnormal was found.

REPORT OF EXAMINATIONS MADE IN CAMPS AND ARMORIES IN PHILADELPHIA, GETTYSBURG, WASHINGTON, AND TEXAS.

Captain A. C. Morgan reported that their Board of Examiners for Tuberculosis and Cardiovascular Disease had examined 6,308 men in Philadelphia and the vicinity during August and September, 1917. There were found in this number thirty-two cases of tuberculosis, only nine of which were discharged from the army. The remainder showing small arrested lesions, with otherwise good physical condition, were recommended for retention in the service. There were discharged from the service fourteen cases of valvular heart disease, two cases

of adherent pericardium, and one case of chronic nephritis with marked arterial hypertension. A statistical report of other conditions found by the writer in association with Dr. T. Mellor Tyson in further study of the First Pennsylvania Regiment Infantry was embodied in the paper. Their work at Gettysburg was in the nature of a study of recalled cases and review of recruits sent down from Harrisburg and other recruiting stations. On one occasion over fifty per cent. of the recruits were rejected. Captain Morgan believed that if highly trained medical men passed upon applicants at recruiting stations, the need for specialists in the army would be very greatly decreased. In the technic insisted upon by Colonel G. E. Bushnell, when persistent moist rales are present, negative sputum examinations and x ray findings are not to be given preference, this sign being deemed of sufficient importance to establish diagnosis of active pulmonary tuberculosis and to justify dismissal from service. At Waco nearly 12,000 men from Wisconsin and Michigan were examined. A remarkable finding was that of a very great number of cases of hyperthyroidism, many of large size. Many showed cardiac murmurs. A few had tremors and tachycardia, while but a very small number presented scars from operative treatment. Five hundred and ninety cases were referred to the cardiovascular board. While no classified table was made there was apparently an unusually large proportion of cases of aortic regurgitation. The majority of the cases presented history of acute articular rheumatism. Twenty-seven cases were referred to the psychopathic department; twenty-five to the orthopedic, and forty-five to the nose and throat departments. Five cases of asthma were discovered. Asthma should undoubtedly exclude the subject from service. In relation to administrative problems, let me say that in army circles when one is expecting orders or information he should be content with the apparent slowness of various procedures and, to use the army phrase, "sit tight" until orders come through.

MEDICAL NEWS FROM WASHINGTON.

Four Hundred Thousand Dollars to Be Spent for Improvement of Neighborhood of Southern Camps.—Dental, Sanitary, and Veterinary Corps Members to Be Trained at Fort Oglethorpe.—Increase in the Personnel of Naval Hospital Corps.

WASHINGTON, D. C., February 13, 1918.

Special attention now is being given by the Surgeon General's Office to additional precautions and facilities to be undertaken for the protection of the health of troops, particularly those stationed at Southern camps. Considerable apprehension is expressed by the medical authorities that it will be difficult to prevent contagious diseases, due to the severe climatic conditions to which soldiers will be subjected, especially those not accustomed to the summer weather of the South. In anticipation of serious trouble of this character, the Public Health Service, in cooperation with the army Medical Department, has planned for the expenditure of about \$400,000 for the improvement of the neighborhoods of camps. It is not proposed at present to build new cantonments, and it may be out of the question to

obtain sufficient tentage to establish new temporary camps and thereby relieve the overcrowded conditions prevailing. Altogether the situation is a serious one, which is fraught with many perplexities.

* * * * *

The training establishment of the Medical Department at Fort Oglethorpe, Ga., where members of the Medical Reserve Corps have been given instruction preparatory to being assigned to duty, is to be enlarged in order to afford facilities for military and professional training for other classes of the personnel of the Medical Department, including members of the Dental Corps, Sanitary Corps, and Veterinary Corps. Considerable work in the way of additional temporary buildings and installation of other facilities will have to be done before the courses begin, and their commencement depends largely upon the time of completion of the work. The course for the dental personnel will cover a period of two months, one month being devoted to military instruction and one to professional. The professional instruction will be in charge of a member of the Dental Corps of the regular army, who will be assisted by several members of that corps and of the Dental Reserve Corps, and these officers soon will be selected. Each class of dentists will include 165 student officers, and a class of similar size will be conducted for enlisted men for service as dentists' assistants. All those recently appointed to the regular Dental Corps will be assigned to the first class, together with a sufficient number of the reserve corps to make up the allotted number. Those subsequently appointed to the regular corps and members of the reserve corps will be assigned to later classes from time to time.

The Surgeon General's Office has received from division surgeons and others many recommendations regarding eligibility for promotion of members of the Dental Reserve Corps, these reports being submitted in accordance with instructions recently sent out preparatory to advancing some of the reservists, all of whom now have the rank of first lieutenant, to the grades of major and captain. Recommendations from some of the divisions have not been received up to this time, and until all are in the lists of those proposed for promotion will not be made up.

* * * * *

With the proposed increase in the enlisted personnel of the navy, the naval hospital corps, the strength of which is a fixed percentage of the naval strength, will have an authorized strength of approximately 10,000 men, exclusive of the female nurse corps. Every man in the naval hospital corps has volunteered for that duty, and he is examined carefully for a determination of fitness before he is accepted. His training begins at the time he arrives at a training station, and it continues while he passes through the hospital corps school at a naval hospital, and later on board ship. The long established policy of the Medical Department of the navy in taking care of the navy sick and injured has been amplified during this war by every available means, especially by utilizing civilian physicians, hospitals, and nurses.

Editorial Notes and Comments

NEW YORK MEDICAL JOURNAL

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and the Medical News

A Weekly Review of Medicine

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NEW YORK, SATURDAY, FEBRUARY 16, 1918.

A SOUND ATTACK UPON THE PNEUMONIA PROBLEM IN CAMP.

Vigor of utterance and a specific application of scientific knowledge and principles backed by sound common sense mark the editorial comment on the pneumonia problem which appears in the January issue of the *Journal of Laboratory and Clinical Medicine*. The article deals forcibly and practically with the grave question of the prevalence of pneumonia and measles in our camps; this disease is so closely associated with pneumonia that they cannot, under existing circumstances, be dealt with separately.

Pneumonia is one of the most important and dangerous complications and sequelæ of measles. It is not enough that the cases of measles shall be properly isolated and that the men shall be successfully cured of the disease. This is of sufficient importance to demand much more circumspection and much better equipment than have yet been altogether the rule. Of still great importance is extension of the period of convalescence to provide for the period when the soldier offers a lowered resistance to infection from pneumococci and streptococci.

Moreover, experience has shown that these patients are themselves carriers of pneumococci and streptococci in a virulent form. They therefore need some protection from one another, which can be to a certain extent procured through more ample air space about their cots and perhaps an antiseptic screen set up between them. Strict disinfection of each individual's belongings and utensils should also be observed, with avoidance of dissemination of dust in the ward.

Overcrowding, lack of air space, and carelessness in regard to dust are to a large extent responsible for the prevalence of respiratory disease in the camps. Delay in providing hospital facilities, lack of nurses, and worst of all the sending of troops from an infected camp to one free from infection are some of the more obvious causes for these diseases, which it is hoped will soon be more efficiently done away with. Emphasis is very well laid upon the need of warm clothing and extra bedding. We are likely to stress the benefit accruing from the life of hardening and discipline which the camps provide, but are in danger in so doing of being misled on the wrong side of sentiment. Common sense, profiting also by the experience of our Allies, recognizes the danger of plunging men from entirely different housing conditions into vigorous exposure to cold, extreme bathing practice, and out of door living and sleeping, without providing at the same time the protection of warmer clothing, warmer covering, and warmer quarters until a healthy transition has been made. Respiratory diseases are largely the results of such want of forethought or of scanty provision, especially when the soldier has been accustomed to warmer climatic conditions.

In regard to the universality of harborage of pneumonia germs, the article quotes the findings of Cole and his associates from investigations which are being continued in the camps. Streptococci as well as pneumococci are present in bronchopneumonia and may or may not be the sole causative agent. In lobar pneumonia the microorganisms have received more fruitful study and have been differentiated into types and subtypes. Contrary to recent belief in the presence of the causative agent in the saliva of healthy persons, only awaiting conditions of exposure or lowered resistance to develop pathologically, it was found that more than fifty per cent. of 297 healthy individuals, who had not been in contact with lobar pneumonia, were free from any form of pneumococcus. In comparison with the findings in 458 cases of lobar pneumonia only a very small percentage of the types causing the disease was found in the healthy persons, while

the types most prevalent with them gave rise to a minority of cases of lobar pneumonia, and the disease produced by them was usually of a milder type. On the contrary the two types which are most responsible for lobar pneumonia and are of high virulence are seldom or never present in healthy individuals unless they have associated with patients suffering from the disease.

These are all scientific facts toward whose extension investigation is tending. They are matters of definite control and regulation for fitness or not for the task in hand. No less important are the practical details of clothing, housing, hospital accommodation, isolation, and medical care. "Possession of knowledge," the writer says, "is of no value unless it be accompanied by the means necessary for its application." His presentation of facts is offered in no spirit of criticism, only in so far as he believes it the duty of the medical profession to protest vigorously and repeatedly and to reiterate the wisest measures and precautions.

THE ECONOMIC CONSEQUENCES OF PHYSICAL DISABILITY.

The Red Cross Institute for Crippled and Disabled Men, which has recently been established in New York through the generosity of Mr. Jeremiah Milbank, is engaged in making a study of civilian cripples with a view to applying the results of this study to the disabled soldiers whom we shall shortly begin to receive from European battlefields. The institute has just published the results of the study made by Dr. John Culbert Faries of the economic consequences of physical disability among a number of civilian cripples in New York which show the need for coordinated effort in the treatment of such cases if we wish to keep down to the minimum number the paupers created by the war.

There is a sense of obligation on the part of many employers to take back on their payroll men who have been injured while in their employ, but in the course of investigation made in Cincinnati it was asserted by some that such men ceased to be valuable, presuming upon the moral obligation felt by the employer. On the other hand, however, those who employed maimed or crippled workmen, for whose handicap they were not responsible, found that such men gave a more efficient and loyal service, apparently from a sense of gratitude.

Out of a total of 226 injuries to the upper limbs, 173 patients found employment and fifty-three were without employment; in 158 of these cases, the fingers were the parts affected, and 133 of these patients found employment, leaving only twenty-five idle. In thirty-six cases where the hands were amputated or rendered useless, twenty-three found

employment, and out of thirty-two cases in which the arms were rendered useless or amputated, seventeen found employment. Out of 127 patients, whose lower limbs had been injured, fifty-three found employment, showing a marked contrast to the effects of injuries of the upper limbs. In eleven of these cases, all the toes were amputated; nine of these patients found employment. In twenty-four cases in which the feet were injured, only nine found reemployment. Out of ninety-two cases involving injuries of the legs only thirty-five patients found reemployment. Sixty-five of the latter cases included amputations, and in thirty-eight of the amputations artificial limbs had been obtained. The possession of an artificial limb seems to be an important factor in obtaining employment, a fact which points the way toward a worthy charity. When a man is crippled the skill which he has been years in acquiring is ordinarily destroyed, and in the effort to reeducate the cripple it seems most desirable to make use of such knowledge as he has acquired in a particular line, even if the injury prevents his making use of his dexterity.

This preliminary study by Doctor Faries is most interesting and shows that the field affords an opportunity for a further and more widespread study. Entirely apart from any results of the war the economic consequences of physical disability are grave both for the individual and for the state, and such work as is being carried on by the Red Cross Institute for Crippled and Disabled Men will go far toward pointing out the best methods to pursue when building up cripples into selfsupporting members of society.

VAGOTONIC TYMPANITES.

Continued minute study of the vegetative nervous system is serving to bring into prominence the all pervading importance of this rôle of the nervous system in everyday pathology. Ballint (*Berliner klinische Wochenschrift*, 1917, xviii) has contributed a study on the action of the vagus in producing tympanitic states. The special peculiarity noted was a marked distention of the abdomen, which disappeared suddenly and spontaneously after the administration of atropine, and reappeared again upon the administration of physostigmine. The condition, with its accompanying symptoms, is not infrequent but is either often overlooked or gives rise to serious diagnostic and therapeutic errors. In a case of myocarditis, there was distinct arrhythmia and ascites, inability to retain liquids, a resonant tympanites, hepatic dullness, arrhythmic sluggish respiration, and bradycardia. One hour after subcutaneous injection of atropine the abdomen had returned to normal and the various symptoms had

disappeared. Three days later the same thing occurred again.

In another case diagnosed as tuberculous peritonitis, which did not appear to Ballint as peritonitis, there were the same abdominal phenomena without, however, other abdominal symptoms except some pain, but accompanied by respiratory arrhythmia and bradycardia. In both this and the following case, similar in manifestation, the symptoms disappeared after atropine and reappeared with the administration of physostigmine.

In all the cases the gastric and intestinal functions were undisturbed except that there was hyperacidity. There was a marked urinary disturbance observable in two of the patients. This consisted of a diminution of fluid in the detumescence of the abdomen as well as of sodium chloride and nitrogen and an increase of these during expansion of the abdomen, the patient suddenly eliminating the retained products. Vagotonic pupillary reaction, Graefe's sign, and eosinophilia were other manifestations of vagotonic action.

Various other explanations of the tympanites have been offered but none of them accords strictly with the facts. The condition has been observed after dysentery or diarrhea resembling dysentery and after typhoid. The most important fact for this study is the occurrence of the tympanites upon the stimulation of the vagus nerve. This is more noteworthy because of the vagotonic symptoms which accompany the tympanites and its recurrence upon the administration of the vagus excitant, physostigmine, as well as the detumescence of the abdominal swelling together with the disappearance of the other symptoms when atropine, a vagus depressant, is administered. The urinary disturbance is also explained in the same manner, for this, too, is controlled by the action of these antagonistic drugs. This testifies to the influence of the vagus upon the urinary function through the action of the vagus upon the kidneys, a matter which has been for some time under investigation.

This study throws light upon the action of the vagus nerve, which will correct and modify therapeutic treatment for this fairly common abdominal condition noted here. It has also, doubtless, significance for future researches in the territory of psychic influences upon abdominal conditions and these visceral functions involved. While this condition, as manifested in the cases studied, may have no hysterical etiology, this does not exclude from consideration various hysterical and other psychoneurotic conditions, in which such symptoms play a prominent part, for the vagus forms an important pathway between psychic impulses and their somatic manifestations.

AMUSEMENTS AND NATIONAL HEALTH.

Occasionally a remark is heard concerning the extravagance of theatre going in these times of pressure and need of economy. For the greater part, however, there is silent but impressive testimony in the multitude of theatre goers to the special place which theatres, opera houses, concert halls, moving picture houses, and lecture halls hold in the maintenance of the mental and moral wellbeing and health of the people. The more obvious obtaining of recreation and amusement conceals from the multitudes the deeper underlying therapeutic effect of these things, but it is none the less the reality of this that makes them more eagerly sought at this time of "storm and stress," in spite of economic pressure, than perhaps ever before.

We are coming to realize in a more comprehending way something of that which the ancient world intuitively knew, that the drama touches the most real things of life in a way to release impulses and desires which otherwise must be fettered in the serious business of living. It releases them in a form in which they are granted a special satisfaction without following those direct individual pathways which cultural society and external cares, as well as individual inner striving after demanded cultural standards, could not permit ordinary access. The recreation and the stimulus of the evening hour is a profound one, resulting from contact with the deeper issue of individual strivings, in the collective experience of all humanity and in the immeasurable emotional depths where wishes have that peculiar source and impetus which make them difficult of modification to external life. These amusement opportunities are peculiarly needed and are instinctively sought after with special eagerness at the present time. This is imperatively as it should be if we are to preserve the mental and moral health needed for the nation's tasks. It is emphatically necessary that ample opportunity shall be available for our soldiers and sailors under the strain of intensive preparation, the uncertainty that shrouds their immediate future movements and the seriousness of the realities which they all silently face. Added to these are the separation from home and friends and the strenuous life of strange scenes into which they are plunged, with the further factor of the extra suppression they must exercise in the strict censorship put upon their communications to friends and acquaintances both here and at home.

The theatres and other places of amusement and recreation are needed as never before, and yet, as with other necessities rendered indispensable by the war, the situation invites the selfish greed of the speculator and his exploitation of this manifest need of the people. Prices are being doubled and quad-

rupted by speculators who are allowed to control or purchase the entire capacity of the house, and many times, it is reported, the advance profit is divided between the speculators and the box office. People are thus being robbed by the exorbitant prices, and not a luxury but a necessity in the conservation of national health and especially in the morale and efficiency of the men in preparation for service abroad, is being prohibited those who most need it.

Should not Government interest and control be brought to bear upon this national necessity as it has upon other indispensable articles? Price of bread, meat, sugar, the supply of coal, and transportation have been taken up as matters for Government regulation or even management. Is there not reason that the important matter of amusements shall also be brought to the attention of the Government and claim its aid?

THE SIMULATION OF DISEASE.

The simulation of disease is so wide a topic that its discussion would require a volume of no considerable proportions. Dr. A. G. Dumez, of the United States Public Health Service, has contributed a very interesting study on one phase of this subject in a recent number of the *Public Health Reports*, namely, the use of drugs, chemicals, and septic materials for this purpose. To one who has not specially studied the subject, the list of these substances will prove astonishingly long and the results most ingenious. Indeed, without some such guide as is afforded by this collection of data on the subject, it would be difficult for a medical officer to make sure that he had not been victimized by a malingerer. Such simple substances as salt and milk consumed in large quantities for several days enter into the *materia medica* of the malingerer, producing a temporary albuminuria. The use of nitroglycerin or similar products for producing a rapid heart beat is widely known and frequently resorted to, but the application of crushed garlic to the axilla or the insertion of a peeled tooth of garlic into the rectum, which must be allowed to remain for twenty-four hours, as a means of causing a fever, will, we feel sure, strike most American practitioners as a novelty. All medical officers who are called upon to examine troops would find this little pamphlet of great value for present practical purposes and as a guide to further and more elaborate studies of the uses of certain of the substances named.

News Items.

Mayor's Committee on National Defense.—The Committee on Hospitals of the General Medical Board of the Council of National Defense has been reorganized with the following membership: Dr. S. S. Goldwater, New York, chairman; Dr. Winford Smith, Baltimore, Md., Dr. Joseph Marshall Flint, New Haven, Conn., Dr. Edward Martin, Philadelphia, Pa., Dr. Shepherd I. Franz, Washington, D. C., Dr. F. F. Simpson, Washington, D. C., Col. Robert E. Noble, Washington, D. C., Dr. Frederick A. Washburn, Boston, Mass.

\$25,000 for Eye Hospital in Palestine.—A gift of \$25,000 for the establishment of a model eye hospital in Palestine has been made by Mrs. Peter J. Schweitzer, of Brooklyn. The gift was announced by Dr. Joseph Krimsky, of Brooklyn, under whose supervision the hospital, which will be modeled on American lines, will be founded.

Columbia Begins Work on Buildings for Women Medical Students.—Announcement is made that a gift of \$50,000 from an association of women physicians and a total of \$18,000 from other donors have made it possible for Columbia University to begin work on the buildings for the accommodation of women students at the College of Physicians and Surgeons.

Commencement Exercises in Tufts Medical School.—After continuous session since September, 1916, during which time the third and fourth year courses have been completed, the 1918 class of Tufts Medical School, Boston, held its commencement exercises Wednesday evening, February 6th, fifty-five young men and women receiving the degree of M. D. Addresses were delivered by Dr. Hermon C. Bumpus, president of Tufts University, and Dr. Timothy Leary, of Boston.

Medical Association of the Greater City of New York.—The following program will be presented at a stated meeting of the association to be held in Du Bois Hall, New York Academy of Medicine, Monday evening, February 18th: Some Aspects of Symptomatic Treatment, by Dr. Edward E. Cornwall, president of the society; Acute Infectious Jaundice, by Dr. Charles Herrman, which will be discussed by Dr. Hideyo Noguchi, of the Rockefeller Institute; New Observations on Congenital Syphilis, by Dr. Percy Willard Roberts, which will be discussed by Dr. Virgil P. Gibney, Dr. Henry Ling Taylor, Dr. George Barrie, and Dr. Cyrus W. Field.

Public Health Service Boards Convened.—A board of commissioned medical officers of the United States Public Health Service will meet at the Marine Hospital, San Francisco, on Monday, February 18th, for the purpose of examining Assistant Surgeon J. H. Linson to determine his fitness for promotion. Senior Surgeon L. L. Williams is chairman of the board and Passed Assistant Surgeon D. S. Baughman is recorder. Another board, with Surgeon J. O. Cobb as chairman and Assistant Surgeon Walter C. Allen recorder, will meet in the Marine Hospital, Chicago, on February 18th, for the purpose of examining Assistant Surgeons C. V. Akina and J. G. Wilson, to determine their fitness for promotion.

Pneumonia in Army Training Camps.—According to reports received in the Office of the Surgeon General, Washington, D. C., during the week ending February 1, 1918 the total number of cases of pneumonia for the week in all training camps in the United States was 795, of which 64 were at Camp Pike, Little Rock, Ark., the highest number for any one camp. In Camp Travis, San Antonio, Tex., 54 cases were reported, and in Camp Cody, 50 cases. In other camps cases were reported as follows: Wadsworth, 15; Hancock, 15; McClellan, 5; Sevier, 19; Wheeler, 36; Logan, 11; Doniphan, 22; Bowie, 30; Sheridan, 15; Shelby, 12; Beauregard, 23; Kearney, 13; Devens, 7; Upton, 6; Dix, 3; Meade, 17; Lee, 21; Jackson, 17; Gordon, 18; Sherman, 4; Taylor, 30; Custer, 10; Grant, 12; Dodge, 20; Funston, 11; Lewis, 8. During the week the annual rate in all camps was, among regulars, 32.8 per 1,000; the National Guard, 42.6, and the National Army, 36.1 per 1,000.

Improvements at Sea View Hospital.—At a special meeting of the Medical Board of Sea View Hospital, Staten Island, the following resolutions were adopted:

WHEREAS, The Medical Board finds in Commissioner Bird S. Coler an official whose chief aim is the welfare of the patients, and

WHEREAS, Mr. Coler has expressed himself as relying entirely upon the Medical Board in the management of the medical affairs of the hospital, and

WHEREAS, Mr. Coler has very properly realized that the present condition of this hospital renders immediate changes necessary as emergency acts, and

WHEREAS, The Commissioner has already inaugurated certain measures of reorganization showing beneficent results, be it

Resolved, That the Medical Board, impressed by such cordial and intelligent appreciation of its hitherto unsatisfied demands, express its hearty approval of the Commissioner's attitude, and hereby pledge its energetic co-operation towards the making of Sea View Hospital the model institution which the city has by its generous expenditure intended it to be.

SIMON BARUCH, M. D., Chairman of the Committee.
FREDERICK COONEY, M. D., President of Board.
GEORGE MORD, M. D., Secretary of Board.

United Hospital Fund.—The bankers' and brokers' auxiliary of the fund announces that subscriptions totaling \$31,331 have been received in the campaign conducted for helping forty-six New York city hospitals to meet the expense of furnishing free treatment for the needy.

Proposed Amendment to Constitution and Bylaws of the Academy of Medicine.—At a stated meeting of the New York Academy of Medicine, held Thursday evening, February 7th, Dr. William M. Leszynsky moved that the clause in the constitution and bylaws of the academy requiring that all members be residents of the United States be amended to read "*citizens of the United States of America*." The motion was seconded and a recommendation made by Doctor Jacoby that it be referred to the council of the academy for approval.

Sioux Valley Eye and Ear Academy.—At the annual meeting of this organization of physicians from Iowa, Nebraska, and South Dakota, the following officers were elected: President, Dr. R. D. Alway, of Aberdeen, South Dakota; vice-president, Dr. H. B. Lemere, of Omaha, Neb.; secretary-treasurer, Dr. L. N. Grosvenor, of Huron, South Dakota. With a view to maintaining the highest standards of professional efficiency and ethical conduct among its members, a fellowship pledge to live in strict accordance with all the principles, declarations, and regulations of the academy has been adopted as a condition of fellowship.

Meetings of Medical Societies to Be Held in Philadelphia during the Coming Week.—Monday, February 18th, Academy of Medicine and Allied Sciences, Blockley Medical Society, Genitourinary Society, Medical Society of the Woman's Hospital; Tuesday, February 19th, Mount Sinai Hospital Clinical Society, West Branch of the County Medical Society; Wednesday, Section in Otolaryngology and the College of Physicians; Thursday, Northeast and Southeast Branches of the County Medical Society, Section in Ophthalmology of the College of Physicians; Friday, February 22d, Medical Club (directors) Neurological Society, Northern Medical Association, South Branch, County Medical Society.

Prevalence of Venereal Diseases in Army Training Camps.—Reports received in the Office of the Surgeon General for the week ending February 1, 1918, concerning disease conditions among troops in the United States, show that the annual admission rate for venereal diseases in National Guard camps was 60.7, among the regulars 75.5, and in the National Army camps, 116.4 in a thousand. The highest rate was at the National Army camp in Louisville, Ky., where it was 652 per thousand. The highest rate at any National Guard camp was in Houston, Tex., where the rate was 190.8 per thousand. In the following camps and departments admission rate was above the average: National Guard, Camp Logan, Camp Doniphan, Camp Wheeler, and Camp Bowie; National Army, Camp Zachary Taylor, Camp Pike, Camp Gordon, Camp Jackson; Regular Army, Southern Department.

Meetings of Medical Societies to Be Held in New York During the Coming Week.—Monday, February 18th, New York Academy of Medicine (Section in Ophthalmology), Medical Association of the Greater City of New York, Psychiatric Society of Ward's Island; Tuesday, February 19th, New York Academy of Medicine (Section in Medicine), Tri-Professional Medical Society of New York, Medical Society of the County of Kings, Federation of Medical Economic Leagues of New York; Wednesday, February 20th, New York Academy of Medicine (Section in Genitourinary Diseases), Alumni Association of City Hospital, New York, Women's Medical Association of New York City, Medicolegal Society of New York, Northwestern Medical and Surgical Society of New York, Bronx County Medical Society; Thursday, February 21st, New York Academy of Medicine (stated meeting), German Medical Society of Brooklyn New York Celtic Medical Society; Friday, February 22d, Society of New York German Physicians, New York Clinical Society, Manhattan Medical Society, Brooklyn Society of Internal Medicine, Italian Medical Society of New York; Saturday, February 23d, New York Medical and Surgical Society, West End Medical Society, Lenox Medical and Surgical Society.

Health of Army and Navy.—Health conditions in the Navy during the week ending February 9th are reported better than for many weeks, the improvement being especially noticeable in the material reduction in the number of cases of pneumonia and measles. At the office of the Surgeon General it was stated that the percentage of sickness from all causes is the smallest since the advent of winter. Quarantine is still being maintained at the Hampton Roads and St. Helena stations against Norfolk. It is understood at the department that Red Cross nurses have been sent to Norfolk in an effort to better the conditions there. The Medical Corps of the Navy is taking up consideration of the health conditions surrounding the Gulfport station and is cooperating with the local, State and federal authorities to avoid malarial conditions during the coming spring and summer months.

The death rate in the Army of the United States, as made up from the composite rate of the Regular Army, the National Guard and the National Army, continues to decline, being for the past week less than at any other time since the third week of November, 1917. Measles has been less prevalent than for weeks past, while pneumonia remains at about the same number of cases. The number of patients down with meningitis is becoming smaller and is about normal for the season. The noneffectives for duty in hospital remain at about the same number as last week, but this is due to the practice of holding patients a longer time in the hospital to insure their fitness to take up their usual work before discharge.

Personal.—Dr. I. H. Goldberger, of New York, has been appointed special lecturer on child hygiene at the School for Oral Hygiene, Columbia University.

Dr. William C. Braisted has been reappointed Surgeon General of the U. S. Navy.

Dr. Frederick W. Ireland, of South Norwalk, Conn., chief surgeon of the *Tuscania*, has cabled his parents that he is safe in Glasgow, Scotland.

Dr. William S. Thayer, professor of clinical medicine at Johns Hopkins University, has returned to America after spending four months in Russia as a member of the American Red Cross Commission.

Dr. Alden J. Woodruff has been appointed health officer of Babylon, Long Island, to fill the vacancy caused by the resignation of Dr. D. W. Wynkoop, who recently received a commission in the Medical Department of the Army.

Assistant Surgeons Walter Matthew Jones, William Howard Slaughter, and James G. Townsend, United States Public Health Service, have been nominated to the Senate for promotion to be passed assistant surgeons.

First Lieutenant Clyde F. Baccus and First Lieutenant John Smith, Jr., Medical Reserve Corps, U. S. Army, will proceed to Boston, Mass., and report in person to the director of the course in fractures and war surgery at the Boston City Hospital, and upon completion of this course will return to their proper station at Camp Upton.

Dr. John Dougherty, former superintendent of Greenpoint Hospital, Brooklyn, has received a commission as captain in the Medical Reserve Corps, U. S. Army. Another Brooklyn man to get a commission in the Medical Reserve Corps is Dr. John DeCesare Verrilli, of the German Hospital. He was appointed a first lieutenant.

Assistant Surgeon General W. C. Rucker, of the United States Public Health Service, has been detailed for special temporary duty with the War Department in Europe, both in the British Isles and on the Continent, in connection with maritime quarantine for the prevention of the introduction of quarantinable diseases into the United States.

Surgeon J. W. Schereschewsky, United States Public Health Service has been relieved from duty in Pittsburgh, Pa., in connection with field investigations of occupational diseases, and ordered to report to the Bureau of Medicine and Surgery, Washington, D. C., for duty as assistant surgeon general, in charge of the Division of Scientific Research.

Surgeon B. S. Warren, United States Public Health Service, has been relieved from duty with the United States Employees' Compensation Commission, and ordered to report to the Bureau of Medicine and Surgery, for duty as assistant surgeon general in charge of the Division of Sanitary Reports and Statistics.

Modern Treatment and Preventive Medicine

A Compendium of Therapeutics and Prophylaxis, Original and Adapted

TREATMENT OF SLEEPLESSNESS.

By LOUIS T. DE M. SAJOUS, B. S., M. D.,
Philadelphia.

(Continued from page 277.)

In considering the circulatory type of sleeplessness, in which the oncoming of sleep is interfered with by undue persistence of the free blood supply to the nerve centres characteristic of the waking state, mention has already been made of postural and hydrotherapeutic methods of treatment, as well as of the relationship of proper bed clothing and ventilation to sleep induction.

Another feature frequently of importance in insomnia is the persistent hyperemia brought on by mental work in the evening. In the average person intellectual activity at this period interferes little with the subsequent oncoming of sleep, for the additional expenditure of nervous energy gives rise to a corresponding degree of fatigue in the brain, thus creating a demand for rest and replenishment. In subjects with impaired elasticity of the cerebral vessels, however, or after inordinately severe and prolonged mental activity, the relative hyperemia attending such activity tends to persist for some hours after interruption of work, and the onset of sleep is correspondingly delayed. A directly nervous, excitative influence antagonizing sleep induction after arduous mental activity is not to be denied recognition, and as a matter of fact, it is upon the addition of worry to hard, continuous mental work that the prejudicial effect of the latter on the sleep function is most pronounced. The vascular influence nevertheless remains, and its existence necessitates, in many cases of sleeplessness, a more or less complete abstention from mental labor for some hours before bedtime. Occasionally the habit of reserving business or other problems for solution while in bed is responsible, at least in part, for sleeplessness, the cessation of sensory stimuli from the external world permitting better concentration and more complete analysis of various factors under consideration. Discovery of this habit by special inquiry and its subsequent correction at times exert an important influence in the successful management of insomnia.

The last measure requiring mention in relation to sleeplessness of circulatory origin is physical exercise. In this instance, however, the benefit obtained probably results not alone from an effect on the vascular system, but also from the sleep favoring influence of nervous fatigue. As in the case of ingestion of food before bedtime and general hydrotherapy, the circulatory action of physical exercise in assisting sleep induction is as a derivative measure. It may be considered operative chiefly in two ways. 1. Through fatigue of the vasomotor system and heart, the demand for accelerated circulation which attends general muscular activity placing a more or less pronounced stress upon the vasomotor and cardiac functions, with conse-

quent fatigue and a tendency toward sagging of the blood into the splanchnic and more dependent portions of the body, thus depleting the brain centres.

2. The consumption of pabulum by the muscles and possibly also the accumulation of waste products in their tissues may be expected to engender a need for extra circulation in them even after cessation of motor activity, this in turn tending again, in view of the considerable bulk of the voluntary muscle tissues, toward depletion of other structures, including the brain. The muscle glycogen, generally considered the substance from which the energy required for muscular contraction is derived, has been shown to disappear from muscle tissue more or less in proportion to the extent and duration of motor activity. The loss of power of a fatigued muscle to do work is, however, ascribed by physiologists not only to exhaustion of energy yielding material but also to accumulation of fatigue substances, especially lactic acid or lactates, and according to Howell, 1913, after complete fatigue of a muscle in the living body, an interval of some hours is required before the power of the muscle to perform a normal amount of work is restored. Apart from the probable persistent increase in the blood flow in the muscles after cessation of motor activity, due to the need for replenishment and elimination—an increase not necessarily as marked, however, as that occurring during motor activity—the direct chemical action of the waste product, sarcolactic acid, has been deemed by physiologists a possible cause of the local dilatation of the vessels in the muscles during motor activity, and the vascular dilatation thus induced might reasonably be expected, where accumulation of wastes in the muscles has occurred, to maintain the dilatation until elimination or destruction of the sarcolactic acid has taken place.

Preferably the physical exercise prescribed for the relief of sleeplessness should be taken in the open air, the contact of the latter with the exposed surfaces of the body tending reflexly to stimulate vasomotor activity, with corresponding vasomotor fatigue and vascular relaxation when the subject returns to the even, unstimulating, and usually warmer air conditions of the house interior. The cooler the outside air as compared to that of the dwelling place, the greater the vasomotor excitation from outdoor activities and hence the greater the vascular depression and tendency to sleepiness upon reentering the house. Even a carriage, or better, a motor ride, without any especial muscular activity, may suffice in this manner to promote sleep. Upon addition, however, of muscular activity to the exposure to outdoor air, a twofold stimulation of the circulatory functions is obtained, with correspondingly greater subsequent reaction and, from the standpoint of the brain centres, an increased derivative effect and diminished intracranial blood supply. Walking, as a soporific exercise, is as a rule effectual but in many instances too time consuming. More

suitable, except in feeble individuals, is golfing, in which the extent of motor activity and circulatory stress in a given period of time is considerably augmented, as compared to that of walking, and excitative nervous influences such as arise from business or other worries, which favor insomnia, are interrupted by reason of the attention to the game required of the player. Similar considerations apply to some degree in gardening. In horseback riding and cycling, these unfavorable nervous influences are not necessarily set aside, but the additional reflex stimulation applied to superficial tissues owing to the motion through the air may serve a salutary purpose. Tennis and swimming are occasionally applicable as sleep favoring exercises. Where sufficient out of door exercise cannot be indulged in, indoor measures such as calisthenic exercises, drills, fencing, bowling, squash, etc., are sometimes of service. A short, brisk walk in the evening may be of value to pave the way for the change of blood distribution attending sleep induction; especially is it likely to prove useful in subjects whose occupations are chiefly sedentary. In the relatively feeble, active exercise may be replaced by general massage, at first light, later more vigorous. Careful adjustment of the severity of exercise to conditions existing in the individual case is always an important consideration. Again, in some cases of insomnia, more particularly nervous than circulatory in their pathogenesis, exercise, especially if violent, is more likely to do harm than good.

(To be continued.)

Intravenous Injection of Foreign Protein in Acute Arthritis.—R. L. Cecil (*Archives of Internal Medicine*, December, 1917) reports therapeutic trials of foreign protein in forty cases, including twenty-six of rheumatic fever, and seven each of acute toxic arthritis and gonococcus arthritis. Typhoid vaccine was administered almost exclusively, a polyvalent gonococcus being, however, employed in five of the gonococcal cases. The vaccine, diluted so that one mil contained 100 million bacteria, was injected into the median basilic vein with a small tuberculin syringe. The dose was usually forty to 100 million, though three patients received by mistake 400 to 500 million, without an especially severe reaction or improved therapeutic result. The average number of injections in the rheumatic fever cases was 1.8; acute toxic arthritis, 1.5, and gonococcal cases, 5.5. The typical reaction was a severe chill twenty minutes to one hour after injection, followed by a considerable rise in temperature and often a secondary rise, together with headache and sometimes nausea and vomiting. During the febrile period the patient nearly always felt better, and the relief from pain continued usually for one or two days. Sometimes the heat, redness, and swelling disappeared entirely from the joints, complete recovery taking place. Oftener, however, the symptoms returned in a milder form, a second dose of vaccine being at times necessary for permanent relief. Of the thirty-three rheumatic and toxic cases, thirteen recovered completely in two to ten days without the aid of salicylates. The remaining

twenty received salicylates at some period of their attack; of these, fifteen improved under vaccine injections, but were not completely cured until salicylates were given. While the pain disappeared from the joints in many of the vaccinated patients, muscular pains persisted, particularly in the back and neck, the salicylates being resorted to for these pains. The gonococcal cases appeared influenced little, if at all, by the vaccines. No differences in reaction or therapeutic effects were noted between the five cases receiving gonococcus vaccine and the two receiving typhoid vaccine. The rise in temperature following the injections is believed by the author to be an important factor in the beneficial results.

Treatment of Subdural Hematoma the Result of War Injury.—Delanglade (*Presse médicale*, December 3, 1917) reports on two cases of skull wound by shell fragments, with subdural hematoma. The dura, upon exposure, was found blue in color, tense, devoid of pulsations, but unperforated. One patient was in complete coma, the other in a state of concussion with vomiting and mental confusion. No incisions in the dura were made, but the injured soft tissues were excised, the osseous defects regularized, and the wounds entirely closed save for the institution of filiform drainage. No complications followed. The author is inclined to agree with De Martel that primary opening of the dura is never indicated in cases of this type. Decompression is sufficient to relieve pressure, with lumbar puncture added, if required. Hasty incision of the meninges and exposure of a focus of cerebral contusion to the air opens the portals to infectious complications. A hematoma left undisturbed will probably become absorbed, and if exposure is later required, the adhesions formed will have circumscribed the morbid focus.

Blood Transfusion in War Surgery.—L. Bruce Robertson (*British Medical Journal*, November 24, 1917) used the Lindeman syringe cannula method in all but five of the thirty-six cases here recorded, in which transfusion was performed for the relief of primary hemorrhage with shock. His experience led to the following conclusions: 1. Many cases which were inoperable from severe primary hemorrhage could be made fit for operation by prompt transfusion. 2. The chief factor causing shock in the wounded was loss of blood, except where there were visceral injuries. 3. The danger of hemolysis from transfusion was slight as compared with the danger of operation in the presence of shock in military cases. 4. Certain cases which were exceedingly bad surgical risks could often be so revived by transfusion as to permit operation with good prospect of recovery. 5. Postoperative cases with progressively increasing shock from hemorrhage might be saved by transfusion. In this series of thirty-six cases transfusion was harmful in two through hemolysis; was without benefit in three; was beneficial, but not life saving, in nine; and was life saving in twenty-two. Where hemorrhage could be controlled the transfusion ought to be done at once and where this was impossible before operation transfusion should be done before removing the patient from the table. Amounts of blood up to 1,200 mils were given with safety.

Radium Therapy in Diseases of the Genitourinary Organs.—Isaac Levin (*Urologic and Gynecologic Research*, January, 1918) has treated cases of chronic urethritis with induration and swelling of the mucous follicles with fair results. Other conditions in which he has seen beneficial effects from radium treatment are stricture of the urethra, papillomata of the bladder, carcinomata of the bladder, malignant tumors of the testicle, prostatic hypertrophy and carcinoma, carcinoma of the penis, and tuberculosis of the testicle, prostate, and bladder. In papillomata of the bladder radium may be given either intravesically or by crossfiring through the skin of the abdomen or perineum and the rectum. In carcinoma of the bladder the best method of application is by crossfiring through a suprapubic opening and through the rectum. He does not consider it a specific remedy for cancer but a very valuable adjunct to surgical treatment.

Transfusion of Immunized Blood for Bacteriemia.—Henry P. Wekesser (*Journal A. M. A.*, December 29, 1917) reports a case of chronic bacteriemia due to a coccus resembling the pneumococcus, and lasting for over seven months during which all forms of treatment had been tried without avail. The bacteriemia was associated with recurring focal suppurations which yielded but slowly to surgical treatment. Finally cultures were prepared from the patient's blood, vaccines made, and four volunteers of about the same ages as the patient were immunized by five to seven doses of the vaccine given at intervals of six days. Six transfusions of 250 to 500 mils each were given to the patient from these donors at intervals of ten to fourteen days. The patient's blood cultures became negative following the second transfusion, her chills and fever subsided and she had completely recovered within two months after the first transfusion. Ten months after the beginning of this treatment the patient was still perfectly recovered and had returned to her work.

Salvarsan and Other Remedies in Ophthalmic Practice.—Freeland Fergus (*Archives of Ophthalmology*, January, 1918) states that he has formed no dogmatic opinion and is prepared to consider carefully any well ascertained facts which go to show that salvarsan is more efficacious than mercury, more lasting in its results, and does not cause any ulterior damage in syphilitic diseases of the eye, but his experience has not been such as to support such an opinion. He reports five cases, three of which help to strengthen the view that salvarsan may be specially harmful to nerve tissue. Another patient returned with an acute iritis within six months after a negative Wassermann had been produced by salvarsan, and this iritis yielded at once to mercury. There had been no chance of reinfection. The fifth case likewise was pronounced cured, with a negative Wassermann, but within eighteen months the patient was suffering from acute choroiditis, seeming to show lack of permanent value in the treatment. So far as interstitial keratitis is concerned mercury has given him much better results than salvarsan or neosalvarsan. Treatment with salvarsan is not devoid of danger, and he questions whether we are justified in taking a chance with a method which is not proved superior to mercury.

Action of Emetine on Malignant Tumors.—Richard Lewisohn (*Journal A. M. A.*, January 5, 1918) says that the theory of parasitic origin of malignant neoplasms has not yet been completely discredited and that since emetine is known to be an active amebicide it seemed worth while trying its effect on such growths. Injections of thirty mgm. doses were made directly into a recurrent mass from breast carcinoma and completely removed the mass, although the patient died shortly after from internal metastases. In a second human case injections of the drug relieved the dyspnea and reduced the swelling of the arm which were present after a breast amputation for cancer. A lung metastasis was not influenced in this patient, however. Both sarcomas and carcinomas in rats and mice were treated by emetine injected locally into the tumors, given subcutaneously, and injected intravenously. Only those injections which were made directly into the tumors themselves had any influence and it was shown that this was merely that of a tissue poison as emetine is known to be. All of the cells, irrespective of whether cancerous or normal, with which the drug came in contact in sufficient concentration were destroyed equally. While these observations do not overthrow the parasitic theory of malignant growths, they certainly do not support it.

Treatment of Brain Abscesses Following Wounds.—Villandre and Rochaix (*Bulletin de l'Académie de médecine*, November 13, 1917) report that of 450 cases of cranial trauma treated in eighteen months, sixty-one, or fourteen per cent., were complicated by infection. Forty-seven of these had cranial sinuses, recovered from under surgical treatment. In fourteen cases of brain abscess, however, six patients succumbed in spite of early drainage. In the deeper abscesses, generally setting in insidiously, brain punctures were made for localizing purposes. Where incision was not practicable or filiform drainage unsuccessful, advantage was taken of punctures to evacuate the abscess by aspiration. One subject was thus aspirated regularly every four to six days for three months. Punctures showing that these abscesses contained staphylococci, autogenous vaccines were prepared by isolating the organism, growing it one day in ordinary bouillon, and killing it by heating to 60° C. for one hour on two successive days. Local reactions sometimes being excited by a vaccine thus prepared, vaccines made from an agar culture as an emulsion with normal saline solution were eventually employed with satisfactory results. Counting of the bacteria was dispensed with, care being merely taken to use a homogeneous and opaque preparation. Injections of 0.5, one, 1.5, and two mils were administered in the thigh at four day intervals. In three cases thus treated the abscess dried out rather rapidly, or at least, in involvement of the lateral ventricle, was gradually sterilized, the contained fluid after a few weeks showing only minute flakes of fibrin, without pus corpuscles or bacteria. Recurrence of suppuration, which occurred in each of the three cases, was treated uniformly with a newly prepared autogenous vaccine. Death occurred in one case six months after the beginning of treatment, but the two other cases completely recovered.

Pyelitis Complicating Pregnancy.—Harold A. Miller (*Pennsylvania Medical Journal*, December, 1917) varies the treatment according to the severity of the condition. In the milder cases urotropin may be administered. It should never be administered in a dose less than one dram a day. The foot of the bed should be elevated and the patient turned on the unaffected side. Urethral catheterization should immediately follow any failure to get relief by the simpler method. Vaccine therapy in some cases seems to be of benefit after drainage has been established. Induction of labor may at times be necessary, but the increased danger due to the infection present should be kept in mind.

Toxicity of Neodiarsenol.—Erwin P. Zeisler (*Journal A. M. A.*, December 29, 1917) used neodiarsenol in doses of 0.6 to 0.75 gram in ten to fifteen mls of freshly distilled sterile water and observed an unusual number of severe reactions. Thus ten to fifteen patients treated complained of nausea, vomiting, headache, and fever for from one to two days after the injection. One patient showed a severe delayed reaction of the same type and another developed alarming symptoms during the injection, while a third collapsed a few minutes after injection. The local reaction with pain was so severe for forty-eight hours after the only intramuscular injection given that continuous use of morphine was required.

Physiotherapy of the Skin.—J. A. Riviere (*Urologic and Cutaneous Review*, December, 1917) includes under this term the therapeutic use of all perfected physical agents. Under this form of treatment the economy is depurated, the assimilatory and hematopoietic systems are stimulated, and the neurons are regenerated. Topical applications can only follow this general, constitutional course of treatment. It helps to prevent recidives and recurrences. It is therefore necessary in all constitutional dermatoses. It consists of hydrotherapy, balneation, massage and mechanotherapy, electrostatic or high frequency applications, inhalations of ozone, thermotherapy, phototherapy, etc. It is used in some form in the treatment of practically every skin disease.

Recurrent Dislocations of the Shoulder.—M. S. Henderson (*Journal A. M. A.*, January 5, 1918) discusses the mechanism of this troublesome condition and points out that the operation of capsulorrhaphy is curative in most cases. An extreme measure, which would be justifiable only after the failure of other methods, is the making of an arthrodesis with ankylosis of the humeral head to the scapula with the arm at a right angle. The suggested operation of resection of the head of the humerus is unjustifiable. In capsulorrhaphy the capsule is exposed by an incision along the anterior axillary fold with the arm in abduction, the pectoralis major is retracted strongly, and the capsule is reached below the tendon of the subscapularis. The capsule is incised and three or four fold No. 2 chromic gut mattress sutures are placed so that their tightening will make the two cut edges overlap. To aid in the overlapping the arm is rotated and the sutures are drawn up and tied. This operation strengthens the laxest and weakest portion of the joint capsule.

Radium in the Treatment of Epitheliomata.—Walter A. Weed (*Urologic and Cutaneous Review*, January, 1918) points out that radium is superior to the x rays as a routine method of treating because: 1, the beta ray has a much greater inhibitory effect on cancerous tissue than has the gamma ray which is analogous to the x ray; 2, the dosage may be more accurately measured, especially if used with distance applicators; 3, ulcers following the use of radium heal more quickly than those produced by the x rays and with less scarring; 4, radium can be used in many cases that are not accessible to the x ray, especially about the mouth, anus, and cervix; 5, several cases have been cured by the author that have resisted x ray treatment; 6, several cases of malignancies which have been caused by the x ray have been cured by radium.

Radium in Malignant Lesions of the Neck and Face.—Joseph H. Bissell (*Urologic and Cutaneous Review*, January, 1918) regards this as the ideal method of treatment in this location because the other methods entail mutilation, disfigurement, and loss of function. In malignancy of the thyroid the knife is of value only when the growth is confined to the capsule. Other conditions in this region that have been successfully treated with radium are lymphosarcomata, bronchial fistulae, and congenital cysts of the neck; tuberculous lymph nodes; Hodgkin's disease; tumors of the parotid; malignant tumors of the tongue; leucoplakia of the lips and tongue; cancer of the floor of the mouth and lip; cancer of the bones of the face; postorbital tumors; cancers of the scalp and cirroid aneurysm. Eleven cases of various forms of cancer are reported on.

Radium in the Treatment of Tumors of the Urinary Bladder.—Henry Schmitz (*Urologic and Cutaneous Review*, January, 1918) gives the following as the treatment of operable carcinomata: With gamma and filtered Röntgen rays irradiate the tumor, the neighboring tissues, and the regional lymph nodes. Operate, removing all visible diseased tissue. Subject the pelvis and bladder to another séance of irradiation within two or three weeks after the operation. The treatment of borderline and inoperative cases is palliative. No other treatment has the same beneficial effect on the hemorrhages, the infection, and the pain as that with radium. The character and extent of the growth must be considered in determining a correct technic and proper dosage. Gamma rays of twenty-five mgm. radium element will cause a degeneration of all carcinoma elements in a tumor occupying an area of about one centimetre in diameter and one centimetre in depth in about eight hours. If the tumor extends to a depth of two centimetres either an application of thirty-two hours or a double amount of radium element would be necessary to accomplish the same result. If the tumor extends beyond a depth of two centimetres radium applications become impracticable as the destruction of tissue due to long continued exposure would offset the benefit to be derived from a subsidence of the growth. Extensive infiltrations of neighboring structures in the pelvis can be treated only with large amounts of radium—1,000 to 2,000 mgm. of massive filtered Röntgen rays.

Mode of Absorption of Mercury Applied by Inunction.—Jay Frank Schamberg, J. A. Kolmer, George W. Kauffmann and Joseph L. Gavron (*Journal A. M. A.*, January 19, 1918) point out that it has been contended that the greater part of the absorption of mercury when applied by inunction takes place through the lungs, the mercurial being volatilized by the heat of the body. This point was tested by enclosing two rabbits in a partitioned box, rabbit A breathing only the fresh outside air, rabbit B only the mercury laden air of the box. In all other respects the conditions surrounding both animals were the same. A large depilated area on the back of rabbit A was rubbed with a mercurial ointment. In every case rabbit A promptly died of mercurial poisoning and his organs showed large amounts of the mercury, while in every case but one rabbit B survived and failed to show evidences of mercury poisoning. An autopsy on the one B rabbit showed no evidences of mercurial poisoning and no mercury was found in his organs. The experiment, repeated five times, proved that this absorption of mercurials applied by inunction is through the skin rather than through the lungs. Various preparations for application, were experimented with and it was shown that an ointment of calomel was more rapidly absorbed than the common blue ointment and had the advantage of not being dirty and staining the clothing. The formula for this ointment was:

Hydrargyri chloridi mitis,	3.0	gr. xlv
Lanolin,	1.0	gr. xv
Adipis benzoinati,	2.0	gr. xxx

For each inunction.

Permeability of Meninges to Arsenic in Paresis and Tabes.—J. Henry Barbat (*Journal A. M. A.*, January 19, 1918) calls attention to the general impermeability of the meninges to various drugs and other substances in the blood and to the fact that, in the presence of irritation, as in the various forms of meningitis, the permeability is increased. The reduction of intraspinal pressure by the removal of cerebrospinal fluid also increases the permeability of the ependyma. Applying the latter fact, the author has been able to demonstrate appreciable amounts of arsenic in the spinal fluid twenty-four hours after the intravenous injection of one of the usual organic arsenicals in twenty-five out of twenty-six cases. His technic is to give an intravenous injection of salvarsan, neosalvarsan, or arsenobenzol and to tap the spinal canal within twenty minutes after the injection, withdrawing all of the fluid which will run out until it comes only drop by drop. Following such a plan one spinal fluid, removed for test twenty-four hours after the intravenous injection and preliminary tapping, was free from arsenic, two showed only traces, while the remainder showed an average of 0.25 in a million, which compares with about eight parts in a million in the blood serum taken within half an hour of the administration of the drug. The withdrawal of large amounts of fluid does not seem to produce any more severe symptoms than follow moderate tapping. The patients are kept in bed for twenty-four hours after the lumbar puncture. This method has many advantages over the Swift-Ellis method and should give results which are as good, if not better.

Cancer of the Uterus.—J. F. Baldwin (*Ohio State Medical Journal*, November, 1917) points out that high amputation by the cautery as practised by Doctor Byrne, of Brooklyn, has given good results, but that most surgeons prefer panhysterectomy. The original Wirtheim gives the best results, but the primary mortality has been so high that the operation has never become a favorite one. Lately two methods of treatment have been advanced: the "cooking" of the cancer, in which the vitality of the cancer is destroyed by means of an electrode by an amount of heat several degrees below that which destroys normal tissue, and the treatment by means of radium which is especially of value in inoperable cases.

Ligature of Internal Iliac Artery for Secondary Hemorrhage from Buttock.—W. M. Shepherd (*British Medical Journal*, December 1, 1917) emphasizes the difficulty of trying to control secondary hemorrhage from the buttock by plugging or by an attempt to locate the bleeding vessel. In place of such unsatisfactory efforts he recommends the prompt ligature of the corresponding internal iliac artery through a transperitoneal incision through the rectus. A double chromic catgut ligature should be passed under the artery just as it bifurcates from the common trunk, caution being observed to avoid inclusion of the ureter or of the vein. Three successful cases of this procedure are reported and attention is called to the rapidity with which collateral circulation is developed after such ligation.

The Face Mask in Preventing Infection.—George H. Weaver (*Journal A. M. A.*, January 12, 1918) points out that in smallpox, typhoid, and diphtheria alone are specific measures available for preventing the spread of the diseases. In all other infectious diseases, including pneumonia, meningitis and poliomyelitis, mechanical measures and antiseptics must be depended upon. In an extensive experience with various infectious diseases brief isolation without an effort to prevent aerial convection, but with the frequent use of soap and water, the employment of separate gowns for each type of disease by both nurses and doctors, and the proper disposal of excreta and heat disinfection of bedding and clothing, there was almost no intramural transmission of the diseases. Even with diphtheria only thirteen per cent. of the nurses contracted the disease although greatly exposed. Since the introduction of the Schick test and the immunization of susceptible nurses the proportion fell to less than three per cent. The occurrence of carriers ran at about twenty-three per cent. among the nurses until the wearing of face masks was introduced when it promptly fell to only eight per cent. The masks used were made of two layers of gauze and shaped to fit snugly over the mouth and nose. The masks were never worn twice until sterilized and washed and were always replaced when evidently contaminated or when they became moist. The wearing of these masks by both nurses and doctors during an epidemic of meningitis entirely eliminated the development of nasopharyngeal carriers among both groups. The value of the use of masks is established, and it is suggested that they be used also in the presence of pneumonia and poliomyelitis.

Miscellany from Home and Foreign Journals

Paroxysmal Tachycardia, of Ventricular Origin.—F. A. Willins (*Boston Medical and Surgical Journal*, January 10, 1918) says that paroxysmal tachycardia of ventricular origin is a rare condition, occurring in only 0.047 per cent. of all abnormal electrocardiograms recorded in the Mayo Clinic. Two cases revealed conduction impairment. As an etiological factor, history of infection with the streptococcus group was elicited in four cases. The symptomatology in all cases was very uniform, palpitation, tachycardia, and exertion dyspnea being complained of by all the patients. Vertigo attended the paroxysms in three cases. The average pulse rate during the paroxysms was 174. One case coming to necropsy revealed distinct atheroma of the left coronary artery, which is significant. As life is dependent on ventricular and not on auricular action, this condition must be considered potentially grave. Digitalis medication in two cases treated did not affect the abnormal rhythm.

Examination of the Mouth for the Detection of Syphilis.—G. Railliet (*Paris médicale*, November 24, 1917), examining 103 men, nearly all between the ages of thirty-five and forty-six years, for oral evidences of syphilis such as leucoplakia, hypertrophy of the buccolabial glands, the mammillary eminence on the internal aspect of the first upper molars, emphasized by Sabouraud, and the folded or fissured tongue surface, recognized by Gaucher as a sign of acquired or inherited syphilis, found one or more of these signs in no less than seventy-six of the series, only twenty-seven men being completely free of them. In forty-nine men but one sign was present, while in twenty-eight two or more of the signs were variously combined. The mammillary eminence was present alone in two subjects; folded or fissured tongue alone in seventeen; leucoplakia in twenty-two, and hypertrophy of the buccolabial glands in eight. In general, these lesions were not more pronounced when combined than when present singly. Incidentally noticed in occasional cases were a congenital perforation of the vault of the palate, septal deviation in two cases, nocturnal headache in one subject, and a papilloma of the left commissure with enlarged glands in one instance. Enlarged epitrochlears, however, were in no instance met with. Expressed in percentage figures, leucoplakia was present in no less than 42.8 per cent. of all men examined. Fournier ascribes ninety to ninety-five per cent. of all cases of leucoplakia to syphilis. In the present series leucoplakia coexisted with the mammillary eminence in four cases, with the folded tongue in eleven, and with the fissured tongue in seven. The mammillary eminence was observed in 38.09 per cent. of all the subjects, the folded or fissured tongue in 36.89 per cent., and the enlarged buccolabial glands in 14.56 per cent. According to these figures nearly one half the men examined were slightly or markedly tainted with syphilis. To be sure, in many instances the infection was present only in a highly attenuated form, many of the men examined declaring themselves to be fathers of healthy children born at term.

Paralysis of Recurrent Laryngeal Nerve in Mitral Stenosis.—George E. Brown and Bert E. Hempstead (*Journal A. M. A.*, January 5, 1918) call attention to the fact that it is only since Ortner's report of a case in 1897 that it has been known that the left recurrent laryngeal nerve could be paralyzed through cardiac enlargement. Since then only eleven cases of paralysis due to mitral stenosis have been reported in which there was necropsy confirmation, although many have been placed on record in which the diagnosis from clinical evidences was very certain. The nerve is so placed that it can be compressed between the aortic ligament and the left pulmonary artery by any cause which will dilate or press upward the left auricle. A case is reported occurring in a young woman who was suffering from mitral stenosis, auricular fibrillation, and mildly broken compensation. Under prolonged rest in bed, the use of an ice bag, and the administration of digitalis the cardiac compensation was restored and the size of the heart so reduced that the pressure was relieved on the nerve with ultimate complete recovery from the paralysis. This is the only case on record in which the diagnosis was made early enough to reestablish nerve function.

Toxic Gases, Urticaria, and Tuberculosis.—Marcel Pinard (*Presse médicale*, November 22, 1917) calls attention to a number of cases seen by him in military practice, in which an evanescent urticaria had, in the earlier instances, led to a provisional diagnosis of some digestive disorder. When one patient, however, came for treatment only after gangrene of the prepuce had already become established from an accompanying paraphimosis, more careful studies were made and the fact brought to light that all the patients had been exposed to toxic gases twelve to fifteen days before the onset of urticaria. A special feature of these cases was edema of the genitals, occurring in conjunction with the diffuse urticaria. To account for the special involvement of the genitals, the possibility that the gases might have come in contact with the skin surface particularly in this region because of a tear in the trousers or to their not being buttoned, or because of humidity, was thought of. The diffuse distribution of the urticaria, however, invalidated this conclusion. Three patients were found to present signs of apical tuberculosis, such as dullness or impaired resonance, diminished or staircase breathing, atrophy of the trapezius, slight myxedema, and interscapular varicosities. Probably some form of sensitization of the organism is a preliminary requisite in the production of urticaria, and in these cases a latent or slight tuberculous involvement in the lung, pleura, lymph nodes, or other structures should be held accountable for the development of urticaria from exposure to toxic gases. Landouzy repeatedly called attention to the unusually marked skin reactions induced in the tuberculous by injections of serums or even of distilled water. In some of the cases previous serum injections might have been responsible for the unusual susceptibility to urticaria.

Distribution of Meningococci in Upper Respiratory Tract in Carriers.—R. D. Herrold (*Journal A. M. A.*, January 12, 1918) investigated the occurrence of meningococci in the various portions of the upper respiratory tract in a series of ninety-three segregated carriers. The percentage of positive cultures obtained from the nasopharynx was about seventy-one, from the tonsils about thirty-one, from the anterior superior nares seventeen, and from the sputum nearly thirteen. In about twenty-five per cent. of the cases cultures from the tonsil were positive while those from the nose and sputum were negative, while in half as many the nasal cultures were positive and those from the tonsil and sputum were negative. After a period of six weeks in seventy-three per cent. of the cases there were positive cultures from the nasopharynx and elsewhere; in sixty-three per cent. the nasopharynx was positive and other cultures negative; and in about fifty-five per cent. the nasopharynx was negative while other cultures were positive, the percentage here having been calculated upon the numbers originally found in these three groups. The results showed that while the nasopharynx was the commonest location of the organisms in these carriers, the carrier state persisted longer the wider the distribution of the organisms in the upper respiratory tract.

Spontaneous Rupture of the Renal Artery.—W. A. Lincoln (*Journal A. M. A.*, January 12, 1918) reports the following case of this rare accident. The patient, a man sixty-four years old, with a negative past history, was suddenly seized with a severe pain in his right side, followed by vomiting. The temperature remained normal, vomiting was not repeated, the pain remained intense, and when seen twenty-four hours later his right side was fuller than the left, somewhat tender, and extremely rigid throughout. Upon exploratory operation a small amount of blood was found in the peritoneal cavity, the cecum was infiltrated with blood, and a large, fluctuating hematoma occupied the right side behind the peritoneum. Through a kidney incision the blood clots were partly cleared away when a profuse, fresh hemorrhage occurred. This was controlled by clamps and ligatures and the remaining blood washed away, when it was found that the ligatures were on the renal artery about one inch from the kidney. The patient survived the operation, though in severe shock, but died a few days later from failure of the opposite kidney. Autopsy confirmed the location of the ligatures and revealed a rupture of the sclerosed renal artery. Fourteen other cases of spontaneous rupture of the renal artery have been reported, but the present is the only one in which the bleeding was actually seen to be taking place. The common result of such ruptures is the formation of true or false aneurysms, some of which may not give rise to any symptoms during life. In some cases the rupture has taken place into the renal pelvis with free or even fatal hemorrhage from the bladder. In others, like the present, the rupture has caused a large hematoma behind the peritoneum. In no case was the correct diagnosis made during life. It would seem that prompt operation when suspicion was aroused might be expected to save a certain proportion of such cases.

Selection of Donors for Transfusion.—Roger I. Lee (*British Medical Journal*, November 24, 1917) points out that persons may be classified in respect of the compatibility of their bloods into four groups. In Group I the red cells are agglutinated and hemolyzed by the serum of all three remaining groups; those of Group II by serum of III and IV, but not by I; those of III by serum of II and IV, but not by I; and those of IV by none of the other serums. Thus a person in Group I can receive blood from any of the others because his serum does not hemolyze or agglutinate the cells of any other group and a person in Group IV can give blood to a person in any other group because his cells are not affected by serum from any other group. For routine purposes serums of the last three groups should be kept on hand for testing and available donors in the hospital should be tested and their names and groups posted for reference. In emergency, when the recipient's blood cannot be tested a donor of Group IV should be selected, otherwise compatible bloods from Groups II or III should be used to save the Group IV persons.

Pathological Features of Wounds of the Lung.—R. Grégoire and A. Courcoux (*Presse médicale*, November 29, 1917) agree with Latarget that in simple puncture wounds of the lung causing immediate death the tissues surrounding the wound cavity show three concentric zones. The inner zone exhibits signs of marked destructive tissue injury, the alveolar constitution of the tissue being no longer perceptible, and the vessels and bronchi visibly torn asunder; in the outer portion of this zone, however, flattened out alveoli are to be seen, containing no blood cells. The second zone is characterized by marked hemorrhagic infiltration, with indistinct alveolar margins. The third zone, beginning by gradual transition from the second, is marked by absence of hemorrhage and by confluence of neighboring alveoli, an appearance of emphysema resulting. In specimens obtained only after the lesion had existed several days, the inner zone always was lined with fibrinous exudate and a layer of round cell infiltration. The second or hemorrhagic zone constituted an actual hematoma, infiltrating the surrounding lung parenchyma excentrically and rupturing the alveolar walls; at the outer margin of the second zone, however, the alveoli had failed to rupture and were filled with erythrocytes. The third zone, unless compressed by a coexisting hemothorax, presented normal alveoli containing a little albuminous exudate and a few transuded cells. At times a second hemorrhagic zone was noted apart from and surrounding the first. Where the missile has caused a marked laceration or bursting of lung tissue, hemorrhage may be so violent as to press together and flatten out the elastic fibres into a barrier which prevents marked infiltration of the alveoli with blood. Conditions that may be associated include lung collapse due to hemothorax, chiefly in relation to the lower lobe; occasionally localized atelectasis, due to pressure on a bronchus or to occlusion by a clot; and sometimes a condition of hepatization around the hematoma, which, however, the authors ascribe to congestion rather than a traumatic pneumonia. No true pneumonic area was, in fact, ever observed around the hemorrhagic focus.

Growth of *Bacillus Welchii* in Presence of Oxygen.—C. G. L. Wolf and J. E. G. Harris (*Lancet*, November 24, 1917) record a series of experiments in which they show that the *Bacillus welchii* is capable of growth in suitable mediums without the usual precautions to secure anaerobic conditions. If the fluid mediums is freshly sterilized the proportion of dissolved oxygen is reduced to a point at which the organisms can develop and once they have begun to multiply the liberation of hydrogen and carbon dioxide serves to drive off the remaining oxygen and to prevent the further solution of oxygen from the air. The only other precaution necessary, beside the fresh sterilization of the medium, is the use of rather narrow test tubes, which should be kept in a vertical position.

Frostbite as a Predisposing Factor in Carcinoma.—Richard L. Sutton (*Journal A. M. A.*, December 29, 1917) points out the fact that the occurrence of frostbite is a decided predisposing factor in the development of carcinoma, the parts most commonly involved being the ears and cheeks. Thus of forty-six cases of seborrheic ceratosis of the ears and cheeks seen during 1917, twenty-seven gave a history of frostbite and twenty-one showed one or more malignant growths on the affected regions. The great reduction of temperature would seem, not only to predispose to the development of cancer in these locations, but also, through reduction of the local tissue resistance, would appear to influence the prognosis of cancer unfavorably.

Special Forms of Tuberculosis in the Child.—Juan C. Navarro (*Revista de la Asociacion medica, Argentina*, August, 1917) remarks that the more one studies the question, the more one is convinced that infantile tuberculosis is vastly more common than was until recently supposed. Dyspnea is rare, and cough, while fairly constant, is variable, rarely painful, usually loose, and sometimes absent. Two symptoms attracting attention are anorexia and loss of weight with lassitude, while pallor and a fair degree of nutrition are the rule, the extent of the tuberculous lesion being usually greatly out of proportion to the subjective symptoms and the general physical condition. Auscultation reveals bronchial breathing with an amphoric note and moist râles which may vary from the finest subcrepitant to the largest moist type.

Röntgenological Diagnosis of Primary Carcinoma of the Lung.—F. B. McMahon and R. D. Carman (*American Journal of the Medical Sciences*, January, 1918) describe three main types of primary carcinoma of the lungs which present characteristic gross pathological appearances: the infiltrative, the miliary, and the mixed. The Röntgen examination and the stereoscopic study of röntgenograms will early point to a pulmonary lesion and its probable nature. The areas of increased density found in primary pulmonary carcinoma are usually quite typical and can be differentiated from areas of increased density caused by other diseases in the thorax, including inflammatory changes and neoplasms, both primary and metastatic. A careful correlation of the Röntgen findings with the clinical history and the physical and laboratory findings usually makes a clinical and differential diagnosis possible.

Disturbed Blood Coagulability in Ictero-genous Spirochetosis.—P. Pagniez (*Presse médicale*, November 8, 1917) found retarded coagulation in all severe cases. The process of clotting sometimes required as many as twenty minutes. Diminution or complete absence of retraction of the clot was an especially noticeable feature. This peculiarity is ascribed to a marked reduction in the number of blood platelets, which sometimes fell to less than 10,000 per cubic millimetre, as compared to the normal 200,000.

Infantile Cystitis.—J. Vecina y Lopez (*Archivos de medicina interna*, September, 1917) says that the bacteria in the bladder do not cause cystitis without some predisposing factor such as a debilitated state of the bladder walls from distention by retention of urine, circulatory irregularity, the presence of a calculus, or foreign body. Cantharides plasters should never be used in infancy as the tender skin absorbs the cantharidin which in the process of elimination inflames the bladder. Gastroenteritis is almost always accompanied by a cystitis, as is also vulvovaginitis and the urethritis produced by masturbation with foreign bodies in the urethra.

Influence of Pregnancy on the Development, Progress, and Recurrence of Cancer.—William Seaman Bainbridge (*American Journal of Obstetrics*, January, 1918), from clinical observations, a review of the literature, and from experimental data, has become convinced that pregnancy increases the rapidity of growth of coexistent spontaneous cancer. If, as some contend, there is a retardation of the malignant process during gestation, this should not be understood to imply that a rapid increase of growth may not follow delivery. Although the stimulating effect of pregnancy is exerted most markedly upon the organs directly concerned with the pregnant state, the progress of cancer in any other part of the body may be similarly accelerated. If the cancer is removable, in order to secure the best chance of permanent cure the pregnancy should be terminated, regardless of any consideration for the child. Even in advanced cases of malignant disease, without hope of cure for the mother, Bainbridge questions whether she should not be given whatever chance of relief and prolongation of life an abortion may afford.

Subacute and Chronic Nontuberculous Pulmonary Infections.—James Alexander Miller (*American Journal of the Medical Sciences*, December, 1917) gives as the chief points which serve to distinguish these lesions from those of tuberculosis: 1, complete absence of severe constitutional symptoms with the retention of excellent general condition in spite of the presence of extensive lesions; 2, the localization of the lesion with almost constant uniformity in one or both of the lower lobes; 3, the disappearance of all physical signs within a few months in the subacute cases; 4, the lack of progression of the lesion from its original site to other parts of the lungs; 5, the absence of tubercle bacilli in the sputum over long periods of time and the presence of other infectious organisms in predominating numbers; 6, the character of the Röntgen ray picture, which in these cases shows either nothing or very slight changes.

Clinical Determination of the Toxicity of the Urine.—Billard and Perrin (*Bulletin de l'Académie de médecine*, November 27, 1917) with a view to directing the treatment and tracing its beneficial results in conditions associated with high urinary toxicity, advocate determinations of the surface tension of the urine, the toxicity having been observed by them to vary according to the surface tension of the individual specimen. This test, which can be simply performed, is intended to replace an older procedure, viz., estimation of the amount of urine required to kill a rabbit upon injection into the marginal vein of the ear. The technic consists merely in ascertaining the specific gravity of the urine and counting the number of drops yielded by five mils of urine when dropped from Duclaux's pipette. The actual surface tension in milligrams is obtained by multiplying the specific gravity by 100, the product by 7.5—the surface tension of water—and dividing the last product by the number of drops from the pipette. The lower the surface tension, the higher the degree of urinary toxicity. The extreme values of the surface tension among the specimens examined were, at 15° C., 4.7 and 7.45 mgm.

Rapid Method for Isolation and Identification of Meningococci.—Peter K. Olitsky (*Journal A. M. A.*, January 19, 1918) describes a simple and rapid method for the isolation and identification of meningococci from the nasopharynx which eliminates the other organisms which resemble it in twelve hours and shortens the time of identification by a full day. A one per cent. glucose veal broth with a phenolphthalein acidity of 0.5 to 0.7 is prepared and to it five per cent. of sterile, unheated, normal horse serum is added. One mil of this medium is placed in each of a number of small tubes, eight to ten millimetres in diameter and nine millimetres long. The usual Petri plate cultures are made from the throat and suspicious colonies are carefully fished from this plate and sown into the small tubes described, only one colony to a tube. These tubes are incubated for twelve hours or over night. At the end of this time those cultures containing *Micrococcus flavus*, *Micrococcus crassus*, *Micrococcus pharyngis siccus*, and an unclassified Gram positive bacillus will show firm agglutination, due to the presence of the horse serum, and can at once be excluded. The *Bacillus influenzae* will not have grown if present on account of the absence of hemoglobin; and the *Micrococcus catarrhalis* tubes will show dense turbidity. The cultures containing meningococci will show faint turbidity and slight sediment which emulsifies uniformly when shaken. To each of the tubes evidently containing meningococci and to those which are suspicious 0.1 mil of a 1:10 dilution in normal salt solution of a high titre, polyvalent antimeningococci serum is added. The tubes are then incubated for two hours at 37° to 38° C. in a water bath. The reading of the tubes is then simple and definite, for those containing meningococci show definite agglutination while the others do not. Transplants from the positive tubes may be made on to other mediums for further study or to prepare stock cultures.

The Relation of the Diet, the Blood Cholesterol, and the "Lymphoid Defense."—Georgine Luden (*Journal of Laboratory and Clinical Medicine*, December, 1917) reports a series of experiments covering over six months and reviews the work of other observers. The influence of the chemical composition of the food on the chemical composition of the blood in changing the amount of cholesterol therein is shown, as well as the fact that a diet increasing the blood cholesterol at the same time weakens the lymphoid defense, while a diet decreasing the blood cholesterol increases the lymphoid defense. Luden points out that an increase of the cholesterol and a weakening of the lymphoid defense, such as may be the result of a prolonged use of certain diets in persons predisposed to carcinoma, may perhaps lead to its development. It is suggested that dietary measures which aim at reducing the blood cholesterol and increasing the lymphoid defense may prove of value in the treatment of carcinoma.

The X Rays in Phthisis.—George W. Holmes (*Boston Medical and Surgical Journal*, January 17, 1918) says that an opinion based upon Röntgen evidence alone is of about the same value as an opinion based upon the physical findings alone. Without a careful history both lose much of their worth; combined with other evidence the x ray may be of great value, as without doubt it is capable of revealing changes in the lungs which cannot be demonstrated by any other method. The examination of the chest divides itself into two principal methods, fluoroscopy and radiography. The study with the fluoroscope has the advantages of being cheaper, and of being more easily and quickly done. The image seen is that of the living, moving organs, and it gives data which could not be obtained from the photographic plate, such as the movements of the diaphragm, the lighting up of the lung fields during respiration, the pulsation of the different chambers of the heart, and possible changes in the shape of dull areas in the lungs during change of position of the patient. Its disadvantages are the inability to study carefully the detailed structure of the lungs and the fact that it does not give a permanent record. Those interested in the case must rely on the personal judgment of the radiologist, whereas with the plate a joint study is possible. The radiographic method has the advantage of giving an accurate, permanent record of the condition within the chest, and should show any variation from the normal which gives rise to change in density. Sufficient data may be obtained from a single plate or several may be needed, and in a large number of cases stereoscopic plates should be taken. The ideal method seems to be a fluoroscopic examination, when definite records are made of the excursion of the diaphragm, changes in the shape of abnormal shadows, and illumination of the lung fields during respiration and coughing. Then, if the diagnosis is in doubt or negative, stereoscopic plates are made with the patient sitting and the tube behind. Should the fluoroscopic findings be fairly definite, a single plate taken in the position which best shows the pathological process will be sufficient.

Proceedings of National and Local Societies

THE COLLEGE OF PHYSICIANS OF
PHILADELPHIA.

Meeting Held Thursday, December 6, 1917.

The President, Dr. RICHARD H. HART, in the Chair.

Epidemic Poliomyelitis.—Dr. SIMON FLEXNER, of New York, stated that epidemic poliomyelitis, or infantile paralysis as the disease was variously and erroneously called, had become more prevalent throughout the world. This wide distribution could be attributed to the endemic focus in northern Europe becoming more and more active, which culminated in the severe epidemic outbreak in Sweden in 1905. The severe forms of the epidemic disease and the occasional and sporadic instances of infantile paralysis were essentially the same diseases, due to a common etiological agent. As long as the disease was conceived of as one attended by paralysis a large number of cases would be excluded. Thanks especially to Wickham, we had learned that perhaps the majority of cases in epidemic times were not associated with paralysis. Doctor Flexner defined epidemic poliomyelitis, so called, as an acute infectious and communicable disease, attended sometimes but by no means always, with involvement of the central nervous organs, as a result of which incident paralysis often resulted. The parts of the central nervous organs most frequently involved were the meninges, with which might be and often was associated injury to the gray matter of the spinal cord and brain, leading to muscular paralysis. In its essential nature the disease was an infection. A minute anaerobic microorganism had been secured which fulfilled Koch's law of causation. He felt, however, that it was better to wait until this experimental work had been confirmed in other countries in which epidemic poliomyelitis occurred before proclaiming the microorganism as the established cause of the disease. Of first importance was the discovery of the manner in which the microbic cause of poliomyelitis entered and left the body. The infectious agent entered and left the body by the upper respiratory mucous membrane and might at least leave the body with the intestinal discharges. Whether there were still other avenues of infection was not known; neither was the tendency of the disease to reach its height in the late summer and early autumn months understood, though intensive study was showing that the disease extended throughout the winter, and in two instances midwinter epidemics occurred in Sweden and Norway. Under the circumstances the disease was to be regarded as communicable from person to person. A simple, readily applied, biological test to determine the presence of poliomyelitis was greatly to be desired. Lumbar puncture in ninety per cent. or more of instances gave a definite answer, yielding a fluid, usually clear, but showing either morphological or chemical changes, or both these changes simultaneously. The mononuclear cells tended to be increased and globulin often was present. These changes, especially during periods of epidemic, should be regarded as presumptive evi-

dences of poliomyelitis infection. As a beginning was being made in respect to specific form of treatment, the employment of lumbar puncture and study of the changes in the cerebrospinal fluid were affording the basis for the application of treatment at the more favorable periods, before possible paralysis had appeared, which might often determine whether the treatment would be effective or not.

Some Practical Considerations in the Administrative Control of Epidemic Poliomyelitis.—Dr.

HAVEN EMERSON, commissioner of health of New York, said that there were obvious limitations to the application of scientific laboratory and clinical knowledge in the public control of communicable disease. Furthermore, when the means of transmission, immunization, and detection of carriers of a disease were lacking, the resources of the public health officer were sadly restricted. The use of popular educational publicity would go far to teach parents the necessity of obtaining competent medical advice immediately upon the appearance of fever, pain, digestive disturbance, or acute symptoms of any kind in little children. To the adoption of such advice we might attribute the reduction of infectious diseases. A type of direct, practical advice to the public was given in an extract from a circular of information. When such advice had been given the most unexpected and extravagant applications of it might ensue, as evidenced in many a family of children housed for weeks, often in tight shut rooms even in July and August. Up to the present there was no evidence that environment had any relation to the origin or dissemination of poliomyelitis. We had no specific diagnostic test, though examination of the spinal fluid, a good history, and definite clinical symptoms would, during an epidemic, even in the absence of paralysis, justify a positive diagnosis. In a disease so little seen or recognized in the past in general practice it was not uncommon to miss that agreement among physicians without which it was impossible to obtain public compliance with restrictions or professional cooperation with health officers. The prompt issue of leaflets of information to physicians early in the epidemic would enlist their cooperation and give the essential facts in a form ready for reference. Such a circular of information was given in the paper. Six weeks had been generally agreed upon as a suitable isolation period dating from the day of onset, the only adequate basis for this being that after six weeks infectious material had rarely been obtained from artificially infected monkeys. There were too many undetermined factors to draw conclusions upon the effect of hospitalization upon the distribution of poliomyelitis in New York, although observation led us to believe that hospitalization decreased the case incidence of the disease. Health officers owed it to the practitioner of medicine to give him every facility to study the clinical phases of the disease. As to general measures of personal restraint directed to the abatement or prevention of an epidemic we were more at sea than in the field of individual quarantine. The

identification of travelers was reasonable but its incompleteness under modern conditions of traffic renders its advisability questionable. Of absolute quarantine Doctor Emerson recalled the instances of inhumanity resulting from its application to counties, towns, and States against each other. He knew of no benefit from such measures and of nothing which had developed such ingenuity in the violation of the laws and such whole hearted disrespect for reasonable sanitary law. General reporting by the health officer at the point of departure to the health officer at the point of destination of travelers under the age of sixteen years would probably accomplish all that could be expected. While awaiting the receipt of the essential information which would justify a logical and efficient administrative control of epidemic poliomyelitis, the health officer of any community could hardly do better than plan his campaign in accordance with the declaration of the American Public Health Association. As a matter of historical interest and to present the result of the experience of the Department of Health of the City of New York the paper also gave the test of information for field workers which described the procedure in the various phases of work last summer.

Dr. C. H. LAVINDER, of the U. S. Public Health Service, said that not only was knowledge of the mode of transmission of poliomyelitis imperfect, but we also lacked means of accurate diagnosis and had only incomplete information regarding the incubation period of the disease. In a study of the mode of transmission of disease laboratory research work and epidemiological field studies should supplement each other and their results should be in full accord. The United States Public Health Service in the recent epidemic of poliomyelitis desired to take an extensive view of the New York epidemic, taking New York city as its centre, and studying the development of the disease in adjacent States. In order to obtain a cross section of the epidemic it undertook the intensive study of cases in several places, the total number being more than 700. While at this stage the studies did not justify broad conclusions, many factors indicated that poliomyelitis was a contact infection. From the study of spot maps it seemed quite evident that the disease followed travel routes; moreover, that the disease spread in waves from a centre outward. It was also observed that parts of the population escaping the disease were composed of persons less in contact with the general public than others. These and other factors pointed strongly to the contact theory of the transmission of poliomyelitis. Spinal puncture was a method deserving much wider use in this disease than it had had. Poliomyelitis had been reportable in most of the States since 1909, since which time to 1914 inclusive there had been 5,239 deaths from the disease. There had been probably from 1900 to 1915, 40,000 to 45,000 cases. This year there were certainly in the United States 35,000 cases with a much higher mortality, indicating that the disease was likely to be one of the important epidemic diseases of childhood. In attempting to meet the difficulties it would seem wise to be perfectly frank with the public; then no one would expect

the brilliant results which at the present time were impossible.

Dr. WILMER KRUSEN, director of health, of Philadelphia, stated that from June 1 to December 1, 1917, the total number of reported cases of anterior poliomyelitis in Philadelphia was 997; many abortive cases had not been reported, in which diagnosis was perhaps impossible. The total number of deaths was 297, a percentage of 29.2. Of the 224 patients treated at home, 125 died, a mortality of 53 per cent.; of the 763 treated in the hospital, 172 died, a mortality of 22.5 per cent. It must be admitted that many of the patients dying at home were in a very serious condition when the disease was determined. Density of population apparently had no influence upon the incidence of the disease in a given locality. The twenty-second ward of the city with a population of ten per acre had seventy-eight cases; the third ward, one of the so called slum districts, with a population of 210 per acre, had only ten cases. Regarding the onset of the disease, 51.4 per cent. of the cases occurred in August; 8.9 in July; 31.9 in September; 7.7 in October; 1.5 in November. The popular belief held at the beginning of the epidemic that the colored race was immune had not been borne out since there were twenty-three cases among colored children with eight deaths. Eighty-eight per cent. of children affected were under six years of age. A point of special significance suggested by the chief of the Bureau of Health was the diminution of fifteen inches in the average rainfall of the present year.

Dr. THEODORE H. WEISENBURG, of Philadelphia, said that the 800 cases in the municipal hospital afforded an exceptional opportunity for studying infantile paralysis. In many instances they studied also the localities and houses from which the patients came, of both the frank paralytic and the abortive types. In the beginning of this study Doctor Weisenburg had no doubt of the contagiousness of the disease, but he now believed that the disease was not so contagious as Doctor Flexner, Doctor Emerson, or Doctor Lavinder held. The best argument against contagiousness was the multiple instances of the disease occurring in the same family. We observed that when more than one person in the family was stricken, the symptoms appeared within one or two days of each other. His experience with the abortive cases was similar. It was not his experience that a number of persons coming in contact with the disease afterward developed it. Moreover, when the schools were opened in Philadelphia in September there was not an increased number of cases as was expected, but the disease gradually diminished. Doctor Emerson's suggestion regarding the postgraduate study of the disease in municipal hospitals was a very valuable one. Should poliomyelitis reappear in Philadelphia such an opportunity should be given to every physician.

Doctor Weisenburg quite agreed with Doctor Emerson regarding what he termed the brutal quarantine in the different cities and States. He was entirely opposed to interstate quarantine. To his mind nothing could be gained by keeping healthy children from their homes. He was strongly in

favor of isolation of the individual patient. In his experience lumbar puncture was practically the only therapeutic measure of value and the earlier its use the better. The average physician outside a large city feared to perform lumbar puncture, yet the quarantine measures absolutely forbade the patient being brought to the city where such treatment could be given.

Dr. THEODORE LeBOUTILLIER, of Philadelphia, working with the cases of poliomyelitis as they came into the Philadelphia Hospital for Contagious Diseases, said that the first step was to do a lumbar puncture. This measure was not only one of the best methods of diagnosis but also of treatment in this disease. It relieved congestion, pressure, and in many cases, pain to a marked degree. To be efficient lumbar puncture should be done frequently, as it might be demanded by each individual case. This might be once in twenty-four hours for some days, once a week, or once in two weeks. In a case studied by the physician in charge it was frequently very easy to tell when lumbar puncture should be done. The child complained of some pain, became restless, had a poor appetite, and possibly had some headache. In nine cases out of ten lumbar puncture would relieve the condition. Of course, the fluid should be studied for the cell count. Children who had recurrence of pain, irritability, and restlessness, three and four months after the onset of the disease would be readily relieved if lumbar puncture was again done. Such a case was seen three months after the original attack. Doctor LeBoutillier also believed serum was helpful in many cases. Serum from the blood of patients who had had the disease some months or years previously has saved the lives of some patients. In other cases in which it had been given too late or in insufficient quantity or in which it had not contained the antibodies expected, the results had not been so good. They had had practically no bad results where the serum had been given. They could not obtain enough of the serum to give it as a routine measure in the quantities desired. They had used a combination of adrenalin chloride intraspinally and the serum intravenously, and results had been better than when only one or the other was used. It was to be hoped that during 1917 a serum might be produced which if not so efficient as the diphtheria antitoxin would at least be more helpful in the control of these cases than anything so far discovered. He emphasized the importance of early diagnosis, the use of lumbar puncture both as a diagnostic and a therapeutic measure, and the importance of not being afraid to employ this method too frequently.

Dr. G. G. DAVIS, of Philadelphia, stated that apart from the standpoint of the cause and spread of poliomyelitis, its management was important in that it cast upon the community a large number of cripples with all the consequent deleterious effects. Those who were familiar with the original type of the disease regarded it as an acute trouble for a few days with immediate onset of flaccid paralysis and abrupt cessation of the acute symptoms. The cases fell at once to the care of the orthopedic surgeons. As Doctor Flexner had said, the disease

was not at present what it had been. We had now the acute onset, the convalescence, and the chronic stage of the disease. The acute stage should be treated by the physician. He should have in consultation a person accustomed to guard against the oncoming deformity. Even inside of six weeks provision should be made in some cases against the contractures which would probably occur. In the stage of convalescence the family physician might be the attendant and he would be confronted with a disease which to the most experienced in its special character was baffling. Doctor Davis urged that these cases be watched by some one skilled in orthopedics and possessing infinite perseverance and patience. His experience was that improvement did not cease at the end of two years, but that these patients continued to improve as long as we continued to work with them throughout a number of years. Apparatus was used for the prevention of deformity and to facilitate locomotion. Even when employed constantly it did not hinder in any way the recovery of the child. He knew of no cases in which so much could be done as for patients in whom the paralysis was often very marked.

Dr. CHARLES K. MILLS, of Philadelphia, referring to the question of the communicability of the disease, agreed with Doctor Weisenburg. He believed the disease was one which we should term as an infectious disease, probably transmissible by human contact. It was striking that Wickham, notwithstanding his protests against the doctrine of insectile transmission and in favor of the personal contact theory, gave scarcely a fact in connection with the environmental condition in which his hundreds of cases occurred. He discussed at length the fact that the disease spread along lines of travel, which argument was open to very evident objections. He described the manner in which the disease radiated from schools regarded as foci but failed to give any facts so far as Doctor Mills recalled, regarding the condition of the schools and their environment and the condition of the houses and the localities from which the children came. During the present epidemic, with an entomologist and others, Doctor Mills made many personal investigations of the localities in which the cases occurred, including between 300 and 400 cases occurring in about twenty wards of the city and in Chester, Montgomery, and Delaware counties. In ninety per cent. of the localities studied he was struck by the presence of insanitation and insectile life. He looked forward with great anticipation to the publication of the field work of the United States Public Health Service. In the vast majority of the thirty-five or forty diseases caused by insects, the host, the carrier, and the nature of the disease had been largely revealed by good field work. Multiple cases in the Philadelphia epidemic occurred in a way which indicated that they were due to a common infection in the majority of instances.

Dr. H. A. HARE, of Philadelphia, believed, as a result of observations last summer, that we should never have control of epidemics until we had Federal control. Orders were given in Rhode Island to quarantine against "suspected districts,"

morning (see, Vol. 1). At the time quarantine was established there was a larger proportion of cases to the total population in Newport than in New York, yet Newport was not quarantined. A health officer of the State warned the hotel keepers that if such quarantine were instituted business would be hurt and appealed to them to do nothing to keep people out of Rhode Island. Had the State of Rhode Island been under Federal control local people would have had no political pull to interfere with proper ordinances. The thing reached the height of absurdity when a certain number of inspectors were ordered to board and walk through trains and determine whether any of the children on board had poliomyelitis. Regarding the transmissibility of the disease the question arose whether some of our difficulties did not lie in the fact that the disease was transmissible only at certain periods of its existence. At one time we did not know that yellow fever was transmissible until after a certain stage of development.

Dr. A. C. ABBOTT, of Philadelphia, with all due respect to the opinions that had been expressed upon the mode of transmission of this disease, felt that the matter was still unsettled. The question of the seasonal occurrence of the disease had not been satisfactorily answered. While the charts showed that the maximum occurred about midsummer and fell off toward early autumn, disappearing as cold weather advanced, the epidemic in Sweden presented a conspicuous exception to this. Every natural law had an occasional exception. Doctor Abbott did not recall the circumstances surrounding the outbreak in Sweden in cold weather. He thought it was significant that in Philadelphia a large majority of cases were in the parts of the city having the largest number of stables. Another interesting factor was the opening of the schools: although there were from seven to ten new cases of poliomyelitis a week there was no increase in the number of cases when the schools opened, and they had rather steadily diminished. He did not doubt that direct transmission occurred from person to person in poliomyelitis, or that there might be human carriers, but he did not believe that these were the only ways in which the disease was spread.

Dr. JOHN A. KOLMER, of Philadelphia, said that since the appearance of anterior poliomyelitis in Philadelphia, Doctor Freese, Doctor Brown, Doctor Matsunami, Doctor Meine, and he had conducted investigations which had shown that a streptococcus and a diplococcus occur in a large percentage of cases of poliomyelitis in the brain, cord, and various internal organs. The experiments had failed without exception to produce experimental poliomyelitis with these cultures. It appeared evident that streptococci and a diplococcus were widely distributed in poliomyelitis and at present they were regarded as secondary invaders growing in symbiosis with the true organism in a manner analogous to the growth of streptococci in persons suffering with scarlet fever.

Doctor EMERSON, closing the discussion, said that we had certain proved data upon this subject but were not yet ready to speak positively upon the matter. In New York on Barren Island with the

most insanitary conditions, of the 350 children there was not a single case of poliomyelitis. Under modern control we considered the school as our main point in the control of communicable diseases of children and not as a site of communication. Most exhaustive study of possible insect carriers showed that we could attach no suspicion to this theory. Every case discharged from our hospital was followed by the Committee on Aftercare so that each case would be under the care of a competent orthopedic surgeon usually in cooperation with a neurologist. The organization and supervision of this aftercare work had been made possible by the generosity of the Rockefeller Foundation.

Births, Marriages, and Deaths.

Married.

SMITH BRANDT.—In Los Angeles, Cal., on Thursday, January 24th, Dr. J. Marion Smith and Miss Inez Brandt, of Bloomington, Ill.

THOMAS-BARBOUR.—In Wollaston, Mass., on Sunday, January 20th, Dr. Harold Thomas, of Hartford, Conn., and Miss Gertrude Barbour.

Died.

ALLEN.—In Montrose, Colo., on Monday, January 7th, Dr. John Quincy Allen, aged sixty-three years.

BESMER.—In Ithaca, N. Y., on Friday, February 8th, Dr. Howard B. Besmer, aged forty-eight years.

CAMP.—In Chicago, Ill., on Tuesday, January 8th, Dr. Charles D. Camp, aged seventy-three years.

DAY.—In Danville, Va., on Friday, January 25th, Dr. William C. Day, aged seventy-seven years.

DODS.—In Valmora, N. M., on Wednesday, January 9th, Dr. George D. B. Dods, of Chicago, Ill., aged fifty-six years.

EVANS.—In Madison, Wis., on Monday, January 7th, Dr. John M. Evans, of Evansville, Wis., aged fifty-nine years.

FARR.—In Brookline, Mass., on Thursday, January 24th, Dr. Edwin L. Farr, aged seventy-three years.

FLYNN.—In Mount Holly, N. J., on Saturday, January 2d, Dr. John Joseph Flynn, aged fifty years.

GILES.—In Cold-Spring-on-Hudson, N. Y., on Saturday, January 19th, Dr. Richard Giles, aged fifty-seven years.

HARRIGAN.—In Brooklyn, N. Y., on Sunday, December 30th, Dr. John Harrigan.

HORN.—In Little Rock, Ark., on Friday, January 4th, Dr. A. E. Horn, of Hot Springs, aged seventy-seven years.

HUGHES.—In Kennett Square, Pa., on Wednesday, January 2d, Dr. Morris Hughes, aged sixty-four years.

JONES.—In Greenville, S. C., on Sunday, January 6th, Dr. Clinton C. Jones, aged fifty-eight years.

MILES.—In Merom, Ind., on Monday, January 7th, Dr. James Miles, aged fifty years.

NORTHBRIDGE.—In Brooklyn, N. Y., on Sunday, February 10th, Dr. Thomas Henry Northridge, aged sixty-seven years.

O'DONNELL.—In Baltimore, Md., on Wednesday, January 9th, Dr. Thomas Joseph O'Donnell, aged thirty-eight years.

POST.—In Maquoketa, Ia., on Saturday, January 12th, Dr. William Cranquet Post, aged sixty-eight years.

TOEPLITZ.—In New York, N. Y., on Sunday, January 13th, Dr. Max Toeplitz.

STERN.—In New York, N. Y., on Wednesday, January 30th, Dr. Heinrich Stern, aged fifty years.

WESTON.—In Laveria, Tex., on Tuesday, January 22d, Dr. John M. Weston, aged eighty-five years.

WHEDON.—In San Diego, Cal., on Friday, February 8th, Dr. Daniel Denison Whedon, aged twenty-eight years.

WRIGHT.—In New Lexington, Ohio, on Friday, January 25th, Dr. James H. Wright, aged fifty-nine years.

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THE DEMONS OF HERESY AND THE DEMONS OF DISEASE IN THE PROCESSES OF THOUGHT.

By JONATHAN WRIGHT, M. D.,
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The study of words and their usage frequently clears up, by collateral help, many vexing problems in the history of thought. There is a curious connotation to be made of the word "purge" in the English language which finds analogous affinities in other modern and in ancient tongues. In the English language we find the dictionaries tell us that the word is compounded of the Latin roots of *purus* and *agere* and purify of *purus* and *facere*, so that etymologically they are synonyms. It is well to keep this in mind since, elementary as it is, it points at once suggestively to a common origin in primitive concepts and we shall find this common source among the earliest and the most enduring theories of the etiology of disease; but much of interest is to be noted before we get back to that undifferentiated stage of the etiology of two now such disparate notions as those of heresy and disease.

We are easily reminded that "purge" frequently appears in expressions entirely remote in ordinary thought from any therapeutic affiliation. It can, however, scarcely fail to occur to any one, if he stops for even the most cursory analysis, that when a witness or a complainant in the courts is "purged of contempt," there must be some affiliation of meaning between the legal and the medical terms. Yet I am sure not one casual reader in a thousand could, on the spur of the moment, trace out why this resumption of due reverence for the judge and jury has anything to do with therapeutic purging. He may indeed pursue, in his thoughts, the idea to its political affiliation, when he recalls the famous "Pride's Purge" of the Long Parliament, which made it a Rump Parliament, and made Cromwell all but an absolute monarch in his protectorship of the realm of England, Scotland, and Ireland. If he ponders further he will see the puritanical joke, a pretty poor one on such a serious occasion, that made a play of the name of Colonel Pride who drove out of the House of Commons all but forty-odd of its orthodox members. It was "Pride's Purge." This may indeed be enough to remind one that it is but a step from reverence for the judge and for the constituted authorities for the temporal

control of men to the reverence due and exacted for the constituted spiritual authorities. The purge of pride and the purge of contempt thus take their places by the side of the purge of heresy. As I have said even a superficial analysis easily leads us thus far, but what these purges have to do with intestinal purges is not very clear though one cannot escape a vague sense of an affiliation which is satisfied for the time with the thought that the purges of pride, of contempt and of heresy are but a figurative fashion of speech which is illustrative rather than significant of some deeper and more interesting affiliation of thought.

It is not difficult to see that things of the spirit may, in a manner, thus form parallels with things of the body, but how could things spiritual and things corporeal—for that "there is a natural body and there is a spiritual body," we are well assured—ever have entered into the same mental category? How did purgatory and purgation thus become associated in thought? Clearly, as far as our language goes, purging means cleansing and purifying "by separating and carrying off whatever is impure, heterogeneous, foreign, or superfluous," and this we have seen is more or less a function of certain activities of the Law, the State, the Church and of the therapy of the body. The streets are purged by the rain water and our sins by holy water and our bowels by mineral water. "I'll purge and leave sack and live cleanly," Falstaff, in a flitting moment of moral enthusiasm, exclaims, and there can be no doubt Shakespeare meant to draw attention to the fact that the old rascal really needed purging by all the faculties, by law, medicine, and religion.

It is evident then even from a consideration of the current modern English speech and thought, that we may well have here an instance of a heterogeneity of conception springing from some original homogeneity of thought or belief, to put it in the sonorous English of the Spencerian philosophy of evolution. Such an inference would be strengthened by a reference to the idioms of other modern languages and by a study of the similar ideas for which they stand, but, though the instances of other English usage of the same thought are not far to seek, the inference, I think is quite obvious and it will be vastly more interesting to attempt to get a glimpse of the phenomenon in the current thought of our great progenitors who stand as giants at the gate-

ways of our mental evolution, where converge the roads that lead from primitive barbarism through the more ancient civilizations to our own. All modern thought has received its chief illumination from the Greeks and the semicivilized hordes of modern science which are issuing from our universities, ignorant of the fact or not heeding it, are doing sorry service to humanity in attempting to make it oblivious of that which most graces it and most tends to hide its intellectual brotherhood with the ox.

When we looked in our English dictionaries we saw that "purge" is a word arranged under two categories, one applicable to things terrestrial and one to things spiritual. So when we look in the Greek dictionaries we perceive that *katharsis* or *katharsios* has also two meanings, medically a purge and spiritually a purification and an expiatory cleansing from defilement and guilt. In the *Eumenides*, l. 578, *Æschylus* represents *Apollo*, who it is well to remember was the sire of *Æsculapius*, as the purifier of blood who by virtue of a *katharsis* is able thus to absolve the guilty and miserable matricide, *Orestes*, pursued by the *Furies* for his mother's death. *Apollo* testifies in the *Areopagus* for the suppliant at his altar. He shares, singular to say, in the trial and becomes jointly answerable for the killing of *Clytemnestra*. There are numerous instances of this readiness of the gods unequivocally to stand by those they protect. *Apollo* here thus becomes the voucher, the purger of blood guiltiness.

This was one aspect of the spiritual catharsis in the Greek mind. There was another ramification, more interesting to us, as it has affiliation with our understanding of the effect of music on mental disorders. *Aristotle* (1) recognized it fully and the cathartic function of music is thoroughly appreciated. *Aristotle* (2) and the tragedians who preceded him went further. They insisted that portrayal of tragedy, the representation of the suffering of others on the stage, and the exhibition of the causes or sequences of events which lead up to the sorrows and sins of men, have a soothing and beneficial effect on the minds of the spectators torn by their own troubles. It was declared to be the highest function of the tragic muse to accomplish this catharsis. For the most part the supreme agony of death was banished from the representation, but however emotional the course of the drama had been, the close of the representation was not a climax of horrors, but a yielding to the inexorable decrees of fate, the object being not to send the spectator away with lacerated feelings, but with feelings sobered and steadied to meet with calmness and courage his own trials and difficulties. In his *Poetics* (2) *Aristotle* insists that tragedy is an imitation of a worthy or illustrious and perfect action, unconcerned with trivialities, set forth in pleasing language and through pity and fear affecting a purification from the like passions in real experiences. The *Ajax* of *Sophocles*, the commentator takes note, thus brings about a purification or *katharsis* of anger and impiety. This is, in a way, homeopathic treatment and it perhaps can be likened to the principle the Spartans practised in showing to their sons drunken helots to excite their

disgust. Now in modern medicine we are familiar enough with the idea that music has a soothing effect upon certain manifestations of mental disease, as referred to by *Aristotle* under the term *katharsis*, but the thought of tragedy on the stage having the effect of purging our minds of evil passions is foreign to us, nor will it ever become familiar to us, unless by some unlikely chance our tragic muse reaches the heights where *Æschylus* and *Sophocles* dwelt.

It needs no such elevation of culture to make the idea of the effect of music on disease familiar to the thoughts of men. It is not only a device common to psychiatric therapy in civilized practice, but there are examples of this to be found in the medical practice of primitive men. The *Abbé Proyart* (3) speaking of the Congo 150 years ago says that the rich men were recommended by their doctors to try music for all sickness. "When they are called to a rich man they bring along with them all sorts of blowers upon instruments whom they can collect in the country. They enter into his house in silence, but at the first signal given the musical troop begins. Some are armed with cord instruments, others strike upon the trunks of hollow trees covered with skin, certain ones have trumpets, and others kinds of Basque tambourines. All unite their voices to the sound of the instruments, making around the bed of the patient a frightful din, which often is kept up for several days and nights continually."

Plato (4) approved of music as an ethical educator but he had not the high opinion of tragedy entertained by *Aristotle*, who joins the sense of *katharsis* in the medical and the divine (5). *Jowett* (6) translates the passage in the *Politics* to which I have referred as the "healing and purgation of the soul." *Jebb* (7), in his translation of the *Electra* of *Sophocles* and *Verrall* (8), in his translation of the *Choephoroi* of *Æschylus*, have notes which relate to the same subject and are of interest. *Plato*, not entirely in agreement in the *Republic* with the subsequent remark of his pupil *Aristotle*, in the *Sophist* uses the term *katharsis* in connection with the philosophical refutation of error, and the connection of the thought is unmistakable.

Stranger. For as the physician considers that the body will receive no benefit from taking food until the internal obstacles have been removed, so the instructor of the soul is conscious that his patient will receive no benefit from the applications of knowledge until he is refuted, and from refutation learns modesty; he must be purged of his prejudices and think that he knows only what he knows, and no more.

Theætetus. That is certainly the best and most temperate state.

Stranger. For all these reasons, *Theætetus*, we must admit that refutation is the greatest and chiefest of purifications, and he who has not been refuted, though he be the great King himself, is in the highest degree impure; he is uninstructed and deformed in these things in which he would be truly blessed ought to be pure and fair.

I have matched the Aristotelian idea of music with that of the potentates in Africa on the Congo and it is possible to instance a more specific example of the refutation of error among the *Kafirs* at the Cape to match the Platonic parallel. *Dudley Kidd* (9) says describing the natives in the Cape Colony:

"A Kafir woman was very indignant that her son had renounced heathenism and embraced Christianity. She promptly administered a strong emetic and purgative to dispel the hated religion." He seems to think the idea that emetics or purgatives can dispel false notions is world wide, but such an explicit example as he gives of it I think it must be quite rare nowadays in civilized lands.

In the *Iphigenia in Tauris* of Euripides we find (l. 1222-1233) the heroine exclaiming, as rendered in Way's translation (10):

Lo, and even now I see the strangers pacing forth the fane
With the adorning of the Goddess, with the lambs, that
by blood stain.

Blood stain I may cleanse,—with flash of torches, and with
what beside,

As I bade, the strangers and the Goddess shall be purified.
Now, I warn the city folk to shrink from this pollution far;
Ye that, with pure hands for heaven's service, temple
warders are,

Whoso purposeth espousals, whoso laboureth with child,
Flee ye; hence away, that none with this pollution be defiled.
Queen, O Child of Zeus and Leto, so the guilt from these
I lave,

So I sacrifice where meet is; stainless temple shalt thou
have.

Blest withal shall we be—more I say not, yet to Gods
who know

All, and, Goddess, unto thee, mine heart's desire I
plainly show.

I quote this passage not only to show the use of the word *katharsis* here translated as purification but to draw attention to its connection more specifically with blood atonement. We find in the reference to the ritual of blood stain washed away by blood stain of lambs a striking instance of the relics of homeopathic magic, which, as is well known by ethnologists, is a very common form of it among primitive men. This was another aspect of the religious catharsis in the Greek mind, the method of absolution from sin familiar to some of our own phylacteries. In the *Æschylus* play we noted that Apollo bore a share of the blood guilt in the purification of Orestes and here we see by the term *καθάρια* the goddess, Artemis, Apollo's twin, also bore some of the blood guilt. In the blood of lambs we get here again a lurking of primitive belief in that other prominent magical conception of the scapegoat, which among modern savage tribes is so often still loaded with the demons of disease and driven from the village or set afloat on the waters of some river of the wilderness or the seashore. However much the worshippers of classicism in ancient Greece would like to ignore it, there is more than one reference which can be culled from the literature and from archaeological records which points to the lingering of human sacrifice far into the time of Athenian glory. At any rate in primitive Attica the ancient goddess Brauron had been honored by human sacrifice (11). Human blood, not the blood of goats or lambs, was used to wash away the stains of human guilt. The introduction of the goats and lambs and the ram in the offering of Isaac by Abraham were the first gleams of pity in the dreary picture of savage ritual, but it was a faltering in primitive homeopathic doctrine.

This brings us to another interesting fact, the implication of another medical term in the maze of magical ideas that persisted far into the philosophic age

of Greece. In the Thargelia, one of the religious spring festivals of the Greeks, the *pharmakos* was the leading part. When we refer to the Greek lexicon we find as a definition for the verb *φαρμακεύω*, first that it signifies the administration of a drug, but second it is still as often found in classical Greek to signify the use of enchantment and the practice of sorcery and we note the link connecting it with drugs, the use of poison. Now Osthoff (12), with all his German diligence, has been unable to trace the word satisfactorily out of the Greek and we are compelled to accept a chthonic Greek origin both for *pharmakos* and for *katharsis*. Osthoff, however, says, in regard to the former, that in the time of Hipponax and even in that of Aristophanes and Demosthenes the *pharmakos* was a scapegoat in the rituals, an outcast in human shape bearing black magic away with him. Miss Harrison (13), despite these usages of the word in the Greeks, infers that it has other and more primitive connotations.

It is rather difficult to see why these learned authors have come to these conclusions for a word which is used in the earliest writings—in the *Iliad*, xi.514, and in the *Odyssey*, iv.226, with the ordinary meaning of a drug, though in some lines there is a rather wonderful efficiency to it. When the fair Helen mixes such a cocktail for Telemachus it elevates him considerably, but there is no suspicion of a scapegoat admixture attached to it. Five hundred years later the meaning set forth in the *Frogs*, l. 733, of Aristophanes to which these authors refer is probably Mediterranean magic coming to the surface again later after the intrusion of the Aryan from the north. To the two men, who represented the character of a scapegoat or *pharmakos*, was ascribed the function of purifying the city. They were doubtless put to death in earlier times and their blood thus purged the city of guilt and relieved it of sickness, yet the idea seems to have been to get rid of them but not necessarily by death. Among the ritual acts performed upon these men, one representing a scapegoat for the men and one for the women, was that they were struck and beaten with branches of buckthorn or *Rhamnus catharticus*, a plant still familiar to us as a purge, or with rods of *Agnus castus*, again a plant of cathartic action. Now another of the scourges used to drive out the vicarious agents of disease and sin, the atoners for guilt of all kinds, was one plaited of leek and onion tops.

And now we are carried over to Africa, for while with the Greeks and Romans the therapeutic value of onions as purges was small, with the Egyptians they were highly esteemed as such. The author of the Hippocratic treatise on *The Diet* recognizes the leek as an evacuant and a diuretic, producing so much purgation as to be bad for the eyes, but the onion on the contrary is good for them and he does not consider it a laxative. When we turn to Joachim's (14) translation of the Papyrus Ebers, however, we find that a very large majority of the prescriptions for the purpose include onions, though to be sure there is some doubt as to the proper rendering of the words by the translator. There are some substances to be given to drive witchcraft out of the body, including aloes,

juniper berries, raw honey, natron (Col. xxxiv, lxxxviii). In sufficient quantity the physiological action of these things would doubtless be purgative, yet, while often apparently inert material is recommended for specific purposes, there is an onion prescription manifestly with a therapeutic potentiality used to drive the "witchcraft" out of the body of man or woman. A number of prescriptions are also recommended for this, for the most part containing drugs of unknown value but with some extended and particular directions for the pharmacist in mixing and preparing them and for the patient in taking them, especially on going to bed and we may conjecture they, like the aloes, etc., above were also laxatives given to drive the "witchcraft" out of the body. This seems to have been essentially the South African idea we noted at the Cape. The eructation of gas and doubtless also the passing of flatus per anum were accepted as the outward manifestations of the inward activities of some troublesome disease spirit or demon.

The space at my disposal and the meagreness of records of Babylonian therapy prevent me from citing from them the evidence of the trail of this thought of primitive man which would doubtless be easy of accomplishment had we a companion book of Mesopotamian *materia medica* for the invaluable one Ebers found in Egypt. Sufficient, however, has been shown to make it evident that the peccant humors of the intestinal canal were ascribed to an indiscriminate horde of demons within the human body which accounted also for a witchcraft in Egypt which finds its parallel in Holy Writ in the story of the Gadarene swine.

In connection with the subject I have dwelt on an instance of that marvel of the ages, the expansion of the human intellect in Greece in the fifth century before our era. I have only aimed to cite enough from the Greek classics to illustrate it, but even that little has carried me beyond what was strictly necessary for a demonstration of the paths of this particular evolution of thought. It is easily seen how completely the clues to the trails in the labyrinth of the human mind are often lost. Here it happened that the idea of savage man that devils are at work inside of him and cause his ills was so firmly fixed throughout countless ages before civilization dawned on the Nile or the Euphrates, that it not only left its trace in the Zulu woman in our day but it left its unmistakable imprint on the earliest medical book we possess. With the help of this evidence it is not difficult to trace its persistence in the conventional talk of millions of modern human beings in civilized life. The leek and the onion plaited whip has its affiliation with flagellations for sin and with surgical cauterization and blistering for the relief of pain in modern medicine and many other things had their origin in the intention of the primitive medicine man to make the body an uncomfortable dwelling for evil spirits. At a time of the year when the country people used to tell me it was the proper season to purify my blood with sassafras tea, a matter which also has its interest in connection with the ancient festivals, in the springtime, I see people coming from church with palm leaves in their hands. Paton (15) refers to a Greek custom of today of people

coming out of church and beating each other with palm branches. He is disposed to connect the original ceremony with capricification, or the ceremony of the fertilization of the fig tree in Asia Minor. The two goats grazing on trees in the illustrations to be seen in Ohnefalsch-Richter's work (16) in their representation on ancient vases point, as do the details of the ceremony to which Paton alludes, plainly to the scapegoat idea of the *pharmakoi* though in a different way than Miss Harrison apparently had in mind. The basket on which the figures appear was found in the tomb of Egyptian Rameses III, 1204 B. C.

The thought is familiar to us of the substitution of the ram for Isaac in Abraham's projected sacrifice. We have noted human blood washed away with lamb's blood in Euripides's play. A like substitution evidently occurred in the ritual to which it refers centuries before Euripides wrote. In the ritual of the onion and leek top whip at the Thargelia there is substitution less familiar to our thought. It is evidently of two kinds. There is driving out from the city substituted for what was evidently originally sacrifice of the human scapegoat of disease and sin—the *pharmakoi*. In the ceremony there is use of onion tops in the flagellation also substituted for the medical catharsis possible in use of the bulbs. Manifestly then there is a unison in the ceremony of two different primitive therapeutic ideas one homeopathic—blood cleansed by blood—and the other a demon driven out by catharsis. The modern instance of flagellation with palm branches in Greece, noted by Paton, is evidently a simple transference of a ritual of a similar form, perhaps of similar origin, from the old to the new religion.

What have these two things, heresy and disease, to do with one another? What have the operations of the mind to do with operations of the bowels? There seems only one answer to these questions. The analysis of this particular example of the unity of things corporeal and things spiritual must convince us that the unison of the concepts really existed only at their origin, and that they have no more to do with one another today or in the time of later Greek culture than metaphysics and the price of meat. The initial letters only of metaphysics and meat are the same. Yet through all the countless ages these things we have been considering have been glued together in the currents of our thought and are inextricably interwoven still today with the mazes of our common speech. The savage, when he conceived of a demon interfering in the intestinal processes and in the processes of the spirit, leading to queer actions, opened a channel in the human mind along which thought has flowed ever since in a fashion which, on analysis, seems the height of absurdity.

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PERICHOLECYSTIC ADHESIONS DYSPEPSIA AND ITS DIAGNOSIS.*

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Inflammatory processes of the gallbladder or its adjacent structures may lead to the formation of adhesions. Adhesions between the gallbladder and the duodenum, or the gallbladder and the pyloric end of the stomach, or all three occur most frequently. At operation these adhesions may show varying degrees of thickness and density and may form strong bands. An accompanying cholecystitis, with or without stones, is usually also observed in which the mucosa, submucosa, and muscularis of the removed gallbladder show a mild degree of inflammation or no inflammation at all, but numerous adhesions; or the reverse may be noted, namely, an advanced cholecystitis with few adhesions. Occasionally a gallbladder may be found full of stones, but thin as tissue paper and without any adhesions whatsoever. Since cholelithiasis may be diagnosed only in certain cases by palpation, as when the gallbladder is distended by a large stone, and since adhesions around the gallbladder cannot be palpated except in rare instances where they form the so called adhesion tumors, the diagnosis is often limited to cholecystitis. However, with the aid of roöntgenoscopy and roöntgenography, it has recently become possible to diagnose pericholecystic adhesions as well as gallstones. The object of this paper is to deal with a group of patients commonly classed as dyspeptics who have been treated for indigestion for long periods until an exploratory laparotomy reveals the presence of pericholecystic adhesions, with or without an accompanying cholecystitis.

While gallstones and cholecystitis are more frequently found in the female than in the male, cases of pericholecystic adhesions are about equally distributed among both the sexes. Clinically, several groups of patients suffering from pericholecystic adhesions may be differentiated: 1. From patients belonging to the biliary colic group a typical history of gallstone colic is elicited, but for jaundice, which is absent from the past or present history, the symptoms as a whole correspond strikingly to those described in textbooks. At operation pericholecystic adhesions alone may be detected. On many oc-

casions I have seen such patients permanently cured by the mere separation of the adhesions and in a few instances where in addition the surgeon removed the gallbladder, the latter was pronounced normal by the pathologist. 2. The symptoms of patients belonging to the atypical group are vague and indefinite. Slight attacks of pain in the epigastric region dependent upon or independent of meals are the chief complaints. One may interpret such cases as atypical biliary colic or even chronic peptic ulcer. At operation nothing but pericholecystic adhesions may be found. 3. In the peptic ulcer group a typical history of gastric or duodenal ulcer is elicited from the patient. The stools may give a positive guaiac test or occasionally hematemesis may be one of the complaints. Ulcer therapy is of no avail. Operation reveals the presence of pericholecystic adhesions and not of ulcer. However, it must be admitted, that occasionally evidence will be obtained from the history and findings pointing to the presence of chronic ulcer; and such being diagnosed before operation an ulcer will be found, but in addition pericholecystic adhesions are present. 4. The appendicular group includes patients in whom appendicectomy was performed because the patient complained of pain in the lower right quadrant of the abdomen and because tenderness was detected

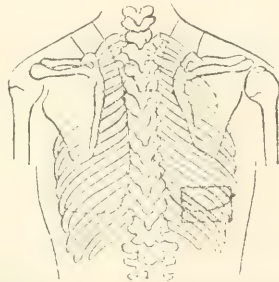


FIG.—Tender spots or pressure points in diagnosis of pericholecystic adhesions.

in the appendicular region. The pathologist, however, could not find signs of appendicitis in the sections of the appendix. Weeks or months after the operation, the patient presents the same symptoms of which he previously complained. A second operation does not reveal the supposed postoperative adhesions in the region of the appendix, but pericholecystic adhesions which were not diagnosed before the first operation. I have repeatedly seen such patients remain well after separation of the adhesions around the gallbladder, with or without drainage. The simultaneous occurrence of appendicitis and pericholecystic adhesions may be mentioned here. 5. Among the unusual conditions which are found in patients suffering from pericholecystic adhesions are: the hourglass stomach; obstruction of the small or large intestines; adhesions of the gallbladder to the serous coat of the appendix; pyloric obstruction. 6. Finally, while in the previously enumerated clinical groups of cases arising from pericholecystic adhesions, pain is the presenting symptom, in the last group of cases, the dyspeptic group, pain is entirely absent. Even on repeated

*Read before the Harlem Medical Association, November 7, 1917.

cross examination of the patients, pain is at no time reported from their histories.

There are two types of dyspeptics in this group: 1, dyspeptics without nervous symptoms and, 2, dyspeptics with numerous nervous symptoms. The chief complaints of the patients included in the first type are attacks of vomiting; sensation of burning or of stone or load in the stomach; sour eructations; flatulence; constipation and constipation alternating with diarrhea; undigested food particles in the stools; loss of flesh; general weakness. There may be a fair combination of these complaints. In rarer cases one may speak of monosymptomatic dyspepsia since there is only one presenting symptom: eructations, epigastric distress, burning in the stomach, vomiting, flatulence or sensation of weight or load in the stomach. The physical examination is entirely negative in regard to local tenderness. Gastric secretions may be normal, hypoacid, hyperacid, anacid, or achylic. Gastric motility is frequently normal or various degrees of atony or hypermotility may be detected. Stiller's habitus is present in some; in others, especially in those over forty years of age, obesity is observed. With the second type of dyspeptics the complaints are practically the same, but with the addition of numerous nervous symptoms, as excitable or depressed mental state, salivation or dryness in the mouth, a dry cough, probably reflex cough, heart palpitation, especially during the attacks of gases, changes in cutaneous circulation, as cold hands, cold feet, or both, disturbed sleep or insomnia. The signs are: absent or exaggerated gag reflex; occasional anesthesia of the cornea; narrow or wide palpebral fissure; narrow or wide pupils; various degrees of protrusion of the bulbi or a tendency to enophthalmos; dermatographism with mostly the red, occasionally the white line; exaggerated knee jerks.

Whether one calls these patients neurotic, vegetoniacs, or sympathicotonicacs or whether one believes they present some disturbance of the equilibrium of the vegetative nervous system or of the endocrine glands, the fact remains, as demonstrated at operation, that a number of them are afflicted with pericholecystic adhesions. Since the patients in both of the dyspeptic types do not complain of pain, the organic element is overlooked in the majority of the cases. The patients go for a long time to the family physician, then to the consulting internist and neurologist, and finally they reach the surgeon, who, as Doctor Deaver would have put it, believes in the aseptic knife, and through the operation the true nature of the dyspepsia is discovered.

For the last ten years I have paid much attention to the so called pericholecystic adhesions dyspepsia and I have reached the conclusion that in dyspeptics this diagnosis can be made easily even in the absence of the presenting symptom, pain. There are two important diagnostic aids: 1, the presence of tender spots or pressure points to the right of the spinal column posteriorly, and, 2, x ray evidence. Although Boas was the first to describe these pressure points in gallstone colic, they never were utilized in the diagnosis of obscure cases, especially in dyspeptics. These spots are found to

the right of the spinal column posteriorly in a small area between the seventh and eleventh ribs (see Fig.) On deep pressure the patient reacts with pain. One must not confuse the deep pressure pain with pain resulting from superficial pressure due to hyperesthesia of the skin and one should compare the tenderness elicited in such manner with the corresponding areas on the left side. If upon repeated examinations the findings are constant, then they possess diagnostic value. One must not, however, expect to find the pressure spots localized at all points within the described area. There may be but one spot in the continuation of the scapular line, or axillary line or posterior median line. These pressure points are pathognomonic for pericholecystic adhesions, with or without a cholecystitis. The deep pressure points cannot be elicited from dyspeptics free from pericholecystitis.

Since I have learned to appreciate the value of these pressure points, my pitfalls in the diagnosis of pericholecystitis or cholecystitis have become nil. Furthermore, I was able to diagnose pericholecystitis as a concomitant disease. The history of a patient and all the clinical and laboratory findings may point to a gastric or a duodenal ulcer, but the dorsal pressure points being present, pericholecystitis will be correctly diagnosed; and this will be subsequently verified at operation, with both conditions, ulcer and adhesions, being found. The same holds good for appendicitis and cholecystitis.

I do not claim to have discovered something new, but merely call attention to an important sign which has previously never been utilized in the diagnosis of obscure cases of pericholecystitis. One should make it an invariable rule, therefore, to search for the tender spots in every dyspeptic, in clear cases of gastric or chronic peptic ulcer, and in appendicitis. This may bring out an additional organic condition, which is not of simple academic interest, for some may dispute the question of surgery in all cases of chronic peptic ulcer, but no one will deny that cholecystitis and pericholecystitis require surgical interference. The pain experienced by the patient on deep pressure within dorsal areas may be due to the fact that the same inflammation which produced the cholecystitis and pericholecystitis affects the small areas of intercostal nerves. A mild neuritis in localized areas develops. This mild inflammation, however, is not sufficient to cause spontaneous pain, but quite enough to cause pain when deep pressure is being exerted. The second important diagnostic aid is obtained by means of the x rays. This demonstrates the high position of the stomach, the pylorus drawn to the right, and a residue six or eight hours after administering the contrast meal. One may be certain that if the x rays were used as a routine in the so called dyspeptics, pericholecystic adhesions would be frequently discovered. In this group with the two diagnostic aids I mentioned, the diagnosis is not difficult. However, I would consider demonstration of the pressure points superior to the findings of the x ray, as on many occasions, especially where there was ptosis of the stomach, I obtained operative evidence of cholecystitis and adhesions, while x rays were negative and pressure points were present.

I shall mention briefly minor symptoms and signs which may suggest the presence of cholecystitis in dyspeptics: occasionally a sensation of itching all over the body or in localized areas; frequently a bile reaction or a urobilin reaction in the urine; sometimes albuminuria and a few casts in the urine, secondary to cholecystitis, mild glycosuria, transitory or permanent—secondary pancreatitis—pus in the stools; a nondigestive leucocytosis which is difficult to interpret and which is repeatedly found in dyspeptics, and last but not least, the study of the duodenal contents.

In conclusion, I should mention the importance of demonstrating in x ray plates the outline of an enlarged gallbladder as direct evidence for cholecystitis and as indirect proof for pericholecystic adhesions and the presence of true, but not suspicious gallstone shadows in the plates.

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SUBCONJUNCTIVAL INJECTIONS.

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Subconjunctival injections do not seem to have been placed upon as firm a therapeutic basis as the clinical results justify. Experimentation and discussion, pro and con, have not yet settled the specific action of the various substances that are used in subconjunctival injections.

Three different views are held today concerning the action of subconjunctival injections: direct specific action of the injected substance on the eye (Darier); acceleration of the lymph current in the eye (Mellinger); and hyperemia caused by the irritation (Wessely). Jones (1), who has given a large number of injections, says: "I have no theory which satisfactorily explains the curative power of these injections in the wide range of conditions to which they are applicable. In inflammatory troubles they are antiphlogistic; in indolent conditions they increase circulatory activities; in septic troubles they check sepsis and, where sepsis is impending, prevent it." This was very noticeable in the author's Case VI, the cut having been made by a dirty fish knife.

Hertel studied the subject experimentally and clinically. In his experiments he made subconjunctival injections of salt solutions into one eye of each rabbit, ascertained the decline of the freezing point of the aqueous of injected and intact eyes, and calculated the osmotic concentration. His experimentation confirms somewhat the views of Wrissel. Hertel reached the following conclusions: In diseases of the fundus, not bacillary, as far as amenable to the instituted treatment, the number of improved cases was increased by the introduction of subconjunctival injections of salt solutions. The degree of improvement measured by the visual acuity was not raised compared with the preceding treatment.

Wessely's investigations (2) relative to the fate of the subconjunctival injections shows that hypertonic and hypotonic salt solutions after variable periods of time are converted into isotonic solutions. The sodium chloride enters the bloodvessels by diffusion and osmosis, the lymph vessels not participat-

ing in the absorption of crystalloid substances. Highly concentrated solutions of salt are absorbed more slowly due to the irritated condition of the conjunctival vessels. The albuminous contents of the anterior chamber are increased as a result of the proportionate increase of the strength of the solution and its reflex irritation on the ciliary body. The rapidity of the fluid currents is not influenced. Salt injections also cause marked increase of amboceptors and alexins in the anterior chamber.

One should always remember, however, that these experiments were conducted on animals' eyes and that clinical results are often obtained in the human individual that we are unable to prove experimentally. We find, however, Darier (3), Dufour (4), Senn (5), and Dranoux (6) lauding injections and disregarding other forms of treatment of corneal ulcer. Abadie (7) believes they are good in inflammation of the cornea and adjacent parts, but does not believe they are of any use in diseases of the eye ground. Hansell (8) used subconjunctival injections in purulent infections of the cornea, traumatic and spontaneous, and although he has had no bad effects, he says that the remedy does not recommend itself to him. No reasons are given. So far, in the literature on this subject, only one accident has been recorded; others may have happened, but have not been reported. De Schweinitz (9) reports a case of glaucoma following subconjunctival injections of cyanide of mercury in a patient twenty-six years old twenty minutes after the injection. A salt solution had been used previously on the same case without any untoward effect.

Between 1907 and 1913 there was a dearth of literature dealing with subconjunctival injections. During 1913 subconjunctival injections of salt solutions were used by Mallwitz (10), who believes that subconjunctival injections of salt stimulate metabolism and absorption. He cites twenty-eight cases, of which twenty-two showed disease of the macula, eighteen vitreous opacities, and eleven marked conus formation. In twenty-one cases this method of treatment resulted in distinct visual improvement; in five no change occurred; and in one vision became slightly worse.

One would judge that Darier (11) either was not perfectly satisfied with subconjunctival injections of cyanide or desired to improve upon their action, for in 1913 he removed serum from blisters artificially formed and injected subconjunctivally for abscess of the cornea with hypopyon which responded in three days. One case of parenchymatous keratitis cleared up. He found antidiphtheritic serum fully as efficacious and believes subconjunctival injections are the effective agent. The serum was obtained by bleeding the patient, centrifuging, and drawing off the fluid. Favorable action is due to the formation of special vaccine, probably specific to the patient's infection. In 1914 Dr. John Green, Jr., (12) reported a case of keratitis disciformis. This case had had several weeks' treatment previously with silver nitrate, argyrol, hot irrigations, and dionin with no result. Saline solution was given subconjunctivally with prompt improvement. Verhoeff (13), relating his experience in the treatment of corneal ulcer, dismisses the subconjunctival injections with the

statement that he has found other methods so effective that it seemed unnecessary to give the painful method a trial. Certainly there is no more pain in the subconjunctival injection, properly placed and



FIG. 1.—Showing condition of lens prior to injection, Case III. Entire clearing of striæ. No improvement in the tubercular fundus.

with the solution the right strength, than one would find in any other ordinary form of treatment used for corneal ulcer.

Necrosis is said to follow injections of cyanide and oxycyanide, but I have given twenty-seven injections in seven cases and necrosis has not been evident. The swelling following some of the injections has lasted for a period of four weeks. Obliteration of the conjunctival sac takes place, but after several months there is no evidence of any adhesions. The most gratifying results one can see in the use of subconjunctival injections are in the cases of corneal ulceration. After watching the ulcer for several days and seeing it progress regardless of the treatments, one is astounded at the quick results following a subconjunctival injection of cyanide of mercury 1:2,500 combined with dinion,



FIG. 2.—To illustrate Case IV. Fundi cannot be seen. Pupillary exudate. A, iridectomy.

0.125 grain. This was very evident in Case V seen recently. Various local treatments were used without having any apparent effect, the ulcer continuing to light up and spread. One single injection of cyanide of mercury and dinion sufficed to stop the spreading of the ulcer. I have not had any results in chorioiditis, whether central or peripheral, unless the case is one with a positive Wassermann and Noguchi. In these cases, continuing with internal treatment, the results are beyond expectations.

CASE I.—Ulcer of the cornea, traumatic, left. Male; married; age thirty-six years; painter. July 26, 1916: Pupil was small and contracted. Fluorescence stain outlined the ulcer. Local treatment for two days was of no avail. On the twenty-eighth, the ulcer was curetted and cyanide of mercury and dinion were injected. July 31, 1916, it was entirely healed. Vision, left eye, 6/6.

CASE II.—Iridocyclitis. Female; single; age fifty-one years. July 16, 1916. The patient presented a history of being blind in the right eye from iritis for twenty years. There were many adhesions. Intermittent pain for three months and a sensation as of floating bodies were complained of. Vision, right eye, fingers, one foot; left eye, 6/60. Pupil: one millimetre in diameter. There were many adhesions

and much plastic exudate. The fundus could not be seen. The left eye was injected with dinion, atropine, and cyanide of mercury with a reaction and the pupil was larger on the next day. July 25, 1916: Vision, left eye, 6/30, and several letters on 6/20 line. July 27th: Right eye was injected. August 5th: Left eye was injected. August 14th: Vision, left eye, 6/20. On the same day I gave another injection in the left eye and repeated on the 18th. August 30th: Vision, left eye, 6/15. This patient was last seen on March 23, 1917, when the vision was 6/15 plus in the left eye.

CASE III.—Incipient cataract, double; right eye, tuberculous of the choroid and retina; floating bodies in vitreous. Female; married; age seventy-six years. July 16, 1915, the patient complained of failing sight since spring, following the gripe. Vision, right eye, fingers, four feet; left eye, 6/30 plus 1. Injection of cyanide of mercury and dinion was prescribed. On July 25th, August 3d, and 8th, injections of cyanide of mercury and dinion were given. Vision, right eye, fingers, five feet. March

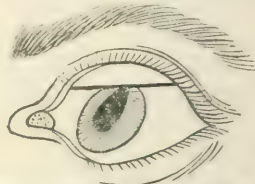


FIG. 3.—Wound in sclerocorneal margin, Case VI. Vitreous and ciliary processes bulging. Textbooks advise immediate enucleation.

17, 1916, vision, left eye, 12/200. There was no effect upon the tuberculous condition. The lens striæ entirely disappeared, but the tuberculous condition progressed until it involved the left eye. All kinds of tuberculin were used and only in the past three months has the patient's temperature been normal. September 29, 1917: Vision, right eye, 2/15; left eye, 2/12. Patient gained four pounds. Vitreous still had floating bodies. Subconjunctival injections in this case undoubtedly failed for the tuberculous condition, but clearing of the lens opacities was complete.

CASE IV.—Iridocyclitis. Female; married; age twenty-seven years. This patient complained of photophobia in both eyes with poor vision. Vision, right eye, 6/60; left, 1/60. The patient had had an Elliott operation on the left iris and had been under treatment for two years without any improvement of vision. No improvement followed the iridectomy. She was wearing plus 12, which did not improve her vision; the lenses were apparently given for the psychical effect. Fundi were not visible. The Wassermann and Noguchi reactions were both negative. March 2, 1916: Injection of dinion and cyanide of mercury in the right eye was given. March 24th: Injection of dinion and cyanide of mercury in the left eye was given. March 27th: Injection of dinion and cyanide of mercury in the right

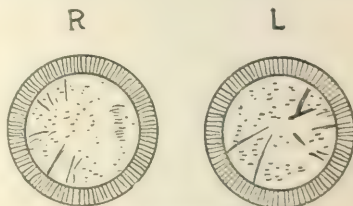


FIG. 4.—To illustrate Case VII.

eye was given. April 24th: The patient said she had been able to read the newspaper for the first time. On May 5th vision in the right eye was 6/15 plus 3, and in the left eye was 6/30. Injection was given in the right eye. May 31st: Vision, right eye, 6/12. July 6th: Injection in the left eye was given. There was an unusually large amount of swelling. July 17th, seeing double, continued until the 27th. August 7th: Vision, right eye, 6/15; left, 6/12. Injection was given this day in right eye. August 24th: Vision, right, 6/12 plus; left, 6/12 plus. This patient was not seen

again until October 2d; no treatment in interim. Vision, right eye, 6/10 plus; left, 6/12. At my request she called again on April 2, 1917, and the vision was, right eye, 6/15 plus; left, 6/10 plus. This patient had been under treatment for three years with a gradual diminution of vision and had resigned herself to going blind. She had consulted twelve oculists of reputation who failed to offer her any help. She returned at my request on October 8, 1917, for the visual acuity. Right eye, 6/12 plus 1; left, 6/10 plus 1; both eyes together, 6/7. There has been improvement in the left eye, maintained vision in the right eye, and with both eyes the vision is practically normal. No treatment in the interim, one year.

CASE V.—*Corneal ulcer.* Male; single; age twenty-nine years. This man reported on May 25, 1917, that he had had gripe which settled in his right eye. Other members of the family had had chickenpox. He thought possibly the eye trouble came from this. Vision, right eye, 6/60. The accepted various forms of local treatment were followed for eight days, the ulceration spreading. June 25th: Injection of mercury cyanide, dinion, and atropine, one c. c. was given. On July 9th, healing was complete. August 4th: Vision, right eye, 6/10.

CASE VI.—*Sclerocorneal puncture, vitreous and ciliary processes prolapsed.* Male; single; age thirty years. Patient presented himself for treatment on June 23, 1916. He had been struck in the left eye by the back of a knife while chopping off fish heads. This cut extended through the ciliary process and bulged through the cornea sclera wound, as in Fig. 3. Vision, left eye, light perception only, lower half. This case was one in which, according to the routine treatment, immediate enucleation would have been the proper procedure. A conjunctival flap was made covering the wound and a twenty minims injection of cyanide of mercury with dinion and atropine was given subconjunctivally. On August 3d, healing was complete and I found ophthalmoscopically a detached retina, outer and upper quadrant. This man went to Alaska and was not seen again until August 14, 1917, when the vision was, right, 6/10; left, 6/30 plus. He now has a useful eye, that I would not have hesitated to enucleate had the teachings of our textbooks been followed.

CASE VII.—*Incipient cataract, right and left.* Female; married; age thirty-nine years. November 16, 1916, vision had been failing between seven and eight years in both eyes. Vision, right eye, 6/30; left, 6/30 minus 1. This woman had been to oculists of note throughout the country as far east as Boston who did not offer her any hope of benefiting her vision. She was treated intermittently by means of diet, protein elimination, cyanide of mercury and dinion injections in the left eye only. Massive doses were given locally in the right eye, with the result that on March 23, 1917, vision, right eye, 6/15 plus 2; left, 6/15. She is now able to read Jag. 2 fluently twelve to twenty lines. The patient has informed me that she will return some time this fall for further injections.

It should be noted that in all of the cases described above the hemoglobin, blood pressure and complete uranalysis with percentage of urea nitrogen, nonprotein nitrogen, creatinin, and uric acid were taken in order to arrive at the proper course to follow. Where any of the above departed from the normal, appropriate treatment was instituted. Patients who showed abnormal weight compared with the height and age were given an appropriate diet. The same held good if there was retention of the protein metabolism.

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202 SECURITIES BUILDING.

A CASE OF MENINGITIS CAUSED BY BACILLUS INFLUENZÆ.

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Writing in the *British Medical Journal*, Ross and Moore (1) preface their report on influenzal meningitis by the following remark: "While it would be incorrect to describe influenzal meningitis as a rarity, at the same time instances of this affection are sufficiently uncommon to deserve being placed on record from their clinical, therapeutical, and bacteriological interest." Although cases have been reported since 1913 (2), the following case seems to the writer to present some points of interest both clinically and bacteriologically.

CASE.—J. F. T., a boy, four years of age, had been a healthy baby, except that he was prone to attacks of "indigestion." These attacks would come on every few weeks without assignable cause; he would vomit everything he ate for a day or more, would have some fever, and would be constipated. After withholding food and effecting a movement of the bowels, usually by enemata, the attack would subside. His tonsils had been large since infancy. Four months before the present attack whooping cough had developed. He had never entirely ceased to cough, though there had been no increase in the cough or any sign of a "cold" or condition that could be termed influenza in the days preceding the acute onset. [It should be noted that the patient of Ross and Moore had had whooping cough a month before the onset of the meningitis.]

On October 28, 1917, the boy appeared perfectly well in the morning. At noon he vomited, and expressed a desire to lie down. The vomiting was repeated several times during the afternoon; the vomitus consisted of food at first and later of bile stained mucus. The writer was called in to see the child in the evening. At this time the child's temperature was 104° F.; pulse, 120. His mental condition was clear, and he did not act very sick. The parents said that he was acting just as he always did in his "stomach attacks." The usual treatment for an acute gastric upset was begun. October 29th. In the morning the temperature was still 104° F. and the patient was still mentally alert. He had vomited once during the night; his bowels had moved freely after an enema. The mother was sure that the child was just as he had been in other attacks. At this time it seemed to the writer that flexion of the neck was not quite free, but the child complained of no pain in the neck, only of an indefinite headache. There was no Kernig or Babinski sign. The examination for these signs was made because of a suspicion of poliomyelitis. October 30th. The mother thought that the child was better, as he had slept better. Temperature was 102° F., but the mentality was clouded. It was noticed that the child would cry out about every fifteen minutes. The neck was distinctly stiff; there was no strabismus or nystagmus; knee jerks were present. Dr. LeGrand Kerr was called in consultation. His examination revealed the above signs; he found the lungs absolutely negative, and both Babinski's sign and Kernig's sign well marked. The tonsils were enlarged and somewhat red; there was a well marked tache cérébrale. He pronounced the case one of cerebrospinal meningitis, in all likelihood due to the meningococcus, and he advised lumbar puncture with withdrawal of fluid and injection of the Flexner antimeningococcus serum. This was done promptly by Dr. Esmonde B. Smith. About twenty c. c. of slightly turbid fluid escaped under moderately increased tension.

Quoting from Doctor Smith's notes: "By request of Doctor Hills and Doctor Kerr, twenty c. c. of antimeningitis serum was run in by gravity at the same sitting to save time on the basis of a probable meningococcus infection. Examination of the fluid gave a cell count of fifty per cubic millimetre, chiefly lymphocytes, and abundant globulin. The turbidity was not due as much as expected to the cell content, which was low for the usual meningitis, as to the presence of enormous numbers of Gram negative bacilli of varying size from small coccoid forms to long threadlike types. As the fluid had been obtained under strict aseptic

fluid was examined within a few minutes of withdrawal, contamination could be ruled out. The appearance of the smears was so extraordinary that I submitted them to Doctor Flexner as one far more capable than myself to diagnose a rare infection. His report of *Bacillus influenzae* infection was confirmed later by culture on blood plates. In a personal communication, Doctor Flexner stated to me that *Bacilli influenzae* growing in spinal fluid are apt to develop the long forms which, on artificial cultivation, revert to the standard form."

October 31st. The child was worse, more somnolent, with slight divergent strabismus, more rigidity, and distinct retraction of head. In view of the pathological findings, Doctor Kerr, who saw the child again, advised the use of antinfluenzal serum. Lumbar puncture at 1 p. m. by Doctor Smith resulted in twenty c. c. of fluid, all that would flow freely. The fluid was more turbid and slightly hemorrhagic. The cell count was rising but could not be determined accurately owing to the presence of blood. Enormous numbers of the same bacilli as in the first fluid were found. At 8 p. m. Doctor Smith, having received from Doctor Wollstein, of the Rockefeller Institute, a diagnosis of influenza meningitis and a supply of antinfluenzal serum, withdrew eighteen c. c. of spinal fluid and allowed twenty c. c. of the serum to run in by gravity. November 1st. The child was in coma, with marked divergent strabismus and intense rigidity. At 8 p. m. Doctor Smith withdrew twenty c. c. of the spinal fluid, which was very turbid, slightly hemorrhagic, cell count high, chiefly polymorphonuclears, with numbers of the same bacilli; the tension was only moderate. Twenty c. c. of antinfluenzal serum was administered. November 2d. The child grew steadily worse and died at 5 p. m. There were several short convulsions near the end.

We were fortunate in securing the help of Doctor Flexner and the staff of the Rockefeller Institute for Medical Research. The following is the report sent to me from the Rockefeller Institute:

October 30, 1917. Specimen of cerebrospinal fluid, about five c. c., was very slightly turbid. It had been centrifuged and showed a small precipitate slightly blood tinged. This fluid had been incubated over night before reaching here, and films from it were unsatisfactory. Two films from the fresh fluid accompanied the specimen, and these showed many polymorphonuclear leucocytes, some red blood cells and Gram negative, pleomorphic bacilli, with very little phagocytosis. Because the film from the incubated fluid showed curved, diptheroid bacilli, no positive bacteriological diagnosis was made. In the light of the later examinations, this specimen must have been contaminated when received.

October 31st. About fifteen c. c. of the blood stained cerebrospinal fluid contained a small coagulum of fibrin and pus. Films from this showed large numbers of polymorphonuclear leucocytes, red blood cells, and many Gram negative bacilli. The bacilli varied in size, the longer forms predominating, and were practically all extracellular. A tentative diagnosis of influenza meningitis was made and the injection of antinfluenzal immune serum advised. Cultures on blood agar and on sheep serum agar were made.

November 1st. Blood agar plate cultures showed a growth of influenza bacilli and a contaminating white staphylococcus. The influenza bacilli were characteristically pleomorphic, varying from coccoid forms to long threads; polar staining was present. Sheep serum agar cultures gave no growth. November 2d. Twenty c. c. of yellowish, turbid fluid with some blood corpuscles received. The specimen was more turbid than the previous specimens received. Films showed polymorphonuclear cells and very large numbers of Gram negative bacilli with somewhat increased phagocytosis. Cultures on blood agar gave a pure growth of *Bacillus influenzae*. The second generation of the fluid from October 31st was inoculated intraperitoneally into a white mouse and intravenously into a rabbit weighing 900 grams. The mouse died in less than twenty-four hours and the rabbit in thirty-six hours. The bacilli were recovered from the heart's blood.

(Signed) MARTHA WOLLSTEIN.

The outstanding clinical feature of the case is the rapid development of the meningitis without an

clearly definable primary infection. Those interested in this report are referred to the article by Ross and Moore, containing references to the literature up to 1913. From the standpoint of treatment, reference should be made to an interesting article by Dr. Martha Wollstein (3).

The writer acknowledges with thanks the assistance of Dr. LeGrand Kerr, Dr. Simon Flexner, Dr. Esmonde B. Smith, and Dr. Martha Wollstein.

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HYDATID PYOPNEUMOCYST OF THE LIVER.*

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The study of hydatid cysts is full of interest. This disease is preeminently Argentine, as verruca, the disease of carrion, is Peruvian; leprosy of today, Norwegian; cholera, Indian; and yellow fever, Brazilian. It is so widely spread in Argentina that we dispute the first place with Iceland, the classical ground of the echinococcus, and with Australia which, possessing, as we do, extensive plains and large numbers of cattle and dogs, is one of the countries more frequented by this parasite. The hydatid cyst was investigated here by the French explorer Creveaux (1) who studied it in the cattle, and in 1870 Dr. J. J. Montes de Oca (2) performed the first operation in the case of a man whose illness was correctly diagnosed as hydatid cyst by Doctor Rawson who happened to be present. From that time this disease has gone on steadily increasing in this country until in 1901, I had collated, in conjunction with Professor Cranwell (3), 970 cases comprising those registered in the hospitals and private sanatoriums of Buenos Aires. Since then we have been able to increase our statistics, as has been recorded in various publications and at medical congresses. As regards my own personal observations, my records registered up to 1910 a total of 105 cases of hydatid cysts with various localizations, and this experience has enabled me to form my own opinion upon the course and treatment of these parasitic cysts.

Without entering upon a zoological study of this curious parasite and its means of entry into the human system, it will be enough to remember that once it has obtained an entry into the digestive ducts, it reaches its preferential seat of localization in certain organs and tissues by way of the blood-vessels. The liver is the principal viscus visited by this unbidden guest as it finds here a kind of blood lake which offers the conditions favorable to its development. If it is carried past the liver it finds a similar blood lake in the lung, which statistics prove

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is the second, in order of frequency, of the organs attacked.

The cyst may remain without alteration for many years until it dies or undergoes different changes, some of which have not as yet been fully studied. Regarding these changes or degenerations, Stirling (4), of Melbourne, has given the best description, classifying them in four principal stages: 1. The turbid stage is caused by the death of the parasite, the liquid being rendered turbid by precipitation of the albumin. If daughter cysts are present their contents remain clear. 2. In the fatty stage the precipitated proteins are changed into fatty substances and the liquid becomes more turbid, finally assuming a butterlike consistency. The mother cyst acquires a gelatinous or gummy aspect and by shrinkage in size is thrown into folds. The daughter cysts also shrink and their contents first become turbid, finally undergoing a degeneration similar to that of the mother cyst. 3. In the stage of desiccation the liquid disappears, leaving a putty-like mass in which can be seen stearin, cholesterol, and, less frequently, Charcot's crystals. 4. In the stage of calcareous infiltration the entire cyst is sometimes transformed into a thick, hard mass, which if it has been previously operated on prevents it from closing. Caride (5) gives us a

suppurate. This suppuration may simply fill the cyst or it may be accompanied by the production of gases. It is on account of this curious spontaneous transformation of the liquid that Devé (6) has called them *kystes gazeux du foie* and Enebuske (7) *kystes sonores du foie*. Adnet (8), inspired by Devé, has devoted a deep study to this complication. He classifies these gaseous cysts in four groups: 1, gaseous hydatid hepatic cysts ruptured into the bronchus; 2, gaseous hydatid hepatic cysts ruptured into digestive ducts; 3, gaseous hydatid hepatic cysts opened by operation; 4, gaseous hydatid hepatic cysts closed, which have never communicated with any hollow viscus or with the exterior. This latter constitutes the primitive gaseous hepatic cyst and the three former the secondary gaseous hepatic cyst.

It is only since the end of the early part of the last century that these primitive cysts have been studied, Kunde (9), of Berlin, being the first to observe such a case in 1837, where a cyst had ruptured into the bronchus. In 1856 Dolbeaux's case (10) of this complication following upon a series of punctures is worth noting. Gilbert and Weil (11) in 1898 read a paper before the Société de Biologie de Paris giving us the first bacteriological study of this complication, in which they insisted on the importance of *Bacillus coli*, proposing the name of pyopneumohydatid. Among other important works I may mention Lipmann's bacteriological study (12) communicated to the Société de biologie de Paris in 1902, Enebuske's thesis in 1906, and a remarkable work by Devé (6). My bibliography is very incomplete and I can only make a few references here. We owe our first study of these primitive cysts to Professor Ayerza (13) who in 1910 gave a detailed lecture to the students in his ward at the Clinical Hospital upon a case in which he had operated. The second work was a communication by Dr. G. Valdez Junior (14) to the Sociedad médica Argentina. Dr. Juan J. Spangenberg (15) has given us a third in a very complete account of the case of a patient twenty years old, in Dr. R. A. Nolting's ward of the Ramos Mejia Hospital.

The object of this lecture, however, is not the study of these spontaneous suppurations, which have already been dealt with fully by others: my aim here is to present the practical knowledge and experience that I have been able to gain from four personal observations of pyopneumocysts, (16) the first of which was the case of a boy with this complication following upon an hydatid cyst of the convex face of the liver treated by the Australian method in 1905. It is unnecessary to enter into the technical details of the operation for hydatid cysts, but I must remind you that there are two principal methods practised today. The first and older consists in draining the cavity after evacuating the liquid and removing the mother membrane: it is called marsupialization and was originated in France, being perfected later in Germany, thanks to the progress which the art of surgery had made. Australia produced the second method as recently as 1883 and Knowsley Thornton (17) was the first to put it into practice. Bond (18), Poulton (19), Barnett (20), Hamilton Russell (21), and

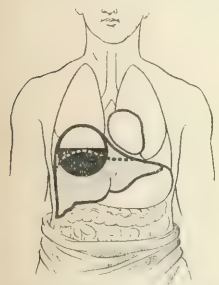


FIG. 1.—Pyopneumocyst of the convex face of the liver (right lobe), the patient in standing position.

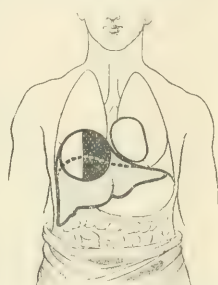


FIG. 2.—Pyopneumocyst of the convex face of the liver (right lobe), the patient lying on his left side.

good example in a case, where, after operating for hydatid cyst of the liver, a fistula appeared which persisted for many months. He reoperated and removed the pericystic membrane which had been transformed into a thick, hard, calcareous covering, exactly like the shell of a "mulita" (Tatu hybridus, Desin). Stirling also quotes an interesting case in the Adelaide Hospital where it was necessary to use a saw to open a splenic hydatid cyst, to such an extent had the osseous transformation developed. At the same time that these degenerations of the cyst occur, the liquid which it contains may also undergo changes. Sometimes it assumes a dark red or a greenish tinge, due to the presence of bilirubin which contains crystals, first studied by Bristowe in 1853. Further there have been cases in which a papillomatous growth invades the cavity, projecting from the inner walls of the cyst. In other cases the mother cyst has disappeared and yet the daughter cysts have been exceedingly numerous, in one case 28,000 being counted. Last of all the cyst may

Stirling (22) adopted it in Australia as the elective treatment for clean cysts and Posadas (23) has familiarized it here. It consists in extracting the mother membrane, leaving the sac, after occlusion, in the abdomen. At first, in a time when peritoneal infections were feared, marsupialization was used in every case, but little by little its application has diminished on account of the inconveniences which followed, bile discharges, suppurations, fistulas, etc. Today its use is limited to cases of suppurating cysts and those having either a bile discharge, numerous daughter cysts or degenerated, rigid walls. The Australian method ought only to be employed in those cases where the cyst contains clear transparent liquid. In forty-six cases treated by the Australian method I have only had three deaths; one from bronchopneumonia, another following upon Pott's disease, and the third from a suppurating cyst which caused death by peritonitis in a case which presented multiple cysts of the liver. Posadas also used it in cases where the contents were slightly bile tinged. In my opinion, considering the bile origin of cystic infection, this is dangerous.

One of the complications that may occur in an occluded cyst is the reproduction of the liquid and development of gases within, a phenomenon which I was the first to observe in my case (18), that of a boy who entered my ward on February 3, 1905. His history is as follows:

CASE I.—B. G., a boy, eleven years old, Argentine, from Loheria, in the Province of Buenos Aires. Hydatid cyst of the liver was diagnosed; he entered hospital February 3, 1905. Seven years ago he suffered from lack of appetite which coincided with strong intermittent pain in the right hypochondrium. The belly was soft, somewhat distended, but not excessively painful on palpation. Five years ago a small tumor was observed immediately under the ninth rib on the mammillary line that increased in size and was at times painful. The patient was submitted to home remedies throughout his illness, but the development of the tumor was in no way modified. Examination showed a well developed boy with scanty adipose tissue; respiration hurried; belly enormously distended; lower costal arches bulged outward, narrowing the base of the thorax. There was a well defined vaulted swelling of the right half of the thorax and of the right side of the abdomen. Palpation revealed a hard smooth rounded tumor occupying the right hypochondrium, the epigastrium, and part of the left hypochondrium, and having respiratory mobility. Throughout the tumor percussion gave dullness which merged into the liver dullness with a feeling similar to the sensation which percussion of a mass of gelatin would give. The lower border of the right lobe of the liver was sharp and irregular and descended to the margin of the iliac fossa; the upper border reached the third rib, bulging out the costal arches; upon deep respiration this border descended about one centimetre. The skin over this region was tense and shiny and contained some clearly seen engorged veins. Nothing abnormal was seen in the respiratory organs; the heart was displaced to the left and its beats were felt outside the mammillary line.

February 16th. A superumbilical median laparotomy was done. An enormous tumor was reached occupying the whole of the right lobe and pushing the diaphragm in a pronounced convexity upward. The lower border of the liver nearly reaching the right iliac fossa was regular with granular surface. The cyst was incised and a large quantity of fertile liquid, clear, colorless, and transparent, was drawn off. The mother membrane was removed and the cavity dried. The cyst was closed, the wall sutured in two layers, and Mitchell's agraffes were used for the skin. February 22d. Mitchell's agraffes were removed. Healing was by first intention. Since the operation there was no fever and general condition was good. March 15th. Dress-

ings were removed; wound was perfectly cicatrized; liver returned to normal position; no sign of tenderness in the region operated. April 20th. Examination revealed vaulted swelling of right hypochondrium, the scar being distended and raised. April 25th. Marked dyspnea and night sweats were noted; temperature, 30° C. (102.2° F.). On palpation the heart was felt very much displaced to the left. The general condition was worse; the swelling of the hypochondrium had increased. A radioscopic examination showed the right diaphragm pushed up with a clear zone beneath; below this was a dark shadow bounded above by a horizontal line which changed in accordance with changes of the patient's position, as was seen in cases of pleural effusions. April 26th. The cyst was again opened through the first wound, a large quantity of fetid gases and purulent liquid escaping; ample drainage was left. April 28th. There was an abundant bile discharge, soaking the dressings. May 3d. In spite of various treatments to which the cavity had been submitted, the bile discharge continued abundantly. July 2d. The bile discharge still continued; general condition was visibly worse; there was excessive dyspnea with fever and night sweats. Examination revealed dullness on the left side of the thorax, faintness of the vesicular sounds, bronchophony, and egophony. There was increase of cardiac dullness; the heart tones were very weak. In view of this bad condition a puncture was made, giving exit to a purulent liquid. August 1st. In spite of two further punctures, the patient grew worse; fever and night sweats continued. In this state of progressive exhaustion some bronchopneumonic foci appeared which caused death on August 11th.

Post mortem examination revealed bronchopneumonia of right lung; pulmonary atelectasis; fibrinous purulent pleurisy of the left side; fibrinous purulent pericarditis; myocarditis; fatty degeneration of the heart. Adhering to the diaphragm was an operated cyst of the liver, about the size of an orange, communicating by a sinus with the exterior.

In the same year, 1905, I published the statistics of my ward and in dealing with the cases of hydatid cysts of the liver I wrote as follows: "In a case recently operated in the ward by the Australian method and which seemed to be going on well, we submitted the patient to an x ray examination and on the screen we could see perfectly clearly that the cyst was filled with liquid which moved when the patient was shaken; also the radiograph showed the diaphragm pushed upward on the side of the cyst, the right side, and a large dark zone bounded by a horizontal line, as is seen in pleural effusions. We believe this to be the true criterion to know whether a cyst, operated by the Australian method, is cured or not." In the following year, December, 1906, Cerné and Devé (24), of Rouen, published a very complete article on this complication, in which they dealt with a similar case. In 1909 Legueu (25) presented a case before the Société de Chirurgie de Paris. It was in this year that I observed my second case, a girl of fourteen years, and in April of the following year, 1910, I again had this complication to deal with in my third case, a boy of fourteen years, who came from Tres Arroyos in the province of Buenos Aires. Here we have the histories of these two cases.

CASE II.—A. S. M., a girl, fourteen years old, from the Salto Oriental, Uruguay. Hydatid cyst of the liver diagnosed; entered hospital February 28, 1904. Four or five months previously she had suffered from pains in the region of the right hypochondrium radiating toward the right shoulder, which gradually increased in intensity and later were accompanied by a marked swelling at the site of the pain. She stated that she had not had any disturbance of the digestive organs, urticaria, or jaundice. Examination showed a well developed and nourished girl; right hypochondrium and epigastrium swollen and the lower costal spaces enlarged; no distended veins were ap-

parent. Respiratory movements clearly defined extent of the swelling. Palpation showed that the liver was enlarged and had descended; the lower border, which on the mammillary line was situated on the horizontal line passing through the umbilicus, was easily perceived by touch; it was of normal consistency with respiratory mobility and was not enlarged. There was no particular tenderness and only upon strong pressure did the patient acknowledge pain. Percussion in the region occupied by the tumor gave complete dullness extending in a convexity upward with its extreme limit in the third intercostal space; on the axillary line this dullness reached to the fifth rib, descending on the scapular line to the horizontal line which passed through the tenth spinous apophysis. The lower limit coincided with the position of the lower border of the liver already described and is two fingers' breadth over the umbilicus at the epigastrium. The upper limit was modified by deep respiration. There is no hyatid fremitus nor the Fiaschini-Santi boom. Percussion and auscultation of the thorax and palpation and percussion of the spleen revealed nothing abnormal. Blood examination: 5,410,000 red cells; 14,400 white cells; sixty-five per cent. hemoglobin; leucocyte count: polynuclear leucocytes, 74.66 per cent.; eosinophilic cells, 2.66 per cent.; lymphocytes, 19.66 per cent., etc. Nothing of note in the urine; reaction of antihydatid bodies positive. Radioscopic examination revealed the diaphragm bulged convexly upward, reaching nearly to the third rib; this convex line was greatly accentuated by respiration.

March 1st. A superumbilical median laparotomy was done. The cyst was punctured with a trocar and with Potain's apparatus. One and one half litres of clear greenish liquid were drawn off, Quenu's system of formolage being practised. The cyst was immediately incised and the mother membrane removed. The liquid, slightly bile stained, did not interfere with the complete closure of the cavity, since it was kept dry by wiping during the suture. The wall was closed in two layers and the cyst attached to the peritoneum. March 2d. Temperature normal; pulse, 100; tongue, moist; general condition, good. March 3d. No change. March 4th. Temperature rose to 39° C. (102.2° F.) and pulse to 120; tongue furred; pain in the epigastrium; slight frontal headache. The dressings were removed; wound was in perfect condition. An enema was given, lowering temperature to 38° C. (100.4° F.). March 5th and 6th. The temperature was about 38° C.; pulse, 100 to 120; the epigastric pain had disappeared, and the headache had only come on very slightly at night. Saline purgative was given on the 6th. March 7th. Patient woke feeling perfectly well; temperature and tongue normal; pulse, 90. March 8th. Temperature and pulse were normal; the stitches were removed; healing was by first intention. There was no tenderness in the region operated in spite of pressure exerted to discover pain. March 20th. Condition continued very good; nothing abnormal in the hepatic region. March 22d. Patient left the hospital at her own request. April 2d. She presented herself again in a state of dyspnea with temperature 38.7° C. (101.6° F.) and pulse 130; general condition bad; cyanosis and epigastric pain. The belly was swollen, especially in the epigastric region, the scar of the recent operation being slightly distended. The lower right thoracic region was raised and the skin tense and shiny. Palpation was easy, especially in the lower half of the abdomen. Percussion gave tympanic sonority throughout the swollen part; the lower intercostal spaces on the right were distended and painful; there was no elasticity. In a sitting position percussion gave an outline of absolute dullness merging into that of the hepatic region, its upper limit reaching the edge of the fourth rib; above this there was tympanism, entirely different to the pulmonary sonority which was observed throughout the swollen region when in dorsal decubency. The changing of the patient's position caused intense dyspnea and marked cyanosis. The heart was pushed upward and displaced to the left; its tones were normal; examination of the lungs revealed nothing of importance. There were amphoric and metallic sounds and a hyprocystic sound that could be heard at some distance; there was slight ictericia and a small quantity of bile pigment in the urine. Blood examination: 4,000,000 red cells; 10,000 white cells; fifty per cent. hemoglobin. Leucocyte count: polynuclear leucocytes, seventy-two per cent.; transitionals, four per cent.; lymphocytes, nineteen per cent., etc. Under the x rays a dark shadow was

seen reaching to the fourth rib, the upper limit of the hepatic dullness on the mammillary line, topped by a horizontal line above which appeared a clear, cupola shaped zone, more transparent than the normal lung, which was pushed upward by the bulged diaphragm. Whatever the patient's position, the liquid remained in the lower part with the clear zone always above it. This examination again produced intense dyspnea and marked cyanosis.

April 2d. The patient was placed on the table in a sitting position and a puncture made with a trocar in the dull zone, a little to the right of the old wound, only a small quantity of fetid gases and a few drops of liquid coming away. A syncope ensuing made it necessary to lay the patient flat, and therefore it was deemed advisable to make an incision through the former wound, an enormous quantity of purulent liquid and fetid gases smelling like sulphuretted hydrogen being evacuated. The opening was widened to allow of the complete emptying of the cavity and a glass drainage tube was left. The patient was brought round by injections of ether, camphorated oil, etc.; but in spite of this her general condition was not satisfactory. April 3d. After a few hours' sleep the patient was able to speak a little and began to recover from the state of stupor into which she had fallen; by nightfall she was completely restored and her condition normal. April 5th. The great quantity of liquid draining off necessitated two treatments daily; general condition improved. April 10th. Treatment only once a day. May 28. The wound was completely healed; general condition good. June 28. Limits of hepatic region were again normal; no pain on palpation or percussion. X rays revealed the limits of the diaphragm normal with respiratory mobility. She left the hospital at her own request. Examined a month later, she was found to be in perfect health generally and had gained in weight since leaving the hospital.

CASE III.—C. L., a boy, fourteen years, from Tres Arroyos, in the province of Buenos Aires. Hyatid cyst of the liver diagnosed; entered hospital April 4, 1910. Upon entry he complained of intermittent pain in the right hypochondrium, radiating toward the right shoulder; general condition good; natural functions normal. Examination showed a large swelling of the right hypochondrium, epigastrium, and left hypochondrium; skin tense, with distinct engorged veins. Palpation revealed a smooth rounded tumor continuous with the liver, the lower edge of which on the left mammillary line was two fingers' breadth below the costal margin. A compression, dividing the tumor into two unequal parts at the suspensory ligament, was clearly noticeable; pressure on one part raised the other. This huge tumor had respiratory mobility. There was a dull note on percussion which merged into the hepatic dullness and extended upward on the mammillary line, reaching the upper edge of the fourth rib. On the anterior axillary line it extended to the fifth rib, and on the scapular line to the angle of the omoplate. The lower border of the tumor, as palpation showed, was two fingers' breadth below the costal margin on the anterior axillary line and four on the mammillary line. On the median line the extraordinarily wide gap, whose vertex was two fingers' breadth from the xiphoid appendix, was at once noticed. On the left side following the edge of the gap the tumor extended to the zone of splenic and cardiac dullness, into which it merged. There was no hyatid fremitus. Percussion on the anterior face of the tumor was transmitted in waves to the posterior face. Neither percussion nor deep palpation was painful. Blood examination: Red cells, 4,560,000; white cells, 9,800; hemoglobin, sixty per cent.; polynuclear leucocytes, sixty-four per cent.; eosinophilic cells, 5.66 per cent.; lymphocytes, 22.66 per cent.; transitionals, 7.66 per cent. Urine examination showed nothing abnormal; reaction of antihydatid bodies was positive. Under the x rays the diaphragm was seen to be pushed upward in a pronounced convexity, moving freely with respiration, especially on the right side.

April 4th. A superumbilical median incision eight centimetres long was made; the peritoneum was opened and a tumor, strangulated by the suspensory ligament, was found. The left angle of the colon was adherent to the corresponding part of the tumor. A puncture was made with the trocar and two litres of clear, slightly lemon colored liquid was drawn off. Quenu's formolage was employed and the cyst immediately incised, an enormous mother membrane being removed. The cavity was dried and the

cyst sutured and fixed to the parietal peritoneum. April 6th. Favorable results; temperature and pulse normal. April 10th, Mitchell's aggraffes removed, the wound being perfectly healed; hepatic region appeared to be quite normal, giving grounds for assuming a definite cure. April 16th. Temperature and pulse normal; slight pain in the epigastric region. An examination revealed a swelling of the epigastrium and right hypochondrium, percussion giving a slight tympanic sound but no pain; condition of the wound was perfect. April 18th. Temperature was normal; swelling increased, with pain radiating to the right shoulder; no dyspnea nor displacement of heart, the apex beat being in the normal position. In dorsal decubency the swollen zone had a slightly tympanic note on percussion; in a sitting position there was dullness extending to a horizontal line passing through the xiphoid appendix and above this line tympanism extending to the fourth right intercostal space. The relation between the dull and tympanic sounds changed with the different positions. There was distinct hypocratic, amphoric, and metallic sounds. Urine examination revealed nothing important. The x rays showed a dark shadow topped with a horizontal line over which was a clear cupola shaped zone into which the liquid splashed when the patient was shaken. This clear zone altered according to the patient's position. The diaphragm moved up and down but less, apparently, on the right side. April 18th. Puncture and aspiration with Potain's apparatus were done, the patient being in a sitting position; 800 c. c. of frothy, odorless, mahogany colored liquid; albumin, 32 per mille; urea, 3.78; phosphates, 0.80; chlorides, 2.85; no microorganisms were present, but in spite of this cultures were taken.

April 19th. Temperature and pulse normal; general condition good. April 20th. The edges of the tumor remained at the limits to which they were reduced by the incision. Temperature and pulse were normal. The cultures gave: aerobics, staphylococci, and coli; anaerobics, coli, communis, and streptococci. April 30th. Examination revealed the upper border of the liver reaching the fourth intercostal space and the lower border slightly descended; palpation was painless and confirmed the limits shown by percussion of the lower border, which was slightly thickened. Under x rays the diaphragmatic cupola was seen at its normal height, although a small clear zone was visible between the muscle and the liver. The patient left the hospital at his own request.

In this year, 1910, I lectured before the Sociedad Médica Argentina in the extraordinary session held in honor of the foreign delegates on the occasion of the first centenary of our independence and on August 27th in this same year, I gave a further lecture on this subject at the session of the Academia de Medicina. Later on in the year I published, in conjunction with Doctor Jorge, (27) a study of this complication based on our three personal observations, giving it the name of pyopneumocyst of the liver. In 1912 an article by Chauffard and Ronneaux (29) appeared and in the same year Cerné (30) published articles supporting Devé's ideas. In April of this year Banzet (31) communicated a similar article to La Société Médicale des Hôpitaux. I might also note here the interesting theses of Lanes (32) of Bordeaux and Chaisemartin (33), of Paris. In April 1913 Devé (34) published an article and finally we have my fourth and recent observation. The history of this case is as follows:

CASE IV.—V. A. boy, Argentine, 11 years old, from Villa Soldati, Province of Salta. Hydatid cyst of liver and lung were diagnosed. The patient entered the hospital September 28, 1915. Birth was normal; at three days of age he had ophthalmia, which was cured in a month. He took the breast until three months old, and was then given sterilized milk. At this period he had diarrhea for eight days. When three years of age he had measles with an intense cough. He had good health until a year ago, when he was seized with shivering fits, high fever, sweats, and dry cough. Quinine was prescribed. This may have been

malaria, which is endemic in the Province of Salta, where he lives. These fever attacks recurred monthly until five months ago, when they ceased. About four weeks ago he again suffered with this dry cough, with which there were now occasional expectorations slightly tinged with blood. One day while playing he coughed up a membrane like cooked white of egg. Ten days ago he had another attack of coughing, with abundant expectorations in which were membranes, pus, and some blood; all this continued on his entry in hospital. When in the ward a second vomit was observed in which he threw up before our eyes a great quantity of pus, membranes, and blood. Upon examination a deformation of the thorax was observed, confined to the base of the right half and clearly defined in front. Only rales were heard on auscultation of the right side and upper part of the lung at the back. Palpation in front only revealed a rhoncus; there was continual cough. A tumor the size of an orange with respiratory mobility was observed in the epigastrium and right hypochondrium, which region it had deformed. Liver dullness increased; the lower border descended to four fingers' breadth below the costal margin on the mammillary line, being half way between the xiphoid appendix and the umbilicus on the median line; the tumor was elastic and uninterruptedly continuous with the liver. Under x rays a rounded tumor was seen in the vertex of the left lung and another at the base of the right lung.

October 5th. Patient was going on well; cough and expectoration diminished; no physical signs in the lungs. October 21st. There was no cough nor expectoration. A radiograph showed a round shadow on the left side and a diffused shade on the right; a clearly defined cyst was seen in the upper lobe of the left lung. The less clearly marked shadow in the right lung probably corresponded to a ruptured cyst. November 13th. There was hemoptysis; no fever nor physical signs; he was kept in bed and calcium chloride given. February 4, 1916. Fever and cough had recurred; the cyst of the liver had increased in size and was more prominent. A blood examination was thought advisable, but the parents refused consent. April 4th. Swelling was still more prominent; the x rays revealed the same conditions as before.

May 5th. Under local anesthesia a right paracostal incision beginning at the costal margin and extending eight centimetres down was made. The exterior rectus sheath was incised and the muscle pulled inward and the posterior layer of the rectus sheath and the parietal peritoneum were cut through and the peritoneal cavity opened. The cyst was reached and punctured and 500 grams of clear, fertile liquid without daughter cysts were drawn off. The cyst was dried, a little liquid, slightly bile tinged, flowing out, and closed without drainage; the wall was sutured. Postoperative: Everything perfectly normal. May 12th. Region operated upon was somewhat swollen. On examination percussion gave sonority in the prominent part of the tumor and dullness in the other parts; these notes varied with the changes of the patient's position. Under the x rays liquid was seen in the lower part topped by a horizontal line above which was a clear zone pushing the diaphragm upward. The patient was taken to the theatre, where a puncture was made and with Potain's apparatus 300 grams of dirty, mahogany colored liquid was drawn off. May 15th. The region was again swollen; x rays revealed the same conditions as before. Two stitches were removed from the wound and a fresh puncture gave exit to a dirty, bad smelling, mahogany colored liquid, thicker than previously. A few drops of chloroform were administered and a bistury was inserted in the puncture and the cavity incised; an abundant discharge of thick, bad smelling, mahogany colored liquid, containing pieces of membrane, followed. A drainage tube was inserted. May 17th. Bile discharge was so great that the sheets of the bed were soaked through; a drainage tube was left in place. May 18th. Bile discharge was less; tricalcine was given twice a day. June 6th. The effusion and bad smell persisted in spite of intracystic lavages with formal, oxygenated water, and Dakin's liquid. A draught of quinine, kola, and gentian was given. June 11th. The drainage tube was removed and a gauze pad inserted. When this was removed on the following day fifty grams of bad smelling pus were discharged. Antiseptic lavage with formal was done; a glass drainage tube was inserted. There was no fever nor cough; general condition was good. July 3d. The glass drainage tube was left in place;

necrotic tissues were discharged; quantity of pus had lessened. General condition was good. July 25th. The drainage tube was removed. July 30th. Patient discharged, cured.

As you see from these four histories, this complication is presented in the same form with slight variations. We have to deal with patients affected with hydatid cyst of the liver treated by the Australian method, who after a fortnight, a month, or even longer return with the belly again swollen. Sometimes there is slight pain but no fever; at other times there are dyspnea, fever, and grave general symptoms. These symptoms correspond roughly to the two forms described by Devé (34) as hydropneumocysts and pyopneumocysts. The first has been aptly summed up by this writer in three words; it is an "intrahepatic, hydroaeric effusion, clinically not septic." In the second form we run the entire scale, from the clear, bacterially aseptic effusion to the true purulent, septic, or putrid liquid. In both forms percussion gives tympanic sonority in the zone of the swelling surrounded by the hepatic dullness in dorsal decumbency. The intercostal spaces are more or less dilated according to the importance of the pyopneumonic effusion. The tympanic zone varies with changes of the patient's position but it is always sharply limited below by a line that remains horizontal. In my second case there was slight jaundice, marked cyanosis, and dyspnea which increased when the patient's position was changed. There was also hypocratic succussion distinctly audible to the doctors and assistants standing around; auscultation revealed amphoric and metallic sounds.

Radioscopic examination shows a subdiaphragmatic, intrahepatic clear zone which moves with changes of the patient's position, and below it a dark zone topped by a horizontal line, which also moves in accordance with the patient's position. (Figs. 1 and 2.) When you shake the patient in front of the screen you can see little waves that make distinct, dark splashes against the walls of the cavity above; they are strikingly prominent in the clear zone. I saw this most distinctly in my second and third cases. The heart is displaced to the left to an extent which depends upon the importance of the pyopneumonic effusion. Chauffard (35) adds to these symptoms the *poulsse endohepatique* which consists of the little undulations of the liquid, seen when the patient is told to hold his breath and which are due to the contractions of the heart, the movements being transmitted through the liquid.

The functional symptoms of the first form are not very important: heaviness, tension, dull pain in the hepatic region, slight dyspnea, digestive disturbances, and sometimes slight fever. Devé (34) describes the functional symptoms of the second form as an hepatic, peritoneal, or pleural reaction. These symptoms consist of local pain, marked digestive disturbances, slight jaundice, nausea, cough, dyspnea, etc. There are also the general phenomena of fever, sweats, paleness, emaciation, etc. The incision of the cavity gives exit to pus and more or less fetid gases. I noted all these symptoms in my first and second cases. The liquid, as well as the gases, aspirated by puncture is variable in appearance and

quality. It may be odorless, dark mahogany colored, and containing grumes, such as I observed in my third case; it may be completely purulent, with fetid gases, as in my first case; or again it may have that characteristic smell of sulphuretted hydrogen which it possessed in my second case. On rare occasions the liquid is blood stained and dark brown in color, or of a reddish color containing an important proportion of blood as in Banzet's case (31). A cyst treated by marsupialization also presents the curious phenomenon of intracystic pneumotosis, but its clinical interest is naturally less. This complication is generally present in all cysts having calcified or rigid walls.

Now let us consider how the infection of the cystic sac is produced. Some writers, among whom is Devé, believe that the infection is produced by the atmospheric air which enters the cyst by respiration—intracystic respiration—especially in those cases of a cyst of the convex face of the liver adhering to the diaphragm, as in my first case. I am of opinion that this belief is exaggerated since experiments prove that the air is reabsorbed within a certain time, giving up its oxygen and taking up nitrogen and carbonic acid which are expelled from the sac. Furthermore, I have operated upon many cysts of the liver and only on four occasions have I seen the curious phenomenon of cystic pyopneumotosis, and it is perfectly logical to suppose that in every case the atmospheric air had entered the sac by respiration. It was thought formerly that the bile was antiseptic and microbicidal, but research, particularly the work of Gilbert and Lippmann, has proved that even in its normal state the bile contains both aerobic and anaerobic germs, and therefore a bile discharge may easily be the cause of intracystic infection. Doctor Jorge and myself (26) are convinced that the infection arises chiefly from an anaerobic fermentation produced by an infection of the walls of the cyst, a belief which Devé admits only in a limited number of cases.

There are various producing agents of these infections. Gilbert and Weil (11) in 1898 gave great importance to the colon bacillus and Barth and Rist (36) in 1901 to *Bacillus fragilis* and *Staphylococcus parvulus*. Gilbert and Lippmann in 1902, and Lippmann (12) in 1904, described three strictly anaerobic microbes, calling them *Bacillus nebulosus*, *Streptococcus tenuis*, and *Staphylococcus parvulus*. The bacteriological examination of the mahogany colored liquid aspirated in my third case gave aerobic bacilli, the *staphylococcus* and *Bacillus coli*, and anaerobic, *Bacillus coli communis* and the *streptococcus*. Devé (34) in his article of April, 1913, which I have previously mentioned, claimed priority in the study of this complication in hydatid cysts of the liver treated by the Australian method, and without wishing to enter into polemics that lead us nowhere, since it is for others to judge the facts, I should like to mention that in Chaisemartin's thesis, inspired by Professor Chauffard, in Escudero's famous work (38) upon hydatid cysts of the lung, and in Lanes's thesis (32), inspired by Professor Chavannaz, of Bordeaux, I was credited with priority in this study. Now

Devé, referring in his article to the report which I published in 1905, actually wrote: "When we refer to the observation in question we see that it is only in a marginal note of nine lines," etc., and further on he adds: "Indeed, Vegas pointed out in the note I have referred to that the radioscopic examination of the patient operated upon," and he copies the note, but omits to quote the end of my note where I wrote: "We believe that this is the criterion to know whether a cyst operated by the Australian method is cured or not," in order to use it as his own expression in the course of his article. My concluding words can well be called the synthesis of my case, which offers a real solution to those doubts which assailed Doctor Oliver (39), of Montevideo, who at one of our medical congresses asked why, in cases of cyst operated by the Australian method, the cavity was sometimes again distended a month or two after and filled with liquid, rendering a second operation necessary. Devé also says that I have paid little attention to the gases and too much to the liquid. If this be so I have done well, since I agree with Professor Chaffard that the liquid is much more important and can be a source of danger and complications for the patient, as by a slight infection or by a septicemic or angiocolic *poussée* this serosity can be infected, since the reabsorption of the oxygen of the gaseous medium and its replacement by carbonic oxide put it in condition of anaerobic life. He further criticizes the name proposed by us of pyopneumocyst and wishes to change it to pneumocyst, thus attributing great importance to the gaseous element and comparing its development in the cyst to what occurs in pneumothorax. He says that pneumothorax is described in books with its anatomoclinic forms called hydrohemithorax and pyopneumothorax and as pneumotosis predominates in pneumocysts, therefore the name of pneumocyst must be the equivalent of pneumothorax, and its anatomoclinic forms will be called hydro-pneumocyst, hemopneumocyst, and pyopneumocyst. But we know, as Devé himself admits, that there is no such thing as a pure pneumocyst: there is always a certain quantity of liquid. It is in consideration of the fact that the liquid of the pneumocyst is more or less septic that I have chosen, in collaboration with Doctor Jorge, the name of pyopneumocyst, which seems to me to be preferable to that of *hydropneumocyste*, later modified by Chaffard and Ronneaux (29) to *hydropneumokyste*.

The diagnosis of these postoperative pyopneumocysts is usually easy; you have only to remember the symptoms which I have described and on no account to forget what I stated, long before Devé, in 1905 that to know if a cyst treated by the Australian method is cured or not, you must have recourse to the x rays, a method which gives, practically, mathematical security. The prognosis of these pyopneumo effusions, if left to themselves, is generally unfavorable except in those lucky cases when the pus or septic liquid, making its way through the abdominal wall, reaches the exterior by a sinus which as a rule heals rapidly. Usually the patient falls into a rapid decline, he becomes cachectic and is exposed to the danger of rupture of the sac with its attendant serious con-

sequences. Generally the liquid contents of the cyst are only slightly septic, but there are cases of suppuration, or of septic bile discharges accompanied by septic gases, in which a good prognosis is doubtful. Lanes quotes the case of a woman twenty-nine years old who died from this cause. I believe, therefore, that the prognosis will improve when we diagnose this complication more promptly and consequently give the adequate treatment at an earlier stage. I feel sure that my first case resulted in death because, not knowing this complication at that time I operated at a very late stage.

So, the surgeon has not a waiting part to play: on the contrary he must draw off the liquid at the earliest possible moment. He has the choice of two methods, puncture with aspiration and incision with drainage. I believe the first may be usually used, if the general condition of the patient permits. I cured my third case with only one puncture. Naturally in cases of frankly purulent effusions accompanied by fever, sweats, and bad general condition, we must not think of puncture but consider it as if it were a case of abscess, incising without delay and employing ample drainage, with lavages of oxygenated water and Dakin's liquid to fight the anaerobic infection. As a rule this sinus heals rapidly, but it may remain open for a considerable time, as in my second case in which the drainage continued for three months. You must remember that it is not necessary to evacuate the cavity down to the last bubble of gas. The little hydrogaseous residuum will sooner or later be reabsorbed, and you may prove this by regular radioscopic examinations.

Since the source of infection is attributed to the bile, attempts have been made to practise in all cases to be operated for hydatid cysts of the liver, a preoperative and postoperative biliary antiseptis, consisting of the administration some time previous to operation of salicylate of sodium, ox bile, etc., but I do not consider this remedy efficient. Delbet has proposed to aspirate the air before closing the sac, but this I believe to be dangerous on account of the hemorrhage or bile discharge that may be produced *ex vacuo*. The *capitonage* also proposed by Delbet (40) is no good: it is a useless maneuver, difficult and dangerous to perform because when the needle is passed through the pericyst it may easily injure the bloodvessels or bile ducts and this contributes to the production of a pyopneumocyst: moreover, it is not a preventive to this complication, as a case of Gregoire's (41) has proved. Devé proposed the simple method of squeezing the sac with the hand before closing it but this has not yet been sufficiently practised to enable us to judge the results. Cerné proposed the resection of the costal margin.

My own belief is that the air has but slight importance in postoperative cystic infection and I base this belief upon my extensive personal statistics, in which I have proved the excellence of the Australian method applied as the treatment in cases of clean hydatid cysts of the liver.

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TREATMENT OF PAINFUL DYSPHAGIA IN TUBERCULOUS LARYNGITIS.

With Special Reference to Nerve Blocking.

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Tuberculosis of the larynx is a frequent complication of pulmonary tuberculosis occurring symptomatically and clinically in twenty to twenty-five per cent. of cases, and pathologically and anatomically in a much higher percentage. Fetterolf, in a study of 100 consecutive autopsies in cases of pulmonary tuberculosis, found that eighty-three per cent. of the larynxes showed tuberculous involvement in some degree. From his studies we learn that laryngeal involvement in tuberculosis is much underestimated clinically, often because the patient does not complain of the throat and a routine examination of the larynx is not made. I have seen cases in the Jefferson Hospital Department for Diseases of the Chest, in which the patient when questioned absolutely denied that his throat bothered him in any way excepting that he was a trifle hoarse at times, which he attributed to excessive cough. Upon examination of the larynx, as a routine procedure, I have found marked infiltration and even ulceration, which would have been missed if an examination had not been made.

That the laryngeal lesion follows the chest lesion as to progression or regression is an exceedingly poor working theory, inasmuch as one is apt to give

all attention to the chest condition to the neglect of the laryngeal condition. In ordinary infiltration without erosion or ulceration I believe the laryngeal condition will follow the pulmonary condition, but when ulceration once takes place, with its attendant secondary infection, the laryngeal condition will follow its own course, regardless of the pulmonary condition. Therefore, the larynx should be carefully and conscientiously treated independently of the chest. The occurrence of laryngeal tuberculosis is an ominous sign. It is practically always secondary to a process in the lungs and one of its most distressing symptoms is the difficulty and pain in swallowing. Fortunately it does not occur in all cases, but when it does occur we face the very serious question of nutrition and rest which are of paramount importance in treating tuberculosis. In the past two years among about 500 cases I have observed it in at least twenty cases, or four per cent. In advanced laryngeal tuberculosis pain is the predominating feature and calls for immediate attention. The patient not only suffers from the pain, but also suffers the pangs of starvation with its attendant hunger and thirst. The thirst at times is exceedingly distressing and, strange to say, the swallowing of water is most painful in the majority of cases, and these patients crave water more than other liquids. Semisolids are the easiest swallowed.

The conditions causing dysphagia are edema and ulceration, especially of the epiglottis and arytenoids. In a few cases the dysphagia undoubtedly is due to an extralaryngeal process. These cases are most rebellious to treatment.

Prophylactic treatment of dysphagia is of the greatest importance. Every case of pulmonary tuberculosis should be regarded as a future laryngeal case with its attendant dysphagia. The nose and throat should be examined and any condition which interferes with proper breathing treated locally or surgically if the pulmonary or general condition permits. Alcohol and tobacco especially should be absolutely forbidden. One patient admitted to the Jefferson Hospital, knowing that tobacco would be prohibited, went on a cigarette debauch the day preceding and acquired a marked acute laryngitis with considerable pain, which had been absent up to that time. In spite of treatment his larynx became rapidly worse with great dysphagia.

The food should be of the blandest type. Upon the advent of hoarseness absolute rest of the voice should be impressed upon the patient. Cough, which is always excessive, should be allayed by sedatives. A great deal of the cough is unproductive, and consequently unnecessary and only aggravates the larynx lesion. Cocaine, perhaps, is the oldest and most widely used of the local applications for dysphagia. It very often relieves the pain temporarily, but has several disadvantages. In the first place it must be used very frequently and only by the physician and unless he is skilled in larynx work it is very likely to be ineffectual. Its use is often followed by more or less reactionary edema and it must be increased in strength to give relief. Both morphine and cocaine tend to disturb the alimentary tract, which is already taxed to its utmost. Appetite, which

is of much importance in tuberculosis, is greatly lessened by these two drugs. Camphor and menthol in liquid alboline as a spray to the throat gives relief and is convenient, inasmuch as it can be used by the patient whenever necessary. It has a somewhat anesthetic effect and is cooling to the throat. Insufflation of orthoform and analgesin gives relief for as long as twenty-four hours; it can be used by auto-insufflation. Cracked ice, either sucked or applied externally, has its value. The various applications, formalin, lactic acid, argyrol, and more recently used, scarlet red, cleanse the ulcers and promote healthy granulations, thereby preventing or relieving dysphagia. Of the operations on the larynx I will mention only one, amputation of the epiglottis, which is necessary in some cases when there is ulceration of the laryngeal surface. The "horse position" very often allows the drinking of fluids with decreased pain.

The purpose of this paper is mainly to urge the use of nerve blocking of the internal branch of the superior laryngeal nerve for painful dysphagia and to report results of its use in nineteen cases in the Department for Diseases of the Chest of the Jefferson Hospital. Hoffman originated the method of injecting the internal laryngeal nerve for dysphagia and reported two cases in 1908. Levinstein two years later mentioned six cases. Lewy was the first in this country and he recorded two cases. Fetterolf in 1912 reported sixteen additional cases, seven of which had complete relief after one injection; three had complete relief after two or more injections; four had partial relief; two had no relief. Various writers have since observed cases which showed excellent results from injection of the nerve, but in spite of this a great many physicians either do not know of the procedure, or do not use it, feeling that the patient has but a short time to live and that nothing but morphine or cocaine would give relief for the suffering.

As in other procedures, there are a few failures. These failures are due to faulty technic, to anomalous position of the nerve, or to the fact that the tuberculous process causing the dysphagia is external to the larynx.

The method which I use is that of Hoffman, except that I do not go in at right angles to the nerve, but a little forward, directing the needle inward and backward. Thorough asepsis should be used throughout as regards the operator's hands, instruments, and skin of neck. The instruments and solution required are a Luer's or Record syringe, tincture of iodine, and the fluid for injection, which is a sixty-five to eighty-five per cent. alcohol. A hypodermic syringe may be used, with a one and one half inch, twenty-four gauge needle with a sharp point. I use a solution consisting of novocaine, two grains; chloroform, ten minims; alcohol, six drams; water, two drams—essentially a sixty-five per cent. solution of alcohol.

The patient should be either lying supine with the head, neck, and shoulder raised on a pillow and the head turned to one side, or sitting upright in a chair with a comfortable back. I prefer the sitting posture with the head in a natural position and the neck not rigid, which seems to be most convenient for the patient and the operator alike. The greater

cornu of the hyoid bone and the superior cornu of the thyroid cartilage is located with the index finger of the left hand and the loaded syringe held in the right hand. The needle is then thrust through the skin about one inch anterior to the directing finger and a quarter inch above the margin of the thyroid cartilage and pushed backward and inward, the point being raised from time to time to locate its position by the directing finger tip of the left hand. The patient gives the signal of pain in the ear by raising his hand. The nerve has been touched and a drop or two of solution is injected and a few seconds are allowed to pass to see if there is cough due to the fluid entering the lumen of the larynx. If a cough develops, the syringe is withdrawn a little and a few more drops injected. If no cough is present then 0.5 to one c. c. of the solution is injected, moving the needle around so as to surround the nerve thoroughly. Usually the pain in the ear is intensified by the discharge of the fluid into the tissues about the nerve, but passes off in a few seconds. One or both sides may be injected at one sitting. I have injected both sides eighteen times in thirty-six injections and have noticed no untoward effects that I could ascribe to the bilateral injection. One patient complained of a "slight constriction" in the throat but on the other hand, another patient complained of the same thing who had only the left side injected. These were the only two patients who had any untoward effects, and this passed off in a few days, and in none has paralysis or swelling developed.

The side to be injected depends upon the site of the greater pain in swallowing, the site of the lesion, and the side on which the nerve is the more tender. If injection of one side does not wholly relieve the pain the other side is injected at the same sitting. If the pain is not then relieved the nerves are injected at intervals of three to five days. Only one case showed no benefit after one or more injections, and in this case the lesion of the larynx was very slight. It is possible that the dysphagia was due to an extralaryngeal process. I always have the patient try to drink water before and immediately after the injection and note the difference. In the earlier operations I have had him eat crust of bread in addition to drinking the water, but found that it was unnecessary. Second injections were often made at the request of the patient. None of them objected to subsequent injections. One patient, when asked if the relief of the dysphagia was worth the pain of injection, replied, "It hurt like hell, but the relief was like heaven." I want to say that the technic practised in this particular case was the one which I was originally taught, namely, the use of a blunt needle. I now use a needle with a sharp point.

No contraindications to the injection are known.

A summary of the results of the nineteen cases is as follows: The ages ranged from twenty-two to forty-eight years. All were males with the exception of two. Tubercle bacilli were present in the sputum in all cases except one. All except five were far advanced pulmonary cases; four were moderately advanced; one had tuberculous epididymitis and but slight pulmonary changes. Twelve had involvement of the epiglottis, nine of which were of the turban type, and all presented ulcerations.

Thirty-nine injections were made, twenty-one of which were bilateral; nine were made on the right side and nine on the left side, making eighteen unilateral injections; six had absolute cessation of pain within a few minutes after the first injection and one within twenty-four hours. One had partial relief after the first, and absolute cessation after the second injection. One had no relief after the first, and absolute cessation after the second injection. Nine patients had only very slight discomfort after one or more injections. Only one patient had no relief. This patient was dying at the time of the injection. The relief was marked in all cases. The shortest period of relief from one injection was three days and the longest forty-two days. The shortest total number of days of relief from more than one injection was six days and the longest 105 days. Eight patients had but one injection; four had two injections; four had three injections; three had four injections. Two patients left the hospital before the return of pain. Five died in from six to twenty-four days after injection without return of pain. By relief of pain I mean relief of any discomfort whatever.

CONCLUSIONS.

In all cases of painful dysphagia the internal laryngeal nerve should be blocked. There are no contraindications to nerve blocking and this procedure aids the dietetic treatment by removing or lessening dysphagia sufficiently to allow the patient to eat necessary food.

More rest is obtained due to cessation of pain from the throat, and any number of injections may be made and the patient kept in constant comfort by injecting as soon as the pain recurs.

Histological examinations of injected nerves showed that the results modified the nerve trunk very little and was usually fibrosis, and in some cases numerous spaces within the bundles of the nerve fibres.

The writer wishes to urge the wider use of this method of treating painful dysphagia in tuberculous ulceration of the larynx, as it is a procedure which can be learned easily and practised by the average practitioner.

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Nonoperative Treatment of Perimetritis.—D.

Vital Aza (*Revista de medicina y cirugía prácticas*, October, 1917) outlines his treatment as follows: absolute rest in bed; continuous application day and night of an ice bag; purgation with castor oil or Carabana water; abundant nutritious diet—milk in limited amount, vegetables, fish, fowl, fruits; and the use of antiseptic vulvar and vaginal irrigations. If the pain does not subside after two or three days of this régime, then aspirin or acetanilid may be given, avoiding if possible the opiates on account of their congestive action and the intestinal paresis which they produce. This plan should be followed for three or four weeks without changing the patient from the horizontal position even for urination or defecation. Surgical measures must be resorted to in such cases as do not yield to expectant treatment.

THROMBOPHLEBITIS OF THE INFERIOR VENA CAVA COMPLICATING VARICELLA.

By S. A. BLAUNER, M. D.,
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Varicella with its occasional complications is not generally a severe infection and when it or a complication assumes an unusual course it is of sufficient interest to record it in the medical literature. In the present instance the course of the disease was mild but the after coming complication was so unusual and out of the ordinary that a report of the case, especially in the absence of any similar report, seems advisable.

The complications of varicella are infrequent and, as a rule, mild. Acute nephritis seems to be the most common one. No mention is made anywhere of thrombophlebitis of the veins or vena cava with the exception of a case involving both saphenæ reported by Phaulder and Schlossman (1). Thrombophlebitis of the inferior vena cava is a rare condition under any circumstances and certainly is exceptional as a complication of varicella. One hesitates to come to this conclusion, but the history and symptoms are such that the diagnosis is justified.

CASE.—On March 10, 1917, E. L., eleven years old, son of a physician, became ill with varicella. It was a mild infection and patient was not sufficiently indisposed to go to bed, in fact, so mild that neither pulse nor temperature was taken. The vesicles were moderate in number, principally on the back and chest, and metamorphosed in the usual normal manner. Seventeen days after the onset of the varicella, in the afternoon of March 27, 1917, the child complained of fairly severe pain in the region of the left hip, radiating somewhat down the left thigh, and in the evening of the same day, pain became so intense as to necessitate his going to bed. A physician who saw him that evening pronounced it monarticular rheumatism of the hip, for the sudden onset and intense radiating pain characteristic of hip joint inflammation made this the most likely diagnosis. In the morning of March 28, 1917, approximately one half day after the onset of condition the child experienced sharp excruciating pain in the left lower inner abdomen just above the inner half of Poupart's ligament, the overlying integument becoming almost immediately pale and glazed in appearance. In the afternoon of the same day similar pain occurred on the right side of abdomen, followed in the evening by swelling and pain along the entire length of the right lower extremity and next morning by pain and swelling along the entire lower left extremity, the side on which symptoms originally began.

The patient was seen by me on the evening of the third day with the venous circulatory symptoms fully developed. He looked sick and in pain, lying flat on his back with lower limbs slightly flexed, requesting not to be moved or touched on account of the pain. Both legs, especially the left, and both feet were swollen and the skin pitted moderately on pressure. Both saphenæ down to near the knee joints stood out prominently, but on palpation the right was more tender and cordlike to the touch. The other veins of the thigh were fairly visible, becoming indistinct on the legs and again prominent on the dorsum of both feet, particularly the right. Circumference of the extremities by measure was about the same and all subsequent measurements till the stage of retrogression set in, did not show much of an increase in the swelling.

The abdomen showed marked venous circulatory disturbance. At the very outset, with the onset of pain the skin became pale and glazed, which wore away after an interval of several days. Further, the abdomen was voluntarily rigid, such severe pain being complained of on deep pressure that the deeper veins could not be palpated with certainty. The surface veins of the abdomen were already visible at the first examination, and became more

so during the course of the disease, and nearly five months after discharge of the case they were extremely prominent, some even to the point of tortuosity.

The surface veins of the abdomen presented interesting data for study, for through their prominence they gave us a clue as to the course of the collateral venous circulation and therefore information as to the probable pathological site. Beginning on the outside of Poupart's ligament where they began to become prominent they ran upward, involving the entire abdomen except for an area about the very centre about two inches on either side of the centre of the pubes upward to about two inches above and to either side of the umbilicus. From the abdomen the visible veins ascended to both sides of the chest terminating a little above the nipples except on the sides, where there were some veins running to the axillæ.

The liver was two and one half inches below the costal border; the spleen was not palpable; the heart and lungs were negative. The fever was of an irregular remittent type ranging from 100° to 104° F., and the pulse was soft and rapid, varying from 104 to 120. Blood count on three different occasions showed an average leucocytosis of 15,000, the polynuclear predominating. The Widal, taken twice, and blood culture were negative. Urinalysis was negative but the pain at the end of micturition lasted about a week, indicating either an extension of the thrombotic condition to the vesicular veins or, what is more likely, a distention of these veins. There was no history of thrombosis nor of typhoid, measles, or pertussis in early childhood.

There can be no doubt that this symptom complex represented an involvement of the deep veins of the abdomen, otherwise it would be difficult to explain the almost simultaneous enlargement of the veins of both lower extremities, of the abdomen, and of the chest. Aside from the initial areas of pain and tenderness which indicated the course of the thrombosis itself, the venous engorgement represents the effort to establish the venous circulation through collateral anastomosis. To account for this circulatory disturbance, we must assume one of two possibilities: 1, involvement of both common iliac veins, or 2, involvement at the junction of these veins which is the inferior vena cava. Either one will necessarily give identically the same symptoms and the differentiation is to be sought in the history. Our history informs us that pain, edema, and all the other symptoms developed within thirty-six hours, pointing to a common origin. It is possible, as Osler (2) mentions, that the initial origin is in one iliac extending upward to the inferior vena cava and down again to the other iliac vein but in either case there would be an involvement of the inferior vena cava.

An aid to our diagnosis are the dilated veins of the lower chest. They represent the engorgement as a result of the azygi returning, at least, some of venous blood from the lower half of the body. Anatomically we know that the veins of the upper chest which is free from dilated veins in this patient ultimately end in the superior vena cava, while from the fourth interspace downward at approximately the line where the dilated veins end the venous blood eventually flows into the azygi. The azygi are an offshoot from a branch of the ascending lumbar, while the ascending lumbar, communicating through devious means with the veins of the abdomen and common iliac, finally ends at the under surface of the inferior vena cava. In other words with an involvement of both common iliac veins or inferior vena cava the collateral circulation would be established by at least the ascending lumbar and azygi.

Thrombophlebitis is a rare condition under all circumstances. With the exception of a case—congenital?—reported by Alfred Meyer (3) there is but one monograph on this subject by Richard Sinnhold (4) published in 1865 with a classical review of nineteen cases including two of his own in which he concludes that thrombosis of the inferior vena cava presents several of the following cardinal symptoms: 1, chill; 2, edema of lower extremities, lower back, testicles, and scrotum; 3, enlargement of veins of lower extremities and back; 4, congestion of kidneys; 5, diarrhea; 6, metastasis particularly of the lungs. Leale (5) in a report of a case of thrombophlebitis of the external iliac veins emphasizes the importance of abdominal pain and glazed appearance of overlying skin and when we review the symptoms of our patient, we note the close similarity of symptoms justifying the diagnosis of thrombophlebitis of the inferior vena cava.

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204 WEST 110TH STREET.

SYPHILITIC BLOOD ON THE SURGEON'S FINGERS IN THE INTRAVENOUS ADMINISTRATION OF ARSENICALS.

By N. B. JENKINS, M. D.,

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In intravenous administration the fingers of the surgeon are frequently bathed in the blood of syphilitic patients. In free clinics for syphilis too many operators give their own safety little attention. In an hour or two of work the surgeon's fingers may be wet time and again with blood laden with the deadly *Treponema pallidum*. Each additional contact with the syphilitic blood may be more and

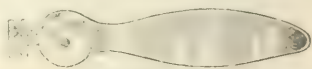


FIG. 1.—Needle holder.

more dangerous, since the protective skin is more and more thinned by frequent cleansings of the hands. Once the needle is home in the lumen of the vein the blood flows profusely, and the field of operation frequently becomes bloody before connection can be made between the cone shaped metal end piece on the tubing and the funnel shaped needle end. The better the rubber, the more it wobbles, and the greater the difficulty and delay, and there may be fumbling or trouble at times whether the tubing is held by fingers near to, or a few inches away from, the end piece. In the mean time the surgeon's hands may be bathed in blood.

General toilet of the field helps to protect the hands. Rubber gloves are used by many surgeons. Small needles draw less blood than large ones, and their use exposes the surgeon's hands to less blood. The common syringe method is comparatively safe for the physician, and some operators of the gravity tank

connect the tubing and needle before entering the vein. This may mix bloods. A needle holder, here illustrated (Fig. 1), and a stiffening for the rubber tubing (Fig. 2) tend to keep the fingers out of the blood. Some of the following stiff-

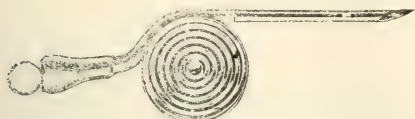


FIG. 2.—A stiffening for rubber tubing.

eners may be useful on the needle end of the rubber tubing: a barrel of a smallest size Luer syringe; a thin metal or composition hollow cylinder two or three inches long, with both ends open and of a size to slip over the tubing at the end piece, which

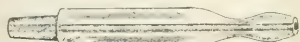


FIG. 3.—A scientific glass end piece or connector.

can be made of a thermometer case, or glass tubing; splints tied alongside the tubing; unlocked artery forceps grasping the tubing at the end piece and acting as a guider and a shutoff at the same time. A scientific end piece or connector of glass is here illustrated (Fig. 3). It is taken from a circular which does not give the inventor's name. After the day's work is done, use on the hands of preparations of mercury or arsenic may destroy any remaining spirochetes.

TIMES BUILDING.

Abstracts and Reviews.

THE EFFECT OF HIGH EXPLOSIVES ON THE EAR.*

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Professor Wilson prefaced his address by saying that he had had the good fortune to have spent nine months in Europe, partly in a special Canadian ear hospital in England, and partly in France at casualty clearing stations and base hospitals. It was there that he was able to study the cases of war deafness at times varying from twenty hours to over eleven months after their injury. Previous wars had brought forth extremely few cases of deafness without direct injury to the ear by missiles, but this war was a war of high explosives and tremendous shells, weighing from many pounds to a ton and containing as much as 200 pounds of high explosive in a single large shell. Some cases of deafness or impaired hearing had been seen previously in naval gunners and artillerymen, who were continually exposed to the detonation of their own pieces, but at the present time the deafness from explosives was most commonly encountered in the men in the trenches and dugouts. This was due to the fact that they were frequently exposed

to the violent explosions of the enemy's shells, against which they could not guard as could the gunners of the navy and artillery. These latter had been taught to protect their ears by wearing cotton or wax plugs and by opening their mouths at the time of firing their pieces, the latter affording a very satisfactory degree of protection which was not available to those exposed to the unexpected explosions of hostile shells. Some idea of the frequency of ear affections resulting in the present great conflict could be obtained from the statistics of French observers who found some degree of war deafness in sixteen per cent. of the total injured and in 4.5 per cent. of the total of those evacuated to the bases. Professor Wilson thought that these figures were rather too high, but they served to indicate the great number of cases of incapacity which was caused through deafness. This was even more apparent when it was remembered that about eighty per cent. of those originally showing some deafness were more or less permanently impaired for return to their civil pursuits by reason of their loss of hearing.

The cases of deafness due to war conditions could be divided into two main classes, one including all cases in which there had been a direct wound of the ear by a missile and the other including those injured by the effects of an explosion without direct wound of the ear. It was the latter class alone which would be considered. These cases had been termed shell shock deafness and there had been a great tendency to associate the condition with hysteria and neurasthenia. In the study of these cases, however, one should dismiss from his mind all preconceived ideas and should avoid the terms "shock," "hysteria," and "neurasthenia." The study should be approached with an open mind.

The ear was an elaborate organ designed to transform one form of external energy into nerve impulses and was made up of two distinct mechanisms. The one was adjusted to transform external pressure changes into hearing; the other, minute internal pressure changes into nerve impulses which controlled equilibrium. In hearing, air vibrations from thirty-two double vibrations a second up to several thousand were caught by the delicately hung drum membrane, transmitted by it to the ossicles, and by them to the cochlea where they were transformed into nerve impulses and carried along the cochlear nerve and acoustic path to the temporal lobe of the brain. This mechanism, however, was not one continuous path, but the connection was broken at several points by nerve synapses. There were certain normal limits to the capacity of this apparatus to withstand pressure changes, and pressures beyond the normal caused disturbances of hearing such as hyperacusis, hypoacusis, or total deafness. The effect of a high explosive was a great and sudden compression followed by an equally great and sudden decompression. This compression and decompression could amount to 10,000 kilograms a square metre.

The men with symptoms of nerve deafness due to the effects of high explosives could be classified as those with true nerve deafness; those who had had nerve deafness and who retained the fixed idea

*Summary of a lecture delivered before the Harvey Society at the Academy of Medicine, New York, February 9, 1918.

that they could not hear; and those who were malingering. The first class alone was to be discussed, and in this class there were three groups of cases. In the first the nerve deafness was associated with damage to the conducting mechanism, such as perforation of the tympanic membrane, hemorrhage into the middle ear, or infection of the middle ear. The second class comprised those cases in which there was no demonstrable lesion in the conducting mechanism, and the third, those in which there was destruction of the cochlea and semicircular canals or their nerves. The deafness might be partial or total in either of the first two classes, but was always total in the third. The symptoms of all three classes fell within the description of traumatic neuroses and most of the patients exhibited variable and complex symptoms aside from deafness. Such symptoms included the various common manifestations usually associated with neurasthenia or hysteria.

A striking feature of the cases with injury to the tympanic membrane was observed, namely, the great frequency with which infection of the middle ear occurred. This alone made it more than desirable that competent otologists should be connected with the hospitals as much of this infection and suppuration with its disastrous aftereffects could be prevented by proper and immediate treatment. This treatment should include insertion of a plug of cotton into the external meatus while the external ear was thoroughly cleansed and dried. Then the plug should be removed and the outer part of the auditory canal should be cleaned with pledgets of cotton soaked in hydrogen peroxide, dried, washed with cotton dipped in alcohol, dried again, and the canal blocked with sterile cotton. This would largely eliminate the danger of infection.

Turning to a consideration of the cases of nerve deafness in which there was no evidence of structural injury, the author pointed out that this absence of evidence did not preclude the possibility of some microscopic damage to the structures of the internal ear. Some investigations had been made by several workers on the effect of pistol shots on the internal ears of lower animals and these had shown that there was a fairly constant lesion produced. This lesion was confined to the cochlea and consisted in a collapse of the organ of Corti and a tilting up of the membrana tectoria against the membrane of Reissner. It was very difficult to secure material from human beings known to have sustained the effects of high explosives and developed nerve deafness. Two such specimens were secured within six hours after death and had now been subjected to careful microscopical study. In these the lesions were also found confined to the cochlear structures and closely resembled those just described as found in animals. The membrana tectoria was found swung up against Reissner's membrane and was attached to it by a serous and cellular exudate. The organ of Corti showed marked swelling of the cells, and microscopic hemorrhages were found in the internal ear alone with evidences of an acute neuritis of the eighth nerve. No hemorrhages were found in Corti's organ. With these lesions it was found that the stapes was intact and the vestibule had not been injured.

Various methods had been tried for the improvement of hearing in these several types of nerve deafness, but none had been found to be of the least value in cases where the internal ear was destroyed. In all other cases, whether totally deaf or only partially so, the most successful plan of treatment included the use of tuning forks applied to the bones, through resonators, and through the air and the use of the voice through resonators, speaking tubes and the air. These normal stimuli were applied for short periods twice daily until there was some sign of restoration of function, and when this once appeared the treatment was continued until in many cases very marked improvement was obtained. Electricity was found to be of no value and to be actually harmful in many cases. It was noted that often the patient would hear the sounds but would be very slow in appreciating them and recognizing them. The ability to recognize sounds usually returned, but might always remain somewhat slow so that words had to be repeated several times before they were understood.

In closing Professor Wilson spoke of the possible means of preventing damage to the ear by high explosives and mentioned the use of cotton plugs only to condemn them as worthless. Wax or cotton impregnated with petrolatum was more efficient but had the disadvantage of cutting out all sound. Several devices had been brought out, one of which, the Mallock-Armstrong, permitted the hearing of the spoken or even the whispered voice, but was closed by violent concussions and so protected the ear. This device was relatively large and had the great drawback of causing much discomfort and irritating the auditory canal so that the men would not wear it. Recently the author, together with Prof. A. A. Michelson, had perfected a very small and simple hard rubber device which permitted the hearing of all normal sounds but which also closed tightly in response to loud noises and protected the ear against injury by detonations. This device was smaller than the Mallock-Armstrong protector and did not irritate the canal or cause any discomfort to the wearer.

Treatment of Wounds by Solution of Soap.—R. Garside Dixon and H. T. Bates, (*Lancet*, November 24, 1917) following the lead of certain French surgeons employed a 2.5 per cent. solution in water of common yellow soap, or of the soft, green soap of the British Pharmacopoeia, in the treatment of 368 cases of war wounds, representing all types, with the most encouraging results. The solutions were used in the place of antiseptics and applied either as wet dressings, or by means of Carrel's tubes. Irrespective of the nature of the infecting organisms, not excepting the gas bacillus, the wounds almost invariably did well under this dressing solution. The most striking features of the use of these soap solutions were the great reduction in pain, the absence of pus, and the healthy, red condition of the wound surface when the dressings were removed. The solution also had the advantages of cheapness and required a less amount of dressing material.

Medicine and Surgery in the Army and Navy

WAR HOSPITALS IN THE UNITED STATES.

Factors of the Problem.

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Military discipline.—A paramount consideration, as it appears from advices from the Surgeon General's Office, is proper military control of the men. It may be admitted at once that this is an important consideration and that, other things being equal, it would be desirable that hospitals for soldiers should be purely military establishments. It would seem to be an easy matter to provide proper means of control. Officers and men for such purposes must be detailed wherever the hospitals are located, and if the units in civilian hospitals were sufficiently large in a given area and properly segregated from civilian cases, as they should be, the difficulty of providing properly for their control is not apparent.

All hospitals dealing with soldiers should be under the supervision of the Surgeon General as far as military relations are concerned and agree to conform with military, as distinguished from medical, requirements (1).

Military administration.—The same questions arise here and the same solution is suggested as in the problem of discipline. Provision must be made for the keeping of records, granting liberty and discharges, payments, clothing, etc. With regard to these and other questions it should be remembered that the large proportion of men are intrinsically civilians and have the right to restoration to this state as soon as possible. Given a grouping in sufficiently large numbers, the necessary machinery could be provided with no more difficulty than in an isolated military hospital.

Construction of hospitals.—This and the following factors enter into the problem with tremendous force. There are about 813 general hospitals of fifty bed capacity or over in the whole country, with an aggregate of less than 130,000 beds. The problem of much more than doubling the present capacity, in view of the need of labor and building materials for all purposes, is very serious and perhaps unsolvable. Experience with cantonment hospitals demonstrates this difficulty and the consequent danger of delay. As far as possible, then, it is common sense to eliminate construction.

How may this be done? The essence of a hospital, its true reason for being, is its administrative department, including operating rooms, laboratories, x ray rooms, sterilizing rooms, supply rooms, quarters for nurses and physicians, so that their services are quickly available, etc. Were it not for these, patients might remain at home or be quartered in hotels or barracks. It so happens that these facilities are capable of largely increased use, their present use being limited by the bed capacity of the hospital of which they are a part. It follows that if bed capacity were increased, the use of the general

departments of a hospital could be proportionally increased with very little additional construction. Moreover, the quality of construction of such departments and their adaptation to their various uses is more costly and difficult than in the matter of bed space. Patients having the use of the administrative rooms of existing hospitals would therefore have much better facilities than could be provided by temporary construction, if indeed it could be provided in time at all, when it is remembered that additional construction of all parts of hospitals is imperative for foreign service.

Whatever may be said of the importance of military discipline, it certainly cannot be maintained if hospitals cannot be constructed in time to house the men who are subject to it. If construction is concentrated on bed capacity and rooms immediately related thereto, the possibility of provision for discipline is immediately improved, to say nothing of other considerations. No one can say that the supply of labor and building materials is assured and ample, and it is the part of wisdom in these times to demand as little in the building line as possible.

Equipment of hospitals.—The equipment of a surgical hospital is necessarily complicated and costly and the product of high skill. It consists of scientific apparatus from laundry washer to surgical instruments. Much of it requires special rooms for proper use. To hope that, with the present demand for high grade materials and skilful mechanical labor, the present supply may be more than quadrupled in a limited period, is to be unreasonably optimistic. Again the use of equipment in existing hospitals may be tremendously expanded by the mere placing of additional beds in relation with it. Most hospital apparatus and instruments may be repeatedly used as long as there are patients who require them and hands to use them. Where they do not exist, though there be physicians and nurses, the patient must suffer. The problem of providing hospital equipment and surgical instruments for service abroad is difficult. To make it more easy, the supply at home should be conserved to the fullest extent.

Relative cost.—This is worthy of consideration, though compared with other factors it might be disregarded. The paramount consideration is the physical restoration of our citizen soldiery. Nevertheless it is sure that the present exigency will in time cease, and then unnecessary duplication of construction and equipment will result in tremendous waste. When the period of readjustment comes, the financial situation will be a very important factor in the welfare of the citizen.

Medical personnel.—This question divides itself into two parts, the present supply and the future supply. The supply of medical men in England and France already approaches exhaustion, although supplemented by volunteers and assignments from this country as appears by the following:

"The [English] Medical War Council seriously recommends that medical students now serving should be dismissed to continue their studies" (2).

"No more physicians can be called up for the army without seriously endangering the civilian service. English doctors are therefore being replaced by Americans. . . . The mistake made by the War Office consisted in not consulting the professional committees" (3). It is estimated by Doctor Dickinson for the Medical Section of the Council of National Defense that "after the present needs of the army and navy have been satisfied we have left a very scant margin to draw upon." It goes without saying that the best source of supply for military service is the staff of large general hospitals supplemented in certain districts by men practising in so called open hospitals. The data of the Council of National Defense indicates that not more than twenty per cent. of these are available for military service and from a recent compilation by the American Hospital Association it appears that twenty-four per cent. of the members of the staffs of hospitals having a capacity of fifty beds and over are already in service or awaiting commissions out of a total of about 17,500. In January, 1916, 16.5 per cent. of the profession are in commission in the army, navy, and Public Health Service. If we figure so as to allow half the visiting staff to remain to run hospitals of the country, there are available for war service a further fifteen per cent. of the total number of medical men of the United States. Moreover, the Surgeon General testified to the Committee on Military Affairs of the Senate of the United States, on January 25, 1917, that "the cream of the medical profession is already in the service."

These being the facts, whence will come the supply to fill the need created by vacancies or by additional requirements as the war continues? Manifestly the existing supply must be conserved in every possible way and added to by the education of more men. The product of the medical schools must be finished by education in the hospitals, as in such manner only can surgeons be trained, and as many of our soldiers as possible must be taken care of by men who are unable, by reason of age, infirmity, or other conditions, to engage in foreign service. The only way to accomplish this is to send the returned soldiers to existing hospitals. Thus the men who remain at home will fulfill two functions: aid in the work of restoration, and carry on the work of producing a new supply, by educative means, in the medical schools and hospitals. There are normally about 3,000 interns in the larger general hospitals, a large proportion of whom will be available for military service when their education is completed, and this number is renewed from year to year. It should be increased and every effort made to complete the medical education of these men as efficiently as possible.

To turn these embryo physicians into the evacuation hospitals abroad without adequate clinical experience, under skilled supervision, would be a repetition of the mistake made in England above referred to. Moreover, as will be suggested later, nurses also must be properly trained under competent men in hospitals properly organized for such work. If purely military hospitals are established at home this organization for education and clinical experience will be disrupted, a large amount of available professional material will be made useless

and a consequent lack of proper medical attendance may be definitely prophesied.

Nursing personnel.—Referring again to the estimates made for the National Council of Defense, army requirements are two nurses for each doctor. Therefore for the first army 20,000 nurses are needed; for the second army 20,000 nurses are needed; and thereafter, 20,000. The total nursing requirement, therefore, is 60,000. There are in the United States a total of 200,000 nurses. Exclusion of physically unfit, retired, married, "practical" nurses, not registered nurses, and aliens, leaves available about 60,000. In the general hospitals there is one nurse for 3.5 beds. This includes pupil nurses, so, let us say, the army hospital requirements are one nurse for ten beds. In 1910 there were 155,000 beds in public institutions, not including insane, penal, and for private gain, making the requirement for nurses in such institutions alone 15,500, leaving a balance available of 44,500.

To this must be added the need for public health nurses, already large and growing; for necessary private nursing, and for nurses in the institutions not listed. How is the lack to be met? There are only two ways: one by supplementary assistance, the other by the constant education of new nurses. The only way of producing either method of supply is by education in properly organized general hospitals. Of 858 hospitals reported, 777 had training schools for nurses, and on these and some 300 smaller hospitals, also teaching nurses, must reliance be placed to fill the need. To enable this to be done there are several requisites. There must be physicians to teach and provide clinical material. There must be leading nurses and superintendents to supervise and demonstrate. There must be clinical material in the form of patients. There must be money to enable the hospitals, already restricted in funds, to carry on the work. The number of nurses to be trained should be increased and their course of training shortened if possible.

To do this the number of patients must be increased, as pointed out above, for financial and clinical reasons. The staff physicians and trained nurses must remain at their posts. As in the case of construction, equipment, and medical personnel, there must be conservation, and the only way to accomplish all these absolutely necessary objects is to utilize the present hospitals.

General hospital personnel.—In the same way, and for the same reasons, the general hospital employee should be conserved; superintendents, dietitians, engineers, cooks, laundry men, and attendants of various sorts, educated in hospital work, are few. The supply is not now sufficient to meet the need and when the demand comes to fill positions in the tremendous expansion of hospital work for military needs, both military and civilian hospitals will surely lack. The only reasonable thing is to save in every way possible.

Reconstruction work.—A problem directly correlated with the foregoing is that of the reconstruction hospital. This has been most prominently brought forward, up to the present time, with regard to orthopedic work, and plans have been considered for special hospitals of this nature. Clearly

the work is not limited to orthopedic practice. The modern general hospital is in itself a congregation of specialties where each may supplement the other for the ultimate welfare of the patient. It would seem a grave error to abandon a principle which has been so carefully and successfully cultivated. The result would be a number of special hospitals with duplication of buildings, equipment and personnel, and without facility for the complete care of the patient. On the other hand, the establishment of a hospital for purely military purposes to meet this need would present all the difficulties already pointed out, and these would be accentuated by the paucity of specialists who could be spared for the comparatively temporary purposes of this hospital. For example the figures of the Council of National Defense show that only five per cent. of the surgeons among the first 14,000 recommendations for the Reserve Corps are orthopedists, and this is a specialty requiring special adaptability and long training, as indeed do others. Moreover, the installation of special machinery would be costly and the opportunity for its use short, while the same installation in an established hospital could be continued in use for civilian purposes long after the need for military use had disappeared. This is the opinion of men accustomed to reconstruction work as made necessary in industrial accidents under the workmen's compensation acts and is worthy of careful consideration.

Outpatient service.—As before suggested, our army is not a professional army. All types of citizens are represented, men with families, men with financial and business obligations, and men accustomed to other than military modes of life. It would be inhumane and inefficient to confine these men to hospital barracks longer than their physical needs require. Moreover, during convalescence they should have an opportunity to reassume civilian habits of life; they should not become "hospitalized," and unnecessary restriction would in many cases undoubtedly have an evil effect on recuperation.

For these reasons, then, an outpatient service should be available, with opportunity for successive or recurrent treatment as indicated. Often such a need will occur unexpectedly and long after the military hospital has ceased to exist. All these difficulties are successfully met by recourse to an established hospital in the vicinity of residence. Also many hospitals maintain in themselves, or with affiliations, a follow up system which will operate efficiently if the patient is brought within its sphere. Thus again the use of existing hospitals is indicated as the solution of a very definite problem.

CONCLUSIONS.

In this exigency men have been forced into a condition of life entirely contrary to their habits and inclinations. Many have been so compelled by patriotism, some by governmental authority. In either case they eagerly anticipate a return to the environment of family, friends, and freedom from military control. They are entitled to this as soon as may be after their work is finished, and unnecessary separation from their homes should be avoided. The establishment of a multitude of military

hospitals, so that a large proportion of the men could be brought in touch with their families and accustomed relations, is impossible, but by the wise use of the many and widely spread general hospitals the desired result may be approached if not attained.

All other considerations lead to the same conclusion, not even eliminating the only objection which has been advanced, namely, the need of full military control for disciplinary purposes, for it is believed that discontent arising from unnatural and restrictive conditions will provoke more disregard for authority than the show of official supervision will restrain. The word "blighty" is familiar even in this country. It expresses the eagerness of the soldier for his home and for friendly sympathy. A "blighty" for our men means a serious injury, and the man who has such should not be held in a hospital in New York when he lives in Chicago, unless his personal safety requires it. He should have all the possible privileges of his most honorable condition and not be debarred therefrom for the sake of discipline or in order that proper military records may be easily made.

The following is suggested as a skeleton of a possible solution of the problem.

1. Establish military hospital zones or districts, each with the necessary number of beds for proper military administration, such zones to consist of a single hospital, a group of hospitals in a city, or a similar group in neighboring cities easily accessible.

2. To each zone assign the requisite military officers and men.

3. Designate hospitals in each zone as military hospitals, this to apply to consumptive, insane, eye, and other hospitals when feasible. Each military hospital should conform to certain requirements, including compensation, provision of necessary bed space by assignment of existing wards for the sole use of military patients, or the construction of additional temporary wards to remain the property of the army; an undertaking to conform with necessary military requirements and a sufficient number of members of the Auxiliary Medical Reserve Corps, either permanently or temporarily on the staff of the hospital, should be provided to care for the men properly. The hospital should be at all times subject to the inspection of military officers as far as the wards and other facilities used for military purposes may be concerned.

4. For the purpose of carrying out the above, and in fact to coordinate all departments of hospital service as distinct from medical service, form a hospital department under the Surgeon General with a chief and staff made up of men familiar with hospital needs and the necessary additional personnel for examinations, inspections, and planning of hospitals used, or tendered for use, as military hospitals. In connection with this surgeons and physicians of eminence, leaders in the nursing profession, dietitians, etc., might be appointed as consultants, to bring the standard of practice in all military hospitals to a high level.

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INTRAPULMONARY WOUNDS FROM PROJECTILES.

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REACTIONS AND SYMPTOMS.

I propose in this communication to discuss the subject of intrapulmonary wounds from projectiles of war because the treatment, after three years' experience, has now become fairly well outlined. The first point which impresses one in thoracic wounds of warfare is the usual tolerance of the pulmonary parenchyma toward the projectile embedded in it when once the inflammatory storm following the pulmonary trauma has subsided. For example, a penetrating wound of the chest by an S bullet lodged in the lung will generally give rise to a temporary and very mild pulmonary reaction. In other cases the bullet or bit of exploded shell—the larger number of projectiles transpire the chest—are quite similar in gravity to transfixing thoracic wounds and complications are not more frequent.

A still more important question is that of normal and curable accidents arising in every case of pulmonary wound. What is especially important is that the surgeon shall be familiar with the symptoms and lesions present in almost all cases of penetrating chest wounds, so that he will not look upon the case as one with complications and interfere surgically when, in reality, the patient offers simply the ordinary syndrome arising in the evolution of these wounds. If I insist upon this point, it is merely because certain papers on the extraction of intrapulmonary wounds in warfare have maintained that a pulmonary congestion or a pleural collection are indications for operation.

Now, every penetrating wound of the chest, with or without fixation of the projectile in the pulmonary parenchyma, is accompanied by a curable syndrome that Piéry has called the hemopleuropneumonic syndrome, which is characterized by a focus of pneumonia accompanied by a hemothorax. This syndrome is manifested by the following physical signs: a tubal murmur in the median area; dullness and obscure breathing at the base; a radioscopic picture showing a shadow progressively decreasing in the deepness of the shadow from the base toward the apex; and last, an intrapleural collection of blood revealed by exploratory puncture. The functional and general signs are not less characteristic: hemoptyses, which must be distinguished from the primary type due to hemorrhagic pneumonia; sudden dyspnea soon decreasing in intensity; above all, a progressively rising temperature exactly typical of the pneumonic process which it faithfully interprets; and the relapses and a frequently prolonged evolution of the pulmonary process. The surgeon must beware of this very frequent relapse, likewise the fact that resolution is always slow, while the same applies to absorption of the hemothorax.

Given these conditions, patient waiting with careful observation of the case is in order. I would point out that these subintract attacks of pneumonia

at length disappear spontaneously, unless of course, they become complicated by a pyothorax. These are quite sufficient reasons for the surgeon not to attribute the hemopleuropneumonic syndrome to a projectile embedded in the pulmonary parenchyma, although its presence is made evident by radiography, and also not to look upon a relapsing pulmonary congestion as an indication for surgical interference.

Aside from the inflammatory reaction common to any penetrating thoracic wound and those cases of perfect tolerance of the projectile by the lung, intrapulmonary retention of a foreign body may very well set up a long series of accidents, such as infection, hemorrhage, dyspnea, pain, and tachycardia. In the first place it is quite prone to give rise to a large variety of pleuropulmonary infectious processes which complicate the evolution of thoracic wounds, namely, persistent empyema, pulmonary abscess, or even certain specific infections, as gas gangrene and tetanus. These infections are a menace to the patient's life.

In the suppurative complications, mediastinal and intrapulmonary abscesses must not be overlooked. The prognosis of the former is very serious; those of the lung less so. If, however, the intrapulmonary abscess burrows toward the surface it may infect the pleural cavity, in which case the prognosis will be governed by the total or limited extension of the process to the pleural serosa. Acute general empyema may take place but is rather exceptional; in the larger number of cases one may meet with one or two morbid processes, namely, either the septic accidents become localized, undoubtedly around the infecting projectile, and undergo the evolution of a pleuropulmonary abscess terminating in a vomica or by a spontaneous evacuation through the entrance wound of the projectile, this being followed by recovery. On the other hand, the phenomena of hyperplastic pleurisy may manifest themselves, resulting in the walling off of several collections one above the other, some being serohematic, others purulent in nature. In cases of this kind, auscultation is negative in results, or nearly so. Alone, an examination of the thorax and its partial deformity, aided by radioscopy and exploratory puncture, will give an idea of the pleuropulmonary topography which is constantly undergoing changes.

Intrapulmonary abscesses are usually made known by a purulent expectoration, a slight vomica, while there is usually a rise of temperature. Late in the process one detects the abscess by radioscopy after a partial resolution of the hemothorax and pneumonic process has taken place, but if these intrapulmonary pus collections were systematically searched for in every case they would not be discovered only at operation. The repeated hemoptyses, composed of pure blood and not hematopoietic expectoration characteristic of a pulmonic process, occur for weeks and after all the dangers inherent to serious loss of blood. In a case observed, the patient had expectorated blood for seven months. Late hemoptysis is to be feared, especially when the projectile is irregular in shape. The foreign body, from the constant movement of the lung, may wound the walls of an important vessel or secondary ulceration

may ensue from extension of the necrotic process around the projectile. Instances of very severe pulmonary hemorrhage arising from this cause have been met with.

In a subject harboring an intrapulmonary projectile a series of functional symptoms may be observed which will prevent his return to his usual occupation. First, there may be a local persistent thoracic pain or deep seated pain, which palpation reveals to be a parietal painful area whose site is not always related to the intrapulmonary location of the projectile. Sometimes there is dyspnea with short breathing when the patient goes upstairs or walks briskly; tachycardia has been also met with. Finally, by radioscopic examination, even when the pulmonary parenchyma surrounding the projectile appears normal and not adherent to the thorax, pulmonary ampliation is less marked on this side and the movements of the diaphragm less extended.

Consequently, infectious processes, pulmonary abscesses, repeated hemoptyses, late hemoptyses from ruptured bloodvessel, functional disturbances of various kinds may result from the presence of an intrapulmonary projectile and may most likely require surgical interference, the exact operative indications thereof I shall discuss later.

INDICATIONS FOR OPERATION.

From the clinical facts put forward in the foregoing, as well as from the complications which exist or may ultimately ensue, from the presence of a projectile embedded in the pulmonary parenchyma, it is now possible to lay down the indications for the operative removal of such foreign bodies. Let me say at once that these interferences are not so simple that one may resort to the removal of intrapulmonary missiles lightly. It is by far the best practice to wait until a real operative indication offers itself, that is to say, the advent of some complication.

The infectious process complicating chest injuries, as well as the specific infections—gas gangrene and tetanus—are evidently distinct indications for the removal of the foreign body. Tetanus, particularly the chronic type, requires surgical interference most urgently. For example, a soldier received an intrathoracic injury from an exploding shell and two weeks after symptoms of chronic late tetanus developed, which continued for nearly three months without manifesting any evidence of regression from the exhibition of any of the treatments used. The only treatment which did away with all the trouble was the surgical removal of the intrapulmonary foreign body. The patient then recovered.

In cases in which a pulmonary abscess remains encysted around the missile or opens through the chest wall, surgical interference is absolutely necessary. Projectiles setting up suppuration in the entrance wound require extraction; on this point no discussion is necessary. Such cases are bad from the start, but when the missile has been removed, recovery is surprisingly prompt. The abscess can only be detected by radioscopy in most cases.

Besides the infectious complications, the most urgent indication for operating is unquestionably hemoptysis. Of course I only refer to hemoptysis of pure extravasated blood and not to hematopoietic

sputum, which simply is an indication of a pneumonic process taking place. Surgical interference is to be resorted to when bloody sputum is constant and in small repeated quantities occurring for several months following the injury. These should put the surgeon on his guard and suggest the probable occurrence of a serious hemorrhage if operation is not resorted to; after operation all will quiet down, and recovery takes place.

These remarks are not theoretical but are based on a number of clinical observations. As to Duval's syndrome, namely, dyspnea, tachycardia, thoracic pain, and diminution of pulmonary expansion, it is merely a relative indication when taken in relation with the intensity of the symptoms present, as well as the more or less distinct impediment to return to service, active or otherwise. When symptoms persist after the lapse of several months and attain such intensity that they prevent the subject from returning to his daily occupation or going back to his unit, operation is of urgent need, but on the other hand, if one resorts to watchful waiting, very frequently these divers symptoms regress and the subject may be able to return to service although he still is the possessor of his intrapulmonary projectile. All this is a matter of surgical tact, acquired only by considerable experience in the surgery of warfare.

I have read with no little surprise certain remarks made at the recent meeting of the Clinical Congress of Surgeons of North America. For example, a certain speaker "had spent five months in France and England and every man over there was infected." That speaker should return to France and if he keeps his eyes open he will find that such is not the case. Infection goes hand in hand with each and every projectile, no matter what its nature, but it would be easy to show that in a good number of cases there is no resulting infection, thanks to the methods employed for its prevention, which, undoubtedly have escaped this speaker's observation of five months' duration. Such statements merely show that the pathology of the surgery of warfare does not form a part of the scientific equipment of the person who utters them. This applies particularly to intrapulmonary lesions, among a host of others. Let us return to our mutton.

There are other considerations to be taken into account when making a decision; I refer to the shape of the missile, their number, and the depth they occupy in the pulmonary parenchyma. I shall also indicate the time which appears the most propitious for the interference. I am here prepared to say that the size and irregular surface of the projectile are serious points in favor of surgical interference and that pieces of an exploded shell are of more importance from the viewpoint of surgery than rifle or shrapnel bullets. A bursting shell, the bits of which carry along pieces of clothing into the wound, might at first appear to be more prone to result in septic accidents, but paradoxical as it may seem, certain experienced observers, Piéry, among others, have noted that shell wounds do not offer more serious conditions than bullet wounds in the cases under consideration.

The depth of the missile in the pulmonary parenchyma is of considerable importance and some

surgeons are of the opinion that it is better not to interfere when the projectile is deeply situated in the lung. In these circumstances the foreign body is close to the vessels of the hilum and therefore the operative risk is considerable, but such cases are few because such wounds are usually fatal and death occurs on the battlefield.

As to multiple projectiles lodged in the lung it can be said that these offer a contraindication to surgical interference if they give rise to few symptoms. They cause both a diagnostic and technical difficulty if the patient must be operated on for accidents arising from one or several of the embedded missiles. In one case reported, a German lieutenant recovered perfectly with five pieces of shell in his lung, and other similar instances are on record. In case of infection from the missiles, the difficulty arises in deciding which one of them is giving rise to the trouble. The functional symptoms and radiography are usually sufficient to lead to a correct diagnosis, so that *a priori*, the multiplicity of the missiles would seem to be a contraindication to surgical interference unless serious complications ensue. On the other hand, the existence of a pneumonic process, even when prolonged and relapsing, is in no way an indication for operating. It can even be said that until this traumatic pneumonia has undergone resolution it is a decided contraindication for surgical interference.

It is far better practice to delay operation as long as possible after resolution of the hemopleuropneumonic syndrome and, as in appendicitis, operate when the inflammatory process has quieted down, unless, as in the case of appendicitis, the surgeon is forced to interfere on account of some intercurrent complication. Finally, it is an unquestionable fact that in the various penetrating wounds of the thorax offering the hemopleuropneumonic syndrome, any pleural surgical interference, such as simple pleurotomy for hemothorax or removal of a missile from the thoracic wall necessitating opening of the pleura, produces with the utmost ease the transformation of a hemothorax, usually quite inoffensive in itself, into a severe grade empyema. The most successful removal of missiles have been in cases of long standing when all acute inflammation has subsided.

DIFFICULTIES AND ACCIDENTS OCCURRING IN PULMONARY SURGICAL INTERFERENCE.

Abstention from any surgical interference in cases of intrapulmonary foreign bodies was formerly the rule and the same applies to wounds of the lung, but even before the advent of the war the surgery of the heart and concomitant wounds of the lung had begun to progress, particularly from the impulse given by the Italian surgeons in the case of cardiac wounds. Regardless of the advance made, I think it may be said in all fairness that immobilization of the thorax and operative abstention was still the rule followed in pulmonary wounds by most surgeons throughout the world. Immediate interference was resorted to in certain circumstances, such, for example, as very serious hemorrhage which was not controlled by absolute rest. Operation was also done when a wound of the lung accompanied a wound of the heart or abdomen.

Regardless of these various isolated efforts there was yet great dread among operators to open up the pleura and as a proof of this we have only to turn to Sauerbrück's complicated apparatus for pulmonary work, which from our present knowledge acquired during the past three years will, if it has not already, fall into oblivion, as well as other similar devices. Operative pneumothorax was the bugbear of the surgeon, but many operators, among others Buzy, Macewin, Delagenière, and the writer, had maintained that even total pneumothorax is not dangerous when it is slowly produced and not kept up for too long a time.

Many lung operations which have been done during the war tend to show the innocuity of operative pneumothorax although some deaths apparently of nervous origin demonstrate that the procedure is not devoid of danger. The pathogenesis of death in these cases is still obscure although some writers believe that certain mild accidents of a transitory nature, such as syncope, paralyzes, or convulsive paroxysms, are due to pleural reflex resulting in a spasm of the cerebral arteries with transitory ischemia, while the serious accidents usually ending in death, such as coma with convulsions or syncope, result from complete and permanent occlusion of the cerebral arteries by gas emboli.

However this may be, an excellent prophylactic measure against reflex nervous accidents is a hypodermic of 0.25 grain of morphine given thirty minutes before the operation. Atropine sulphate one mgm. is advised by those who believe that the accidents caused by pneumothorax are due to the sudden entrance of air into the pleura which causes cardiac reflex. The drug acts on the vagi by decreasing the inhibitory power. Finally, some operators believe that the immediate accidents of pneumothorax result from the sudden inlet of air alone which compresses the mediastinum and thus compromises the free play of the opposite lung. One of the best means of avoiding total pneumothorax is immediately to pull the lung into the thoracic incision and should always be done.

Whatever may be the exact pathogenesis of the unfortunate accidents due to pneumothorax one thing is certain, namely, that generally speaking they are the exception and should not stand in the way of any operations necessitated by well defined symptoms requiring surgical relief.

Röntgenologists Progressing Rapidly in War Work.—Major James T. Case, returned from his work with the American expeditionary force, expressed his satisfaction at the progress made by the röntgenologists of America at a joint meeting of the Philadelphia Medical Society and the Philadelphia Röntgen Ray Society, December 12, 1917. He had found that the needs emphasized by his work in France had been met beyond his expectation. The *Manual of X Ray Work* was as nearly ideal as could be attained. The relationship between the röntgenologist and the surgeon brought about by the war had made possible a very admirable type of team work. Such adaptation of röntgenology to medical cases he thought would also be brought about.

MEDICAL NEWS FROM WASHINGTON.

Accommodations Needed in Training Camps for Enlisted Personnel of Medical Department.—House and Senate Bills Affecting Medical Department.—Medical Director Braisted Redetailed as Surgeon General of the Navy.—Inspection of the Naval Training Station at Great Lakes, Ill.—Amendment of Resolution on Notification of Relatives in Case of Soldiers' Injury or Disease.—Gas Masks for Overseas Forces.

WASHINGTON, D. C., February 18, 1918.

Major General William C. Gorgas, surgeon general of the army, has called the attention of the Secretary of War to the fact that the Medical Department now lacks accommodations at medical training camps for 9,000 men of the enlisted force of the department, which originally were asked for. A recent request for tentage for these men has been disapproved, and the camps for training enlisted personnel of the Medical Department at Fort Benjamin Harrison, Ind., and Fort Des Moines, Iowa, have been discontinued. Orders were issued for discontinuance of that at Fort Riley, Kans., but this order was revoked after appeals made by the surgeon general. In the meantime, it has been ascertained that 10,000 of the second draft will be assigned to the Medical Department, and it is not possible to accommodate more than 2,000 of this number at the training camps, although the entire number allotted will be needed by the department. The present situation is that untrained men have had to be sent directly to hospitals and other organizations not adequately prepared to train them. The past shortages of the department have been added to its present deficiencies, and these, with prospective needs created by plans of General Pershing for taking care of sick and wounded in France, produce a problem in medical training, organization, and preparedness not solvable by present facilities. Every month of delay in satisfying the needs has seen the burden grow heavier. It is estimated that the Medical Department needs approximately 135,000 men. It takes two months at the minimum to train a man of the Medical Department. All of this number should be trained in the next six months to be of any material use in the military operations of this year. Allowing for all possible numbers directly absorbable into hospitals and divisions, nothing less than all the accommodations at Chickamauga Park, Ga., with those now available at the medical officers' training camp at Fort Riley, Kans., can even approximate the meeting of the demands. New camps cannot be established at other places, for the reason that no instructors, equipment, and material are available, but great expansion of the present nucleus and administrative and teaching staff at Chickamauga is possible and furnishes the only solution.

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A bill, containing many important provisions affecting the Medical Department of the army, has been introduced in the House by Representative Hicks. It provides, among other things, that the Medical Department of the army shall consist of one surgeon general with the rank of major general, who shall be chief of the department; assistant surgeons general in the ratio of 0.5 per cent. of the total number of officers of the Medical Corps, to be equally distributed in the grades of major

general and brigadier general; the Medical Corps; the Medical Reserve Corps; the Dental Corps; the Dental Reserve Corps; the Veterinary Corps; the Veterinary Reserve Corps; the Nurse Corps; contract surgeons as now authorized by law; the enlisted force of the Medical Department of the army, and the medical enlisted reserve corps as now provided by law. Under the terms of the bill, when the army is engaged in active military operations in time of war, the transportation necessary to convey medical and hospital stores and supplies of all kinds and the sick and wounded of the army, whether by land or water, shall be under control of the Medical Corps.

One section of the bill contemplates the establishment of a department of pharmacy, with a commissioned officer of the rank of colonel at the head, and with such number of commissioned subordinates with the rank of major, captain, and lieutenant, as may be determined by the chief of the Medical Department and the Secretary of War, all of whom must be graduates of some recognized college of pharmacy. The department of pharmacy would be charged with the purchase and distribution of all medical and hospital supplies, the care, preservation, and preparation of medicine, dressings, books, and appliances, and the sterilization and care of all instruments, and with the clerical work, the maintenance of records and correspondence relating to hospitals and their inmates, the rendering of returns, reports, and records pertaining to the sick and wounded.

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Considerable attention has been attracted to a bill, recently introduced in the House by Representative Dyer and bearing some similarity to that introduced by Representative Hicks, in its relation to the Medical Department of the army. The Dyer bill seeks to amend the national defense act of 1916, and it is understood to have been suggested by Dr. Franklin H. Martin, chairman of the general medical board of the Council of National Defense. The bill provides that the army Medical Department shall consist of one surgeon general with the rank of major general, who shall be chief of the department; assistant surgeons general in the ratio of 0.5 per cent. of the total number of officers of the Medical Corps provided by law, the assistant surgeons general to be distributed equally in the grades of major general and brigadier general, and the Medical Corps, officers' reserve corps, etc., as now provided by law. The bill also provides: "That hereafter the President shall be authorized to fill any vacancies that may occur in the commissioned personnel of the medical department of the army of the United States by ordering such officers of the medical section, officers' reserve corps, who shall have been in active service one year or more, to the Army Medical School, under such rules and regulations as may be prescribed by the Secretary of War, and such officers so ordered, upon completion and satisfactory examination, shall be commissioned in the medical corps, United States Army, and be entitled to all the pay, promotion, and allowances of officers of like rank in the army of the United States," etc.

If the bill is enacted without amendment, some

of the assistant surgeons general would have rank equal to the head of the Medical Department, and might even possess prior date of commissions. It is the evident purpose of the bill to make medical reservists, without regard to rank as such, eligible to appointment as assistant surgeons general, although there is uncertainty in the phraseology, which provides that these officers, after the prescribed qualification, "shall be commissioned in the medical corps," whereas the surgeon general and assistant surgeons general are not, according to the terms of the bill, of the "Medical Corps," but distinctly a part of the "Medical Department."

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Other bills have been introduced in the House and Senate providing "that the commissioned officers of the Medical Corps and of the Medical Reserve Corps of the United States Army on active duty shall be distributed in the several grades in the same ratio heretofore established by law in the Medical Corps of the United States Navy. The Surgeon General shall have authority to designate as 'consultants' officers of either corps and relieve them as the interests of the service may require."

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General approval is expressed in the naval service, and particularly in the Medical Department, over the redetail of Medical Director William C. Braisted for another four year term as surgeon general of the navy, since he has demonstrated such efficiency during these trying times and the Bureau of Medicine and Surgery under his direction has made such an excellent record under the conditions imposed by war. During the past year, the Medical Corps has grown from a personnel of 320 officers to 1,950. The Hospital Corps has increased from about 1,600 to over 8,000; the Dental Corps from thirty to 308, and the navy Nurse Corps from 140 to 850, most of this increase having been since our entry into the war. The large and rapid growth of the navy's personnel imposed unprecedented burdens upon the Medical Department, and necessitated a corresponding enlargement of hospital facilities, which have been increased from 2,000 to 8,000 beds, with further increases provided for. The standardized units adopted for temporary construction and the policy of detention and segregation have proved notably successful in the prevention and eradication of disease in training camps. In spite of outbreaks of communicable disease that are inevitable when large numbers of recruits are gathered in camps, the health of the navy, as a whole, has been remarkably good, and this, in a large measure, is due to the excellent work of the Medical Department, which has met every demand promptly and efficiently.

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Medical Director E. R. Stitt and Surgeon J. R. Phelps, of the navy, recently made an inspection of the naval training station at Great Lakes, Ill., and the health conditions were found to be excellent. The increase of disease among the personnel, which was incident to the sudden expansion of the recruit element, has entirely subsided, and the men were found to be in excellent health. During the

navy recruiting campaign in December, the number of recruits at the station was increased more than 10,000, and before all the new men could be broken in and accustomed to their new surroundings the station was visited by a blizzard, which entailed a great deal of extra duty and exposure.

* * * * *

The House joint resolution relating to notification of relatives of soldiers' injury or disease has been reported favorably, amended to read as follows: "That in all cases where an enlisted man or officer of the army is admitted to an army hospital in continental America on account of a dangerous injury or disease, and in all cases of admission for slight illness or injury and the same becomes dangerous after such admission, immediate notice shall be given to the nearest relative of such enlisted man or officer, under such rules and regulations as the Secretary of War may prescribe." The committee felt that the purpose of the resolution was to require immediate notice to the nearest relative of an enlisted man or officer in case of serious injury or illness upon his admission to an army hospital, but the language of the resolution as originally drawn would require immediate notice by telegraph in all cases of admission to a hospital, whether the soldiers' condition was slight, serious, or critical. This, the committee thought, would be unwise and unnecessary in the case of slight injury or illness. The committee also thought that the manner of communicating the notice should not be specified, but that all means of communication should be utilized.

* * * * *

Contracts have been placed by the War Department for 2,500,000 gas masks, and additional orders to a much larger extent are in contemplation to fill the needs of the overseas forces. The fabric of the face piece must be contracted for three months before deliveries may be made. Last summer, under the supervision of the Bureau of Mines, 20,000 masks were made and shipped abroad. By the time they reached France it was found that, while they were better than the masks the French then were using and now are using in some quantities, the British had improved upon the masks. Consequently, ours were returned to this country, and we then entered upon a period of development to make something equal to or superior to anything of the kind in use up to that time. Major Bradley Dewey, of the Sanitary Corps of the national army, was assigned to special duty in connection with the gas mask development, and he had much to do with the improvements that have been made. We have been manufacturing gradually for the training camps in this country, where it is essential that our troops be trained in the use of the masks, the troops on the other side having been provided for by the British by outright sale to our forces. We now are making and shipping masks to General Pershing at the rate of about 4,000 a day, and shortly the output will reach a rate of about 5,500 a day. It is expected that within a few weeks a new plant will be in operation, and that by that time the combined output of all plants will be at the rate of about 20,000 a day.

Editorial Notes and Comments

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A Weekly Review of Medicine

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VASSAR'S PLATTSBURG.

A new branch of war service claims the interest of the medical profession. Even as the latter came into close and active contact with the intensive training of army officers during the summer months last year, so is this new project entitled to receive the hearty cooperation of physicians, for it constitutes that right arm of medical service, trained nursing. The practical and far reaching scope of the enterprise must recommend itself to every physician who looks for the successful conduct of the medical side of the war and the supply of efficient executive nurses which this involves, as well as for the great work of reconstruction of health and continuation of public welfare work in times of future peace.

Certain Vassar trustees, with the coöperation of the president of the college, have been conferring with the Committee of National Defense, in order to determine just where and how the vast resources of this oldest of women's colleges, with its active body of alumnae, as well as those of other colleges, could best be placed to count

in the work before the nation. The result of the conference was the proposal and, already, the partial establishment of an intensive training school for nurses to be maintained upon the Vassar campus for twelve weeks during the summer months. A faculty has been chosen representing the most advanced research and the best executive ability in the departments which pertain to the theory of nursing. These instructors will come from Johns Hopkins, Yale, Columbia, Vassar itself, and other centres of scientific advance, and their work will be to give to a chosen group of women as much theoretical training as possible during the twelve weeks in a place specially equipped for such work. The buildings of the college will be at the students' disposal, and arrangements are being made for a theoretical demonstration ward and the loan to the already well stocked college library of a special medical group of books.

The students are to be recruited from all the leading women's colleges and universities of the nation. Candidates are eligible from the classes graduated from 1918 inclusive, ten years back, thus limiting this work to those best fitted in age. The theoretical work of the summer is to be followed up by thorough training in hospitals, which are heartily coöperating, the training to be reduced to two years because of the intensive preparation of the summer and also because of the mental equipment and discipline which the college woman brings to her task. It is a matter for special note that this is the first extensive educational movement to receive the endorsement and support of the Government. It is fully recognized by the Medical Council of the Committee of National Defense, and the sum of \$75,000 to inaugurate the work has been voted through the Government's auxiliary, the Red Cross Society. This money has been appropriated not from war funds but from the general endowment of the Red Cross.

The aim of the promoters of this enterprise is not so much to meet the primary needs of the war as to build for the far future upon the basis of these needs. They have reckoned closely on the numbers of nurses who are to be withdrawn to service abroad with our own men. They foresee even the possibility of a need to complete the training, upon which these students embark, in the military hospitals in foreign lands. They realize, however, still more the importance of filling the places left vacant here with college women, women fitted by their double training to

constitute an officers' corps in the work of public welfare, which is being multiplied into many fields. They know the need of such fitness for hospital management and training school superintendency. They know also that France as well as other nations abroad have recognized the need for well trained nurses and that America will be called upon after the war to help them to a state of preparedness in the nursing field which was not theirs at the beginning of this war.

Not the least important service will be the realization of college women themselves that nursing presents expansive opportunities for public service and individual interest and advantage. A new interest and stimulus will accrue to the nursing profession and new breadth to the college woman's career. The profession of nursing, particularly as it enlists the best material for training and thus obtains the best equipment, is a limitless profession, always able to reach out and occupy new territory for its ranks. This movement justifies therefore to the fullest extent both medical interest and medical support.

THE DISASTER AT HALIFAX.

On behalf of the Canadian medical profession, especially that portion of it in the maritime provinces of Canada, the *Canadian Medical Association Journal*, in its January issue, makes due acknowledgment to the "prompt and exceedingly efficient response" of the United States to the cry of distress from Halifax on the sixth of December last; and it is understood that the visiting American surgeons who were privileged to take part in the medical relief of that sorely stricken city have paid their due tribute of appreciation, not only to the medical profession of Halifax and the surrounding country, but as well to the nurses of the Canadian Army Medical Corps and the V. A. D. nurses, and to the women possessing certificates of the St. John's Ambulance Association. It is a pleasure to record this mutual admiration and respect.

No sooner had the reverberations of the terrific explosion died away than the offices of the physicians and surgeons of Halifax became glutted with persons seeking surgical and medical relief. The work at the various hospitals became enormous. Motor cars were bringing patients from all directions and in ever increasing numbers. There were a large number of scalp and eye wounds, as also of compound fractures and cranial depressions. Broken glass was responsible for many wounds, but falling wreckage counted as well for many severe injuries.

These were often as many as twenty on the body of one person. Many were stricken blind and burns were extremely common. Many wounds subsequently became septic, but so far as can be learned there was only one case of tetanus, readily kept under subjection by antitetanic serum.

The whole hearted response of United States surgeons has been tabulated as follows: The Massachusetts State Guard from Boston, with a personnel of thirty-two commanded by Major Harold J. Gidding, was assigned to the building known as Bellevue, once the residence of the general commanding the Halifax garrison. Dr. E. A. Codman's private hospital staff from Boston comprised fourteen persons and was sent to the Y. M. C. A. Building, which had been rapidly transformed into a hospital. The American Red Cross Unit from Providence, R. I., made up of 107 persons commanded by Major G. de N. Hough, worked at first in the Halifax Infirmary and later at Bellevue. The American Red Cross Unit (Boston) No. 5, consisting of 105 persons in charge of Dr. W. E. Ladd and Mr. Samuel L. N. Wolcott, American Red Cross, went to St. Mary's College, a Roman Catholic institution hurriedly transformed into an emergency hospital. The State of Maine medical unit, consisting of twenty-four persons commanded by Major Gilbert M. Elliott, went to the Halifax Ladies' College, which had also been given over as a hospital. The Calais Chapter of the American Red Cross from Calais, with a personnel of twelve under command of Dr. William Miner and the Rev. R. A. Macdonald, worked chiefly at relief dressing stations No. 1 and No. 2.

The Canadian journal states that it is absolutely impossible to do justice to all who participated in the work of relief, but mentions the excellent work of Doctor Cox, of New Glasgow, on eye injuries; of Captain Goodman, of the United States Army; of Lieutenant Colonel McKelvey Bell, A. D. M. S., of the Sixth Canadian Military District; and of Lieutenant Colonel Paul Weatherbee, and Captain W. H. Hattie, chief medical officer of public health of Nova Scotia, both of whom gave a great deal of time to medical relief. Dalhousie University, which is situated in Halifax, suffered greatly. With a terrible roar every window of the medical building was smashed in upon the classes which had just assembled; but the laboratories were the chief sufferers, particularly those of physiological chemistry, histology, and biology. There conditions are said to baffle description, but it is understood teaching was resumed shortly after the New Year.

It will probably not be until the official publication of the history of the medical aspect of the disaster, which is in charge of Professor Fraser Harris, that an adequate conception of the devastation at Halifax will be available and of the complete and masterful handling of the medical relief by American and Canadian surgeons working side by side in the common interests of a portion of suffering humanity.

ENDEMIC AND EPIDEMIC MENINGOCOCCI.

Nearly twenty years ago Still first noticed that an organism, apparently the meningococcus, which he isolated from cases of posterior basal meningitis of infants, differed somewhat from the organism originally described by Weichselbaum eleven years earlier. The difference lay in a greater vitality of Still's organism on culture mediums. Subsequently Kutscher and others were able to demonstrate serological differences among different strains of meningococci, and in 1909 Dopter first attempted a classification of meningococci. At the outbreak of the war it was recognized that the causal agents of epidemic cerebrospinal meningitis and the endemic posterior basal meningitis were identical culturally and for the most part serologically; that meningococci could be divided serologically into more or less definite subgroups, belonging to two main divisions—meningococci and parameningococci of Dopter; and that the pharyngeal mucus of contacts and noncontacts contained meningococci, some of which agreed in biological characteristics with those of the usual strains, others of which could not be placed serologically. The latter were called pseudomeningococci.

The assumption of epidemic proportions by meningitis among the British troops and an increase of the disease in the civil population led to the establishment of two separate commissions for the investigation of the disease, the one military, the other civil. The work of both these commissions was painstaking and thorough, both having sought to study especially the variations in the strains of the organisms. The military body dealt only with the disease in its epidemic form, the civil with the disease in its potential form, that is, with the occurrence of meningococci in the throats of unselected members of the community, and of contacts. The results of the two investigations led to views apparently divergent, but, as shown by F. W. Andrews [*Lancet*, December 8, 1917], the two can be reconciled with the result that a working hypothesis of material value can be established.

He suggests that the meningococcus is a single, definite species which can be recognized by its cultural characters and fermentive reactions. In its most primitive form it is relatively harmless, but even in that form its protein can be shown to have two distinct antigenic components, unevenly balanced, and determinable by serological reactions. Owing to the uneven balance in these two components two primary races of meningococci can be recognized, corresponding to the meningococcus and the parameningococcus, both, however, being true meningococci. The great majority of the saprophytic throat meningococci fall into Group II and are of the low type. Some of these organisms, however, even in nonepidemic times, are sufficiently virulent to cause disease in the very susceptible and account for the endemic basal form of childhood. At times certain strains of both groups increase in virulence and at the same time develop an increased complexity in the structure of their antigenic components so that several slightly different strains can be recognized in each of the two main groups. This change is more marked in Group I than in Group II. When the disease becomes truly epidemic the virulent strains come to stand out with greater relative clarity so that they can be readily recognized.

Such observations as these, if confirmed, should prove of the greatest value, for they would make it a relatively simple matter to distinguish the carriers of the virulent epidemic from those of the relatively harmless endemic types. They would also be most valuable in the selection of strains for the preparation of therapeutic serums.

A NEW HYPOTHESIS CONCERNING TRAUMATIC SHOCK.

When Crile propounded his theory of surgical shock it was accepted at once. It explained the phenomena observed satisfactorily, and it was presented convincingly. War is the great iconoclast. Accepted views give way, new laws are discovered, and theory and practice are overturned. Now comes Dr. Henry Townsend Porter, the physiologist, with a new, a simple, and a still more satisfactory theory of surgical shock which promises to dispose of Crile's theory as effectively as did Crile's theory of those hitherto accepted.

Was it possible, asked Doctor Porter, that the unprecedented violence of the bombardments of the present war predisposed the wounded to surgical shock? If so, the characteristic lower-

ing of the blood pressure would occur very soon after the wound was received. To study this phase of the question the Rockefeller Institute sent Doctor Porter to the front line trenches in France, where he could see many severely wounded and measure their blood pressure immediately. He found there was no predisposition toward surgical shock produced by life in the trenches.

His first visit to France taught Doctor Porter that shock was most frequent in patients with a fracture of the femur and those with multiple wounds through fatty tissue. Laboratory studies seemed to prove that it was the presence of fats absorbed into the circulation that caused traumatic shock by producing fatty embolism in the smaller capillaries. If the circulation could be stimulated, these embolisms might be overcome and the blood made to flow back into the heart, where it was needed, from the veins in which it was dammed up by the globules of fat. He accomplished this by increasing the force and frequency of the respiration, stimulating the "respiratory pump." This he did by substituting carbon dioxide for a portion of the air inhaled by the patient. The labored breathing thus induced in most cases sufficed to overcome the impediment to the circulation, the blood flowed back from the veins into the heart, and the patient recovered from the shock.

All this was told in the Harvey lecture delivered at the Academy of Medicine and printed in abstract in the *NEW YORK MEDICAL JOURNAL* for November 10, 1917. It constitutes one of the most interesting and valuable of America's contributions to the surgery of the war. The story has again been told by Doctor Porter in a popular manner in a book recently published under the title *Shock at the Front*, which, incidentally, paints a graphic picture of war as seen by the surgeon. One only regrets that the author did not expand the volume to larger proportions and particularly that he did not tell more of Doctor De Page and his great hospital at La Panne, where Doctor Porter worked for several weeks.

MILITARY HOSPITAL SERVICE DURING THE REVOLUTION.

The first draft of a plan for the organization of a military hospital service during the Revolution was drawn up by Dr. William Shippen, of Philadelphia, with the cooperation of John Cochran. It was written out in Shippen's own handwriting and transmitted to Congress on February 14, 1777. The committee report on this proposal in the handwriting of Dr. Benjamin Rush was submitted to Congress on February 27, 1777. In addition to

providing for director generals for each of the northern, middle, and southern districts proposed, and their assistants, the plan provides for an apothecary general, "whose duty it is receive, prepare & deliver medicines & other articles of his department to the Hospital & ye Army as shall be ordered by ye Director General. Apothecary and mates to obey ye Apothecary General." It is interesting to note that the first draft of a plan for the organization of a military hospital, as far back as 1777, provided for an apothecary general and mates, but that we are now without these officials or their equivalents in the service. There are now before Congress three bills providing for the organization of a pharmaceutical corps in the Medical Department and the Surgeon General has appointed a committee to consider the proposal for establishing such a corps. The project has received the endorsement of the medical press generally and it is interesting to see that as far back as 1777 a similar proposal emanated from so distinguished a physician as Dr. William Shippen. The text of the draft, furnished by Colonel William A. Owen, curator of the Army Museum at Washington, is printed in *The Annals of Medical History*, vol. i, No. 2, together with a facsimile reproduction of a page of the manuscript which provided for "the flying hospital," the precursor of our present field hospital. That the value of the female nurse was appreciated even then is shown by the fact that provision is made for one matron to every 100 sick and to one nurse for every fifteen sick, the nurses to be under the direction of the matron.

A MORATORIUM FOR SOLDIERS AND SAILORS.

Senate Bill No. 2859, providing a moratorium for soldiers and sailors for the duration of the war has been passed unanimously by both the House of Representatives and the Senate of the United States. Dr. R. R. Denny, chairman of the Physicians' Lease Committee of the Chicago Rotary Club, who has been active in pushing this measure, advises us that the bill will be of very great value to physicians, who have joined the service, in the settlement of their leases. We urge our readers to procure copies of this measure and study its bearing upon the status of physicians' leases, as it will be found that the bill gives much needed relief to physicians joining the army. The committee and its chairman are to be congratulated on the success of their efforts in obtaining the passage of this bill.

News Items.

Surgeon Wanted for Service in Serbia.—The Franco-Serbian Field Hospital Service of America wishes to obtain the services of an experienced surgeon for active work near the front in Serbia in a hospital of 200 beds. Application should be made to the office at 25 West Thirtieth Street, New York.

Herman Knapp Memorial Eye Hospital Appointments.—The following appointments have recently been made on the visiting staff of the hospital: Dr. Mark J. Schoenberg, attending surgeon; Dr. C. F. Bracken, assistant surgeon; Dr. William F. C. Steinbugler, assistant surgeon.

Tuberculous Soldiers to Be Sent to Otisville.—American soldiers suffering from pulmonary tuberculosis will be cared for by the Government at the Otisville Sanatorium of the Department of Health of the City of New York. A new building, with 800 beds, is to be erected there on land placed at the disposal of the army authorities. The new hospital will be ready for patients in about four months.

Personal.—Lieutenant Colonels James W. Van Dusen and Reuben B. Miller, Medical Corps, have been made colonels, and Major Burt W. Colwell, Medical Reserve Corps, has been made a lieutenant colonel in the National Army.

Dr. R. M. Hargrove, professor of anatomy at the University of Oklahoma, has been given a commission in the Medical Reserve Corps of the Army. It is expected that he will be detailed to take charge of the school of orthopedic surgery which is being held in the medical department of the university.

Changes in Staff of Sea View Hospital.—Dr. G. Kremer, formerly physician in charge of the Tuberculosis Admission Bureau, New York, has been appointed superintendent of Sea View Hospital and Sanatorium at West New Brighton, New York. Dr. J. Dworetzky, formerly a member of the resident staff of the New York Municipal Sanatorium, Otisville, N. Y., has been appointed resident physician and designated acting deputy medical superintendent of the institution. Dr. M. G. Milan, formerly of the resident staff of the Otisville Sanatorium, has been appointed resident physician, to succeed Dr. Stanley L. Wang who resigned recently.

Antipneumococcic and Antimeningococcic Serums Tested at the Hygienic Laboratory.—In order that those who use antipneumococcic and antimeningococcic serums should be assured that such of these serums as are sold in interstate traffic are suitable for therapeutic purposes, each lot of these products made by the various manufacturers is tested at the Hygienic Laboratory of the United States Public Health Service prior to being placed on the market. The quality of antipneumococcic serum is judged by its protective value against Type I pneumococci, using mice for test purposes. Antimeningococcic serum is judged by agglutination and complement fixation tests, such as prove satisfactory by either test being passed.

Prevention of Mental Disease.—With the State hospitals for the insane crowded twenty per cent, beyond their rated capacity and with the insanity rate apparently mounting upward, the State Hospital Commission in its annual report recommends vigorous State wide efforts to prevent mental diseases. Expressing the belief that nearly one half of all the cases of insanity are preventable, the commission recommends five definite steps to prevent mental disease. They are: Checking the excessive use of alcoholic liquors; checking the ravages of syphilis; informing the public more fully about mental diseases, and teaching mental hygiene; steps to eliminate extreme poverty; extension of the out patient departments of the State hospitals, with more free clinics for these disorders and field agents to look after incipient and convalescent cases.

Child Welfare.—The United States Children's Bureau has sent out a call to health officers. State councils of defense, State committees of women, and other organizations interested in safeguarding the health of children, asking them to make a special effort during 1918 to promote child welfare. So far as New York City is concerned, the work now being carried on by the health department commences with the care of the expectant mother, deals with the infant through the baby health stations, with the older children through the system of school medical inspection, and when the child goes to work, physical and mental fitness are determined by examination for employment certificates. Closely related to this work is the protection and improvement of the city's milk supply, the control of contagious diseases, the supervision of midwives and of foundlings, and innumerable other activities carried on by other city departments and various philanthropic organizations. The success of the work is shown by the fact that the infant death rate in 1917 was 83.8 per 1,000 births, as compared with a rate of 125.6 during 1916; among children under five years of age the death rate was 30.2 in 1917 and 47.7 in 1916; among children under fifteen years the rate was 19.7 in 1917 and 12.7 in 1916.

Meetings of Medical Societies to Be Held in Philadelphia during the Coming Week.—Monday, February 25th, North Branch of the County Medical Society, Gynotourinary Society; Tuesday, February 26th, Academy of Stomatology, Jewish Hospital Clinical Society, West Philadelphia Medical Association; Wednesday, February 27th, County Medical Society, Neurological Society; Thursday, February 28th, Pathological Society, Biological Club of Philadelphia; Friday, March 1st, Kensington Branch of the County Medical Society, Physicians' Motor Club (directors).

Germans Attempt to Bomb an American Field Hospital.—According to press dispatches, an American field hospital within the lines of the American armies in France was the target for a German airplane which flew over it on Friday night, February 15th, dropping several heavy bombs. The hospital, in which were a number of sick and wounded officers and men, was the building nearest the places where the German airmen dropped two different sets of bombs. Fortunately none of the missiles reached its mark, although the hospital patients and the residents of the town were severely shaken by the explosions. The hospital probably will be moved to a less dangerous spot.

Mount Sinai Hospital Staff in the Army.—Up to January 10th, seventy-five physicians connected with the Mount Sinai Hospital had been commissioned in the Medical Reserve Corps; these included the following groups: Attending staff, medical and surgical, seventeen; out-patient staff, twenty-two; attending specialists, eight; interns, twenty-eight. In addition, more than forty members of the Mount Sinai Alumni Association have been commissioned and have been assigned to active duty. Of the board of trustees of the hospital, one has been commissioned as a major in the Quartermaster's Department, and one a major in the Engineers' Corps; in addition, two members of the board of trustees are giving full time service to the American Red Cross. Sixty-five Mount Sinai nurses, including the associate superintendent and the night superintendent of the training school, comprise the nursing staff of Base Hospital Unit No. 3 (the Mount Sinai Hospital Unit), which is now on foreign service.

Prevention of Disease in War Industries.—At a meeting of the New York Academy of Medicine, to be held Thursday evening, March 7th, under the auspices of the Public Health Council, the evening will be devoted to a discussion of The Prevention of Diseases in War Industries. The topics to be presented are: Extent and Importance of the Problem, by Dr. David Linn Edsall, professor of clinical medicine, Harvard University; New Poisons in War Industries (illustrated by lantern slides), by Dr. W. Gilman Thompson, emeritus professor of medicine, Cornell University Medical College; Methods of Prevention and Control, by Dr. Joseph W. Schereschewsky, director, U. S. Public Health Laboratory, Pittsburgh; Aid from the Medical Profession, by Dr. Alfred Stengel, professor of medicine, University of Pennsylvania.

The United States Public Health Service has begun the collection and dissemination of information aimed to protect the lives of workers engaged in war industries.

Meetings of Medical Societies to Be Held in New York during the Coming Week.—Monday, February 25th, Medical Society of the County of New York; Tuesday, February 26th, New York Academy of Medicine (Section in Obstetrics and Gynecology), New York Psychoanalytic Society, New York Dermatological Society, Metropolitan Medical Society of New York City, New York Medical Union (annual), New York City Riverside Practitioners' Society, Valentine Mott Medical Society, Washington Heights Medical Society, Woman's Hospital Society, Therapeutic Club; Wednesday, February 27th, New York Academy of Medicine (Section in Laryngology and Rhinology), New York Surgical Society, New York Society of Internal Medicine; Thursday, February 28th, Ex-Interno Society of Seney Hospital, Hospital Graduates' Club (New York) New York Physicians' Association; Friday, March 1st, New York Academy of Medicine (Section in Surgery), New Utrecht Medical Society, New York Microscopical Society, Brooklyn Gynecological Society, Practitioners' Society of New York, Society for Serology and Hematology (annual), Alumni Association of Roosevelt Hospital; Saturday, March 2nd, Benjamin Rush Medical Society.

Modern Treatment and Preventive Medicine

A Compendium of Therapeutics and Prophylaxis, Original and Adapted

TREATMENT OF SLEEPLESSNESS.

By LOUIS T. DE M. SAJOUS, S. B., M. D.,
Philadelphia.

(Continued from page 345.)

In preceding issues evidence was presented tending to show that the causes of sleeplessness can with accuracy be grouped under two main headings, viz., causes producing unusual circulatory conditions in the nervous tissues and causes producing excitation of the nerve centres through the intermediary of nervous pathways. Various general therapeutic measures for relieving the circulatory type of sleeplessness have also been referred to. Before taking up the treatment of the nervous, excitative type of insomnia, it will be advisable to mention certain subsidiary forms in which, in so far as can be judged from data now available, both circulatory and excitative influences may be simultaneously operative. The first of these comprises that group of cases in which the sleeplessness is due to absence, during the normal sleeping period, of the circulatory and nervous fatigue ordinarily predisposing to sleep at the close of the day. Lack of physical or mental activity during the daytime fostered by laziness, opulence, or other causes, seems at times *per se* to be a factor in sleeplessness. Neither nerve cells, heart, nor vasomotor mechanism having become adequately fatigued, the usual demand for nervous rest and repair and the customary relaxation of the circulatory tree which leads to partial subsidence of the blood away from the most elevated portions of the body, including the brain centres, fail to present themselves to the extent natural in subjects more actively occupied, and important factors normally tending toward sleep induction are thus rendered partly inoperative. Especially would sleeplessness be likely thus to arise where a period of physical or mental inertia was being indulged in as an interruption in the subject's ordinary active occupation. The remedy for this form of sleeplessness is simple, resumption of the usual activities sufficing to reestablish the proper physiological preparation for sleep at the close of the day.

Only slightly different from the condition just referred to is that in which insomnia at night arises because of more or less prolonged naps taken in the daytime. Since lack of diurnal activity is apt to lead to drowsiness during this period owing to absence of the usual stimulation resulting from moderate physical or mental activity, especially at the outset of such activity, this second form of sleeplessness often coexists with that previously described, naps indulged in by day acting in conjunction with the general diurnal slothfulness to favor nocturnal sleeplessness. In unoccupied aged persons especially is insomnia complained of, because of frequent dropping off to sleep in the daytime. At times it is difficult for the patient to realize how much sleep is thus taken in the customary waking hours. Rational treatment in such cases consists in urging the patient

to remain awake throughout the day and encouraging moderate physical activity. Where a clamor is made for drug treatment, a placebo will often yield better results than, e. g., morphine, which frequently causes excitation rather than depression in the aged.

Another form of insomnia in which, apparently, both circulatory and excitative factors may assume a rôle is that which is of toxic origin. Relatively little is known of the precise action on the various body tissues of many of the toxic products, exogenous or endogenous, circulating in the system in the presence of metabolic disorders, infections, enterogenous intoxications, etc. Yet in some instances more information is already at hand, and upon examination of the data available a presumptive conception of the effects of a majority of the poisonous substances commonly encountered by the human body can be obtained.

Seemingly important as the type of a number of toxic substances tending to induce sleeplessness is caffeine, which, as is well known, is chemically rather closely related to the purin bodies. The nervous effects of caffeine, characterized, among other features, by an increase of the reflex irritability of the central nervous system, are such as would in themselves lead to sleeplessness. This augmented reflex irritability promotes, in the brain, a continued activity of the psychic areas. The disappearance of drowsiness and nervous fatigue under caffeine are ascribed to a direct stimulating action of the alkaloid on the nervous tissues themselves. A review of certain peculiarities of its circulatory action will tend to show, however, that the distribution of the blood in the system is likewise so modified as to antagonize sleep induction. According to Sollmann, 1917, and his coworkers, the predominant action of therapeutic and moderate physiological doses of caffeine consists in vasodilatation. But this action is combined with sufficient cardiac stimulation to maintain the blood pressure or even to raise it somewhat. Small and moderate doses of caffeine generally induce, in experimental animals, a slight rise of the blood pressure, combined, as a rule, with some increase of the heart rate and a heightened tonicity of the heart. The output of the heart is thus augmented and the flow of the blood in general accentuated. That these changes react on the intracranial circulation is plain in the light of the demonstration by Roy and Sherrington, 1887, that the volume of the cerebrum increases upon administration of caffeine, and the statement of Hirschfelder, 1915, that the vessels of the pia mater are dilated by caffeine during life. While in man the effects of small doses of caffeine on the heart rate and blood pressure are more variable than in the experimental animals, it is a recognized fact that under caffeine the blood flow tends to increase through augmented systolic output of the heart. According to Sollmann, caffeine given hypodermically to resting individuals causes an increase in the total blood flow; this increase does not occur, however, in subjects perform-

ing work at the time. Thus, it would seem that it is especially in subjects already at rest and awaiting the oncoming of sleep that the circulatory action of caffeine opposes itself to sleep induction. Of interest and significance in this connection, likewise, is the observation of Hewlett, 1913, that the volume of the human arm is diminished under the influence of caffeine. Recalling Mosso's plethysmographic studies illustrating the physiological dilatation of the vessels of the upper extremity during sleep, one may assume a tendency on the part of caffeine directly to impede the change of blood distribution, viz., the derivation of blood from the brain to the skin and other peripheral structures, which is deemed by Howell a major factor in sleep induction. Again the increase in the volume of the cerebrum under caffeine noted by Roy and Sherrington has been found in animals more marked and persistent than the rise in blood pressure caused by the alkaloid. According to this, the vasodilatation produced by caffeine in the brain may be expected to persist even after the blood pressure, kept from diminishing by the caffeine in spite of the subject's being at rest, has begun to descend through exhaustion of the action of the drug on the heart.

On the whole, the circulatory actions of caffeine seem to cooperate in almost every conceivable fashion to prevent sleep. Hence the importance of excluding coffee or tea in the later hours of the day in the various forms of habitual insomnia. The brain tending, under caffeine, to remain hyperemic even after the effect of the drug on the blood pressure has subsided, postural measures calculated to permit descent of the excess of blood into the more dependent structures would seem particularly appropriate at this time.

(To be continued.)

Tuberculous Disease of the Larger Joints and of the Spine.—Herbert F. Waterhouse (*Practitioner*, January, 1918) has a profound faith in tuberculin as a remedy for surgical tuberculosis. In his experience almost all patients benefit from the administration of the drug, provided it is given intelligently, but he has found it impossible to predict, in any individual patient, the amount of the drug which will prove of the greatest service. The vital question is the dose, regarding which he can give no definite rules, but gives the following schedule of the usual way he employs new tuberculin, T. R. The doses are a week apart. First, 1/20,000 mgm.; second, 1/15,000 mgm.; third, 1/12,000 mgm.; fourth, 1/8,000 mgm.; fifth, 1/6,000 mgm.; sixth, 1/4,000 mgm.; seventh, 1/3,200; eighth, 1/2,400 mgm.; ninth, 1/1,800 mgm.; tenth, 1/1,500 mgm.; eleventh, 1/1,200 mgm.; twelfth, 1/1,000 mgm.

When the drug is well borne, and it seems to be further indicated, he gives eight more injections, 1/900, 1/800, 1/700, 1/600, 1/500, 1/400, 1/300, and 1/250 mgm. Beyond this he has never ventured. If a decided reaction should occur after any dose, the same dose is repeated and not increased next time; in ninety-eight cases out of a hundred there will be no reaction. In addition to the use of tuberculin general antituberculous treat-

ment must be employed, as well as special treatment, when dealing with tuberculosis of the joints and spine. Bier's hyperemic treatment is a valuable adjunct in all cases of tuberculosis of the joints that lend themselves to treatment by an elastic bandage gently constricting the lower part of the thick or upper arm; this excludes the shoulder and the hip. The bandage must be applied neither too tightly nor too loosely. The value of a ten per cent. emulsion of iodoform in glycerin is particularly great in the treatment of tuberculous abscesses, especially when connected with disease of the spine. Not over five drams of the emulsion should be used, usually less than half that amount. The abscess should be incised, washed out with sterilized saline, the emulsion introduced and the wound closed. Never, under any circumstances, insert a drainage tube into a tuberculous abscess.

Absolute immobilization of the diseased part until pain, tenderness, and muscular rigidity have vanished, is of prime importance. Operative treatment is called for more often in adults than in children. Tuberculosis of the hip joint is essentially a disease of childhood; the first indication is absolute rest of the joint and separation of the softened bony ends, by putting the patient to bed and applying weight extension. After this has done its work a splint must be applied to enable the patient to get about on crutches. Tuberculous disease of the knee joint may occur at any age; he has seen it start at six months of age and at eighty years. The treatment differs in children and in adults. In the latter operative treatment is indicated, if the disease is at all advanced, but in children this is seldom the case; the indication then is for rest in bed, weight extension, Bier's hyperemia, and iodoform glycerin injections, and later for the patient to be about on crutches wearing a suitable splint and with a patten attached to the shoe of the sound foot. Tuberculosis of the ankle joint is often met with in adults, the prognosis is relatively good, and the treatment is to fix the foot at a right angle in plaster of Paris, or a suitable splint, to apply Bier's hyperemia, and to use the iodoform glycerin emulsion. Tuberculosis of the shoulder joint is usually met with in adults, and the prognosis seems to be better than that of the disease in any other of the six large joints. Fix the limb in slight abduction with the elbow flexed and the thumb directed upward. It is better to have the humerus somewhat abducted, as there will almost certainly be ankylosis. Use the iodoform emulsion. In tuberculosis of the elbow joint conservative treatment frequently secures recovery with a movable articulation, but as ankylosis may occur the elbow should be fixed so that the forearm makes, with the arm, an angle just less than a right angle, with the hand so that the thumb points upward, so that the limb may be useful. Often it is necessary to give an anesthetic in order to get the limb into the proper position. Tuberculosis of the wrist joint may occur at any age, and the writer's experience with it is a doubtful one. Operative treatment is generally demanded and the final result is apt to be a not very

useful hand. In order to render the hand at all useful it must be dorsiflexed, with the forearm, wrist, and hand fixed in immobile apparatus. The first desideratum in tuberculous disease of the spine is perfect rest in the recumbent position in bed, without a pillow, maintained for months, until all pain, tenderness, and muscular rigidity have disappeared. Extension and counterirritation should be applied in acute cases. When the disease appears to be quiescent a proper splint can be applied and the patient taken out into the fresh air. Extension and absolute rest form the basis of the treatment. It is better to persist with rest and immobility three months too long, than to permit movement one week too soon, for a recrudescence of the disease is far more difficult to treat successfully than the original lesion.

Erythrocytic Resistance in Malaria.—L. Netter (*Presse médicale*, December 3, 1917) found in Morocco that in the initial attack of malarial fever as well as in subsequent benign paroxysms the resistance of the red blood cells to hypotonic saline solution is distinctly increased. In normal subjects of European stock initial hemolysis takes place with a 0.45 per cent. solution and complete hemolysis with a 0.3 per cent. solution. In healthy Senegalese and Soudanese subjects initial hemolysis occurred only at 0.375 per cent., and the strong resisting power thus exhibited is held a possible cause of the immunity of the African troops to Moroccan malaria. In relation to malarial paroxysms an increase of cell resistance was regularly noted in thirty-seven instances. In one case complete hemolysis occurred only at 0.225 per cent., though as a rule it took place near the normal 0.3 per cent. The increased resistance was particularly manifest in the initial hemolysis, which occurred at from 0.35 to 0.425, as compared to the normal 0.45. The increased resistance began only a short time before the paroxysm, and at times the resistance dropped back to normal the next day, though occasionally the resistance remained somewhat high for a few days. The resistance increases according to the number of malarial parasites in the blood and also varies according to the form of malaria present, tropical malaria cases showing a higher resistance than the benign tertian cases. The presence of gametes in the peripheral blood nearly always kept the red cell resistance appreciably above normal. The antihemolysins contained in the blood plasma and in the hematopoietic organs are believed by the author to take part in increasing the resistance. In doubtful cases, with negative blood examination for plasmodia, he recommends estimation of the cell resistance as a diagnostic measure; where initial hemolysis occurs only at 0.4 or 0.375 per cent., malaria probably exists and prompt quinine therapy is indicated. Intramuscular injections of basic quinine hydrochloride administered at the time of the paroxysms and on subsequent days were found distinctly to reinforce the red cell resistance, especially with doses exceeding 1.2 grams. Daily injections of three grams of the quinine salt in a single dose markedly increased the resistance in six hours, initial hemolysis, for example, being

lowered from 0.425 to 0.375 per cent. Less intense effects were noted where quinine was given by mouth in a daily dose exceeding 1.5 grams, and slight effects from a dose of one gram. As time elapsed since the last paroxysm, however, and especially when the parasites disappeared from the peripheral circulation, quinine failed to maintain the resistance above normal. The action of quinine on cell resistance must therefore be indirect, and related to the presence in the blood of immunizing, antihemolytic substances, of which quinine reinforces the formation and activity, doubtless by causing massive destruction of the parasite.

Peptic Ulcer.—Ludwig Kast (*New York State Journal of Medicine*, December, 1917) points out that there is no specific treatment for peptic ulcer and that nonsurgical measures can only stimulate the natural tendency to heal and eliminate the factors which interfere with it. The secret of success in nonsurgical treatment lies in the rational application of tested principles rather than the adoption of any one specific plan. Causative factors such as focal infections and vagotonia should be eliminated as far as possible. The general principles may be grouped under several headings. For mechanical protection of the ulcerated surface doses of four to twelve grams of bismuth should be given before the main feeding and the first thing in the morning. Nitrate of silver in doses of fifteen mils of a 1:500 solution, taken half an hour before meals, increases the secretion of mucus and protects the ulcer surface. The action of the hydrochloric acid can be reduced by the use of acid binding foods, such as white of egg, milk, and readily digestible meats, and by the use of such alkalis as sodium bicarbonate, magnesia, calcium salts, either alone or combined. The doses of these alkalis must be large and frequently repeated and should be given specially before gastric distress appears. A large dose should also be given at night. Gastric secretion should be checked by avoiding stimulating foods like the meat extractives, condiments, and alcohol; by avoiding fancy dishes and fancy serving; by dulling the appetite through frequent small feedings; by avoiding foods which stay long in the stomach, as ham, hash, pork, and other fat meats; and, finally, by the use of atropine in increasing doses up to one milligram of the sulphate twice or three times daily, or ten mgm. of the extract of belladonna. The diet should be arranged carefully to meet the patient's needs and capacities and should usually begin with milk, albumen water, and thin gruels in small amounts every hour or two. The diet should be increased very gradually by the addition of one article at a time and the intervals between feedings should be slowly lengthened. Suitable foods comprise: Milk toast, cream, rice, cooked cereals, eggs, cream soups, potato, custard, ice cream, puddings, minced white meat, and minced vegetables. Acute hemorrhage demands rest in bed; interdiction of everything by mouth; rectal feeding and fluids; morphine; ice bag to epigastrium; gelatin enemas, and ice water lavage. The stomach should be washed out at night if there is retention of food and constipation must be controlled by enemas or mineral or olive oil by mouth.

Disinfection of Pneumococcus Carriers.—John A. Kolmer and Edward Steinfield (*Journal A. M. A.*, January 5, 1918) recall the fact that the investigations of others have proved the existence of carriers among the contacts of pneumonia cases and point out the desirability of having some method of disinfecting the nasopharyngeal passages of these carriers and also of the patients themselves. Ethyl hydrocuprein and such other cinchonic as quinine and urea hydrochloride or quinine bisulphate have been shown to have marked pneumococidal activity. Accordingly experiments were undertaken to elaborate a suitable mouth wash and gargle containing one or the other of these. The experiments showed that a solution called "liquor thymolis" made a very acceptable vehicle for the cinchonic when diluted ten times. This liquor thymolis had the following formula:

Benzoic acid,	4.0
Boric acid	8.0
Thymol,	1.0
Menthol, }	1.0
Oil of eucalyptus,	
Oil of wintergreen, {	0.25
Oil of Monarda, }	
Alcohol,	125.00
Glycerin, }	
Water,	to make 500.00

This alone exerted slight pneumococidal activity and served to disguise the bitter taste of the cinchonic added. It was found that the addition of either of the two quinine compounds mentioned, or of ethyl hydrocuprein in the proportion of 1:10,000 yielded a preparation which was not disagreeable to use, was safe for repeated use, and was effective in destroying all forms of pneumococci.

Alimentary Glycosuria.—Allan Eustis (*New Orleans Medical and Surgical Journal*, January, 1918) asserts that there are certain cases of alimentary glycosuria due to faulty liver function and intestinal toxemia, which may be relieved by treating the latter condition and in which the carbohydrate metabolism is a relatively unimportant factor. A patient with glycosuria should not be placed upon the starvation treatment until it has been ascertained positively that diabetes exists. When a poorly functioning liver has been found to be present and there is evidence of intestinal toxemia, he considers it justifiable to give an initial purgative, prohibit all animal protein, including milk, and allow an abundance of cereals, fruits, and vegetables. In such cases as he describes the sugar should disappear from the urine in from twenty-four to forty-eight hours, but treatment should be continued for at least two months with a view to overcome any tendency to intestinal toxemia. He has obtained good results from administering a capsule three times daily containing two grains of acid sodium oleate, one grain of phenolphthalein, and two grains of sodium salicylate. An active culture of the *Bacillus bulgaricus* is of benefit when properly administered, and should be given one hour before meals when there is the least acid in the stomach; two good tablets may be crushed in a quarter of a glass of water with a teaspoonful of lactose added. The choice of laxative will vary with the individual, but his favorite is a confection of raisins, dried figs, and senna leaves,

with mineral oil next in favor. Enteroptosis should be corrected with a suitable abdominal supporter, and cecal stasis due to a chronic inflammation of the appendix should be relieved by surgical measures. Exercise should be insisted upon in all cases unless contraindicated by a weakened heart muscle. This treatment in no way takes the place of the starvation treatment of diabetes, but helps to exclude the nondiabetic cases of glycosuria in which starvation is not indicated.

Newer Methods of Treating Wounds.—Fitch C. E. Mattison (*Medical Record*, December 1, 1917), in reviewing the literature, finds that there are two schools or factions. One may be called the antiseptic school from its adherence to antiseptics. The other, led by Sir Almroth Wright, depends on the use of concentrated saline solutions to favor the rapid removal of all discharge from the wound. Both schools agree that all infected material must be removed from the wound, that drainage must be thorough and include all parts of the wound, and that such drains must drain and not leave any pockets; further that drains—either tubes or gauze wicks—must be placed so that no obstruction is made to the free exit of secretions. The antiseptics used must not be so strong that coagulation of the discharge takes place or irritation is caused, but, where possible, wounds should be left open and not covered with thick heavy dressings which may become saturated with discharge and act as a pus poultice, clogging up lymph spaces and favoring absorption rather than elimination.

Influence of Inoculation on the Complications of Typhoid and the Paratyphoid Fevers.—A. E. Webb-Johnson (*Lancet*, December 1, 1917) in the course of a paper on the surgical complications of these diseases brings out some valuable information on the influence of prophylactic inoculation on the frequency of the complications as well as on the general severity of the diseases themselves. Some of the figures are presented in the subjoined table, abbreviated from the author's more detailed tabulation.

	Deaths, per cent.	Complications, per cent.
Typhoid inoculated	3.28	7.55
Typhoid noninoculated	19.19	35.60
Paratyphoid inoculated, A.	0	0.81
Paratyphoid noninoculated ...	0.45	10.85
Paratyphoid inoculated, B.	0.41	5.85
Paratyphoid noninoculated ...	2.12	15.30

The complications included number twenty-eight, all of which are surgical. Among the more serious complications inoculation reduced the incidence of hemorrhage in typhoid from 13.46 per cent. to 1.21 per cent.; in paratyphoid B from 1.87 to 0.41 per cent.; perforation was similarly reduced in typhoid from 2.02 to 0.36 per cent.; in paratyphoid A and B, respectively from 0.9 and 0.37 per cent. to nil; and venous thrombosis fell from 3.36 to 0.85 per cent. in typhoid as the result of inoculation, from 0.9 per cent. to nil in paratyphoid A, and from 2.5 to 1.25 per cent. in paratyphoid B. The fact that the specific organisms are not found in the blood, urine, or feces of the inoculated in anything like the frequency that obtains in the noninoculated probably accounts for the relative freedom from complications and sequelae among the former.

Treatment of Celoids by Radium.—Frederick C. Harrison (*Urologic and Cutaneous Review*, January, 1918) reports several cases and points out that the treatment of these conditions by excision, injections of thiosiamin and electrolysis has been very unsatisfactory. The technic of radium treatment in these cases is very simple. Definite rules as to length of exposure can be formulated and definite applicators should be used so that the proper amount of screening and the length of exposure necessary may be determined. All the cases reported on show disappearance or marked improvement.

Radium Therapy for Senile Epithelioma.—Malford W. Thewlis (*Urologic and Cutaneous Review*, January, 1918) reaches the following conclusions: 1. The older the patient the better the results from radium therapy in basal celled carcinoma. 2. Cautious treatment is advised because severe burns may result, especially of the ear. 3. Radium is sometimes the only remedy that will relieve the pain of epithelioma. 4. Many cases remain healed for several years. 5. If it remains healed for five years a cure may be pronounced.

Radium Treatment of Malignant Diseases of the Lips, Buccal Cavity, Tongue, Palate, Posterior Nares, and Tonsils.—John M. Lee (*Urologic and Cutaneous Review*, January, 1918) uses radium enclosed in rubber tubes which are fastened to the lips by means of wire for the treatment in this location. Similar tubes are used in treating the tongue or buccal cavity. At times, these tubes may have to be fastened to the tongue by means of a silk suture. For treating the posterior nares an arrangement somewhat similar to the posterior nasal plug for controlling hemorrhage is used.

Radium in Tuberculosis of the Skin.—W. H. B. Aikins (*Urologic and Cutaneous Review*, January, 1918) treats with radium the various forms of tuberculosis of the skin, the most common of which is lupus vulgaris. The other eruptions are known as tuberculides and exhibit the following characteristics: 1, they appear in a tuberculous subject who reacts to tuberculin; 2, the eruption is usually bilaterally symmetrical; 3, the histology suggests tuberculosis; 4, most of the cases tend to spontaneous recovery; 5, Koch's bacillus is generally absent; 6, inoculation of guineapigs is seldom successful. The results of treatment have been very satisfactory.

Hodgkin's Disease.—Channing C. Simmons and George Benet (*Boston Medical and Surgical Journal*, December 13, 1917) find that treatment by radium and the x ray is followed by a marked temporary amelioration of the symptoms, a diminution in the size of the glands, and an improvement in the general condition, but admit that in the majority of cases it did not prevent the progress of the disease to a fatal termination. Radium seems to be of more value than the x ray. The improvement is such that the patients are comfortable and able to attend to their duties until nearly the end of the disease. The treatment should not be limited to the palpable glands, but should be directed against the lymphatic areas of the body, the mediastinum, abdomen, etc., from the first.

Simple Appliance for Training Infants to Stool.—Cary Luggeston (*Journal A. M. A.*, January 19, 1918) describes a simple appliance which has given good results in his hands. It consists of a glass rod ten centimetres long and five millimetres in diameter, well rounded in the flame and bent to an obtuse angle of about 150° at a point three centimetres from one end. The short arm is lubricated with petrolatum and inserted into the infant's anus to near the bend. The instrument has the advantages of safety, convenience, and cheapness as compared with the commonly employed clinical thermometer or suppositories of glycerin or soap.

Applying Carrel-Dakin Methods to Wounds in Private Practice.—Philip J. Reel (*Ohio State Medical Journal*, January, 1918) in outlining the method points out that the solution should be non-irritating. If the patient complains of continuous burning in or about the wound the solution has usually become alkaline. If so, it should be neutralized with a solution of boric acid. As it breaks down readily it should be kept in well corked dark bottles. A preparation more than a week old should be discarded. The bacteriological status of the wound should be determined every few days. The best results are obtained with Carrel-Dakin outfits manufactured by several of the commercial houses. Gauze should not be employed. The tubes should not be allowed to remain in any one position more than twenty-four hours. The irrigations should be made at two-hour intervals and a sufficient amount used to bathe the parts thoroughly. The dressing should not become dry between treatments nor should the wounded part be allowed to lie in a wet bed. Sterile petrolatum may be used on the surrounding skin to prevent ulceration.

Hot, Gutta Percha Covered Dressings in Gynecological and Other Affections.—Bonet-Henry (*Bulletin de l'Académie de médecine*, November 27, 1917) notes that while metritis, menorrhagia, and cervical ulcerations improve under local irrigations at temperatures not exceeding 45° or 45° C., fatty materials such as liquid petrolatum and paraffin are advantageous in that they can be applied for a longer time. By further use of some poorly conducting material, temperatures can be employed without danger of a burn such as could not otherwise be tolerated and the dressing can be made to lose heat so slowly as to register 39° or 40° C. even on the following day. The nonconductor material recommended by the author is gutta percha. This causes melted paraffin mixed with it to cool ten times more slowly than water, permits of its application at temperatures of 60 to 90° C., and supplies a painless, supple, and elastically supportive dressing. The mixture recommended consists of fifty parts of gutta percha to 1,000 parts of a paraffin fusing between 42 and 45° C. The high temperatures to which paraffin can be subjected permits of perfect sterilization. Its analgesic action is undoubted, and the active congestive it induces in the tissues causes an influx of phagocytes which yields favorable results in infected wounds. The mixture referred to has also been employed with satisfaction in gynecological affections, varicose ulcers, and burns.

Miscellany from Home and Foreign Journals

The Venereal Situation Among the Forces at War.—John C. Spencer (*California State Journal of Medicine*, January, 1918) after a review of the situation comes to the following conclusions: The military authorities of the world are agreed on the devastating effects of venereal disease upon the enlisted men of the army and navy. Likewise they are agreed that fighting efficiency is the one requisite demanded of the troops. The overwhelming majority is agreed that prompt diagnosis and early and persistent treatment are the most vitally essential factors in reducing the amount of venereal disease and in keeping the greatest number of men efficient for fighting. All authorities are agreed on the fallaciousness of any system of segregation, regulation, and inspection of prostitutes under existing conditions. Unless these obsolete and inefficient methods are capable of being carried out under a strict lock and key quarantine, their futility is absolute. Even under a fairly frequent system of inspection there can be no escape from the great probability of an infection between inspections. The most fallible part of this archaic system is that of confining the inspection to one sex. The opinion is also practically unanimous that until the whole civilized world is united on some method of prophylaxis more effective than the present moral and educational methods, in view of the proneness of the men in service, unless rigidly controlled by the military authorities, to indulge in impure sexual relations, some form of individual prophylaxis must be provided for them. Its use must be made compulsory, and the failure to use it be penalized. The inspection and prophylaxis introduced into our army in 1912 have greatly reduced the amount of venereal disease. Lyster regards the education of the new medical officers as the first condition to success, the education of the line officers as the second, and that of the men themselves as the third.

Rare Type of Bladder Ulcer.—Guy L. Hunner (*Journal A. M. A.*, January 26, 1918) first described this uncommon type of bladder lesion in 1914, but hopes that a redescription of the condition with the report of eighteen cases may serve to stimulate interest in the matter and bring forth other observations upon its causation and symptomatology. The lesion is a chronic inflammation of all of the coats of the bladder, and when first seen is usually widespread. The chief symptom of the lesion is pain, although the usual symptoms of cystitis are also commonly present in variable degrees. The pain is often most extreme and is cutting or stabbing. It is frequently referred to some other part of the pelvis, specially to the rectum. It is increased after eating, by gas in the bowels, by defecation, by constipation, and sometimes even by slight jarring. Turning in bed may provoke a severe attack. The urine is clear, except for a cloud of mucin, and is negative except for a few leucocytes and occasional red blood cells. The condition is usually one of long standing when the patient first comes for treatment, often having been

complained of on and off for years. Cystoscopic examination, if not very careful, may miss the lesion entirely, but careful cystoscopy, especially with the patient in the knee chest position, will show a small abrasion on the mucous surface, most commonly in the vertex of the bladder. The lesion bleeds very readily, is small, being from two to five millimetres in diameter, seems very superficial, is exceedingly sensitive to the lightest touch, and may be either single or multiple. Other cases show a dead white area of glazed mucosa with choppy, broken vessels, and a small, white scar in a zone of slight congestion. At times there may appear a small area of edema which develops during the examination. Pathologically the local small lesion is an ulcer, but beneath it and involving the entire thickness of the bladder for a variable extent there is chronic, edematous inflammation of the bladder. This may involve the major part of the organ. The etiology of this lesion is unknown, but there seems to be some evidence for believing that the condition is secondary to a focus of infection in some other part of the body, such as the tonsils, sinuses, or teeth. The only form of treatment which can be regarded as more than palliative is surgical excision of the entire affected area of the bladder. Even the most drastic palliative measures give only moderate temporary relief.

Results of Immediate Operation in Wounds of the Heart.—Costantini and Vigot (*Presse médicale*, November 29, 1917) report two cases of shell wound of the heart with almost immediate operation and recovery in both. The first was a case of deep but nonperforating injury of the left ventricle. The missile was removed from the pericardial sac, the wound sutured, and the patient discharged on the fifteenth day. In the second case, an opening sufficiently large to admit a lead pencil had been produced in the left auricle. Suture was successfully effected, but the subsequent course of the case was complicated by a left sided infected hemothorax. Sterilization of the pleural cavity was accomplished with Dakin's fluid and the patient discharged after seven weeks, the x rays showing the shell fragment still embedded in the left lung. Absolute immobility of the cardiopericardial shadow during radioscopy, due to the hemopericardium, is emphasized by the authors as a positive diagnostic sign of wound of the heart. Regarding the operative technic, they lay stress on such exposure of the organ as will permit of seeing and carefully examining it. To secure sufficient exposure, section of the sternum seems indispensable, and they recommend regular use of this procedure. One method consists in forming a flap with its base situated externally and including the cartilages of the third, fourth, and fifth ribs, to be followed by transverse section of the sternum and permanent removal of part of its left border. This method was practically that employed in the first patient. A second procedure consists in making a chondrosternal flap including the entire corresponding segment of the sternum. Such a flap in the second case afforded satisfactory exposure.

Incidence of Scabies in War Time.—G. Thibierge (*Bulletin de l'Académie de médecine*, November 20, 1917) presents statistics from the Paris hospitals showing that since the beginning of the war the incidence of scabies has been constantly increasing. The incidence among females is especially significant, since the number of females admitted is not liable to variation from such factors as mobilization, the recall of workmen, and the calling out of new military classes. The incidence among women showed in the last quarter of 1917 an increase of 350 per cent. as compared to the corresponding quarter of 1914. All classes of the Parisian population are participating in this increase, the author now receiving ten to twelve scabies cases among every 100 patients, whereas before the war the ratio of scabies was hardly one per cent. Transmission occurs generally at night, and especially in sexual intercourse. A single woman with scabies in a cantonment results in transmission to numerous men. Transmission also occurs through bedclothing, and therefore increases with any difficulty experienced in securing proper laundering and disinfection of blankets or sleeping bags. In the civil population the increase in scabies results chiefly from the return of the men on furlough. The scabies curve shows a marked rise in the last quarter of 1915, and it was in July of that year that the first furloughs were granted. Propagation is likewise favored by frequent failures to recognize the disease, the author daily meeting with scabies cases treated for months for eczema, urticaria, prurigo of digestive origin, etc. Concluding, the author urges attention to the extreme frequency of the disease, careful examination for its signs in all cases of itching, and the institution of proper hygienic and prophylactic measures by the authorities.

Effect of Injections of Hemolytic Streptococci in Susceptible and Insusceptible Animals.—J. Gardner Hopkins and Julia T. Parker (*Journal of Experimental Medicine*, January, 1918) found that hemolytic streptococci of rather low virulence for rabbits, given in sublethal dose, may completely disappear from the blood stream within a few hours. If a lethal injection is used, over ninety per cent. of the cocci are removed from the circulation within the first few minutes and subsequent blood cultures are the lowest in two to three hours, but after four to six hours, the number of organisms again begins to increase. Even with lethal doses, cultures of one c. c. of blood may show no colonies after two or three hours, but usually streptococci do not completely disappear after such an injection. Hemolytic streptococci injected into the circulation of cats are quickly withdrawn and appear in the lung in the largest numbers, and in decreasing numbers in the liver, spleen, bone marrow, lymph nodes, muscle, and kidney. The lung rids itself soonest of the streptococci, although a film of ground lung tissue may show them for several days. In the liver they are killed less rapidly, and the spleen may show viable organisms for some time. The authors believe the bactericidal power depends on the living condition of the cells, and it may be shown in a piece of excised lung, but not in lung extract. In experiments with rabbits, which

are susceptible animals, about equal numbers are absorbed by the lung, liver, and spleen, and the muscles take up a considerable number. As in the cat, the streptococci taken up by the lung and liver are quickly killed, but they lodge in the muscles and multiply there, so that four to eight hours after injection, the number in the blood stream begins to increase. The resulting septicemia is probably due to the washing out of organisms from the infected tissues. The authors were unable to immunize rabbits successfully, but in some of the treated animals the distribution of the organisms among various organs resembled that found in insusceptible animals.

Early Diagnosis of Tuberculosis by the Use of the X Rayed Guinea-pig.—W. H. Eckford (*Journal of Laboratory and Clinical Medicine*, December, 1917) describes the following method as a routine for using x rayed guinea-pigs in the early diagnosis of tuberculosis: The material is prepared according to its nature, by digestion with four per cent. potassium hydroxide and centrifugalization and washing before injection, by digestion with fifteen per cent. antiformin, or by simple centrifugalization. From 0.5 to one c. c. of the prepared material is injected into the groin and the abdomen of the animal, which is then exposed every second day to a five minute dose of the x rays for at least three exposures. If a nodule develops which persists after two weeks, it is removed under a local anesthetic for diagnosis. If positive, it can be reported at once. If negative, the animal should be kept at least six weeks to await developments, but at the end of that time, if the pig has been thoroughly x rayed, the test may safely be called negative. Eckford recommends frequently repeated doses of x ray as having a more certain effect in increasing the susceptibility of the guinea-pigs than single doses. He states that the destruction of lymphoid cells in itself is insufficient to explain the decreased resistance.

Intraspinal Injections of Epinephrine.—John Auer and S. J. Meltzer (*Journal A. M. A.*, January 12, 1918) call attention to the occurrence of very low blood pressures in connection with the dangerous stages of a variety of diseases and in states of shock, and point out that any means of raising the general blood pressure increases the chances of recovery. Epinephrine has been employed for this purpose by various channels of administration, but its action is fleeting when given intravenously and is followed by a marked fall of pressure. Intramuscular injection as well as subcutaneous, gives a more lasting rise of blood pressure, but a relatively small one. On the other hand, experiments on monkeys have shown that the intraspinal injection of the drug is safe and leads to a pronounced and fairly prolonged elevation of the blood pressure. Its similar use in human beings would seem to offer a satisfactory method of raising blood pressure, for not less than an hour following the injection, after which the subcutaneous injection of the drug might be used to maintain the effects. The initial dose intraspinally should not be less than three mils of the 1:1,000 solution.

Solvent Action of Antiseptics on Necrotic Tissue.—Herbert D. Taylor and J. Harold Austin (*Journal of Experimental Medicine*, January, 1918) conducted experiments to determine the importance in the solvent action of antiseptics of three factors: the alkalinity, the nature of the chlorinated antiseptic employed, and the chlorine concentration of the latter. The antiseptics used were chloramine-T solutions, hypochlorite solutions, chlorinated oils, and dichloramine-T. They found that Dakin's hypochlorite solution is capable of dissolving necrotic tissue, pus, and plasma clot in the concentration and reaction used clinically, but that chloramine-T and dichloramine-T do not possess that power. The authors disagree with Fliessinger and his coworkers in their view that the solvent action of the hypochlorite solutions is due to their alkalinity, as the experiments reported show that the solvent action of Dakin's hypochlorite solution in the degree of alkalinity used clinically is due primarily to the hypochlorite content, though the slight alkalinity, while in itself without solvent action, increases the effectiveness of the hypochlorite. In the degree of alkalinity used clinically the solvent action of hypochlorite is absent below about 0.2 per cent. sodium hypochlorite concentration. The hypochlorite concentration at which the solvent action ceases is lower the more alkaline the solution, and *vice versa*. None of the antiseptics used showed solvent action on blood clot.

Binocular Vision and the Hole in the Hand Test.—A. Cantonnet (*Presse médicale*, December 3, 1917) describes a simple test which consists in looking through a rolled up sheet of paper or cardboard tube with one eye while the hand is held up in front of and about twenty-five centimetres from the other eye. Under normal conditions the hand seems as though perforated by a hole through which the objects seen through the tube by the other eye are visible. This procedure serves, in the hands of the general practitioner, as a useful test of binocular vision and for the detection of latent strabismus. Where the right eye looks through the tube and the left hand is held up before the left eye, the patient may, 1, see the image through the tube and also the left hand, in which case binocular vision is present; 2, he may see the image through the tube and not the hand, in which case the left eye is blind or in abeyance; or, 3, he may see the hand but not the image through the tube, in which case the right eye is blind or in abeyance. Again, where binocular vision does exist, it is perfect only where the hole in the hand, with the latter held in contact with the tube, is seen in the centre of the palm. If the hole is seen in the right side of the hand or beyond it on the right, excessive convergence is demonstrated, its extent varying according to the degree of displacement of the hole from the central position. Correspondingly, if the hole is seen to the left of the centre of the palm there is a tendency to divergence, and if it is seen entirely beyond the hand, an actual divergent strabismus. Where the hole is seen higher or lower than the level of the tube, vertical deviation is demonstrated; such deviations are nearly always associated with a more pronounced convergent or divergent deviation.

Common Colds as a Possible Source of Contagion for Lobar Pneumonia.—Eugenia Valentine (*Journal of Experimental Medicine*, January, 1918) reports two cases of common colds occurring in patients who were not known to have been in contact with pneumonia cases, from which pneumococcus Type 1 was recovered and found to be the predominating organism, constituting at least seventy-five per cent. of the organisms developing from the secretion. This suggests the presumption that it was the etiological agent in these colds, and if this be so, common colds of the type described—marked prostration and a temperature of 102° F.—must be regarded as a possible source of contagion in the development of lobar pneumonia due to the Type 1 pneumococcus.

Spinal Cord Changes in Combined Sclerosis.—Walter F. Schaller (*California State Journal of Medicine*, January, 1917) says that the cord changes in combined sclerosis are pseudosystem degenerations of toxic type. These degenerations in the posterior columns of the cord affect more particularly Goll's column and the adjacent portion of Burdach's column, sparing Lissauer's zone and the root entry zone. The localization explains the early involvement of the deep sensibility and conservation of the superficial sensibility. With characteristic cord symptoms a pronounced anemia may not be present. In the absence of a low red blood count and low hemoglobin, an index above one is suggestive of a beginning pernicious anemia. A focal infection is frequently found either in the buccal cavity or the gastrointestinal tract.

Traumatic Pericarditis Due to a Needle.—Arthur J. Hall and J. B. Ferguson Wilson (*Lancet*, December 8, 1917) report the case of a girl twelve years old who picked up a rusty sewing needle and put it in the front of her dress. Later on the same day she vomited twice, felt sick and had some pain in her chest. The mark of a needle prick was found on her chest and half of the needle was found still in her dress. Five days later she had slight fever, rapid and shallow respiration, but no pain. Examination showed a much enlarged area of cardiac dullness, precordial friction rub, and other signs of pericarditis with effusion. Radiographs showed a portion of a needle projecting through the chest wall immediately over the heart and at the level of the fourth costal cartilage just to the left of the sternum. Operation, without opening into the pericardium, permitted the needle to be removed. There were no signs of pus or other evidences of infection and the pericarditis rapidly subsided after the removal of the needle. The interesting features of this case seemed to be the occurrence of a pure, noninfective, and uncomplicated pericarditis. It would seem from the symptoms present, which were few and relatively trivial, that pericarditis *per se* would not account for the usual symptoms recorded in the textbooks as characteristic of this disease, but that the common severe symptoms were rather due to the primary condition which gave rise to the pericardial involvement. Pericarditis is often found post mortem in cases in which no symptoms were referable to the condition during life.

Proceedings of National and Local Societies

THE NEW YORK ACADEMY OF MEDICINE.

Stated Meeting Held December 6, 1917.

The President, Dr. WALTER B. JAMES, in the Chair.

General Diagnostic Study by the Internist.—

This address, which will appear in full in the *NEW YORK MEDICAL JOURNAL*, was delivered by Dr. LEWELLYS F. BARKER, of Baltimore, and illustrated by lantern slides. The subject in which most physicians showed greatest interest was that concerned with the work that they were doing day by day, and the way in which others performed similar work. Therefore, the speaker had decided to take for the subject of his address an explanation of the method he pursued in conducting a diagnostic study of his patients. In this method reflective thinking was applied to the diagnostic problem as well as medical knowledge. In confronting such a problem, it was the province of the internist to act as a centre, surveying the body as a whole and summoning to the contribution of the whole the aid of such specialists whose field was limited to a single part of the body. The internist should know enough about each specialty to judge of the significance of the reports of the specialists to aid him in confirming or altering his tentative diagnosis.

There were five steps in the application of the process of reflective thinking to the making of a diagnosis. The first step was to regard the patient as a special problem whose solution depended on scientific study. A tentative diagnosis might be recorded, but snap judgment was to be avoided. A complete history should be taken and all the symptoms carefully recorded. The second step was a localization and definition of the facts in the case. The facts gathered from the history were set down as well as those from the general physical examination and all the laboratory tests, x ray, etc. The third step was to send the patient to such specialists the value of whose opinion seemed to be indicated. The fourth step was to apply the process of inference to the facts deduced, making a rational elaboration of them. The fifth step was corroborative.

Dr. SAMUEL J. MELTZER, of New York, said that he himself could not claim to be an internist; for many years the laboratory had been his working place. It happened, nevertheless, that even now he had to see a patient once in awhile when it took him more than an hour to come to a definite conclusion in a single case, even without employing the scientific and complex method advocated by Doctor Barker. In the eighties he often had to see thirty and more patients a day and wondered how he could have accomplished it if he had followed Doctor Barker's method. The majority of this big audience consisted of practitioners who were now in the same position he used to be thirty years ago. Were they to employ the method recommended by Doctor Barker? Perhaps he might be permitted to narrate a single experience. In 1888 he took his assistant, a well informed man, to see a patient, de-

siring to see him make the examination and arrive at a diagnosis. The examination was made by the assistant in as thorough a manner as the methods of that time permitted. The patient had a temperature of 104° F. and a pulse of over 130; his predominating complaint was excruciating backache. In the consultation that followed the assistant stated that he could not localize the cause of the disease but recalled that severe backache occurred in smallpox. Doctor Meltzer was dumbfounded and went back to the patient, put his finger on the region of the submaxillary gland and the patient responded with evidence of pain. Looking into the throat, it was found that the right tonsil was swollen and dotted with spots. The diagnosis was of course tonsillitis. The assistant wished to know what suggested the submaxillary gland. The answer was that in observing the patient he appeared to fear to swallow and when he had to do so it was accompanied by contortions of his right face, that it was the beginning of winter, and that there were many cases of tonsillitis in the vicinity. On the other hand, the idea of smallpox had not suggested itself although it was well known that many adults who suffered from this disease complained severely of backache. Why was not the possibility of this disease thought of and effort made to exclude it? Because the mental process which the speaker employed in making a diagnosis was very simple. He thought first of those diseases which at a certain season and in certain localities occurred ninety-nine times in a hundred and looked first for their manifestations. Only when they did not appear did he begin to pay attention to the remaining one or two per cent. of possibilities. This method might appear to be very unscientific, and he confessed that his main interests were in scientific methods and investigations. But at the bedside he was the practitioner; he did not look for the exceptional and was carefully on his guard against notions which did not possess a permanent practical value. The history of medicine was full of such phenomena. In brief: For the vast majority of cases a correct diagnosis was more liable to be made by a trained physician possessing a critical mind who went straight for the most probable point, than by one who attempted in all cases to reach that point by the process of exclusion of all other possibilities which rapidly became more and more numerous.

Dr. CHARLES L. DANA, of New York, expressed his appreciation of Doctor Barker's address as an admirable stimulus to the study of cases. As a neurologist, however, he objected to being classed so low down among the group of specialists. The neurologist also summoned the internist to him to aid in arriving at a diagnosis, at which time the internist could also be regarded as a specialist. There were many others in the group Doctor Barker put down as specialists who also gathered the data around them, as he had shown should be done. One thought suggested by Doctor Barker's exposition, was the long distance that lay between the

very complete studies outlined by Doctor Barker and the very limited work that could be done in the average outpatient department or general dispensary. Here one or two men might have to see over sixty patients in two hours. This drove home the thought that such examinations as Doctor Barker outlined ought to be made more accessible and cheaper than they were now. This task should be undertaken by dispensary and hospital managers and those interested in matters of public health and social progress as well as by the medical profession.

Dr. M. ALLEN STARR, of New York, shared Doctor Dana's indignation at being relegated to the lower level of the diagnostic class. Seriously speaking, he did think that such cooperative work as Doctor Barker had suggested was only possible in a well organized hospital or dispensary. In two or three hospitals that he knew of in New York there was combined work of this character. He had had the pleasure of being consultant in neurology to a number of hospitals for many years and he knew that at the Presbyterian Hospital consultations of this character had been carried out for a long time. At the present time at the Vanderbilt Clinic the work of the different departments was coordinated by a system of cards, the patient being referred from one to another as indicated, finally getting a very complete record. The neurological department, for example, was constantly in connection with the ophthalmologist, the rhinologist, the internist, radiographer, etc., when there was need of these special observations. The method Doctor Barker had described and elaborated in the lantern slides was the one every man who was properly taught was trained in, careful, deliberate, balanced judgment of all the findings.

Dr. RUFUS COLE, of New York, reflected, apropos of Doctor Dana's remark that it was a far cry from the methods which the dispensary physician of necessity employed to the elaborate one outlined by Doctor Barker, that it was doubtful if the economic advantage was with the former, and he wondered if the more complex but more accurate method was impossible in the dispensary. From his own experience in dispensaries, he was convinced that the methods usually employed were very wasteful; the physician's time was wasted when he was required to examine large numbers of patients very superficially and the patients got little or no benefit. When these patients returned time after time, or went from dispensary to dispensary, as was often the case in large cities like New York, the economic waste was very great. To change this system required only proper organization. Possibly the admirable method described by Doctor Barker, which appeared so expensive, might after all be the cheapest.

Dr. EMANUEL LIBMAN, of New York, understood that Doctor Barker, in presenting his scheme, did not mean that it was intended for simple cases in which the diagnosis could be cleared up rapidly; he was no doubt referring to cases difficult for diagnosis, and particularly to those which came to the internists from a distance and which must be studied in great detail. Frequently some of the

special examinations, not absolutely essential, were demanded by the patient or his physician. At times these patients came from out of town and unnecessary x ray examinations must be made because the physicians sending the patients would not regard the report as complete without such examinations, and would then send the patient somewhere else to have the radiogram taken. Often, however, a complete study of a case in such fashion as Doctor Barker described would be found of great value in discovering conditions existing in the patient apart from the symptoms from which he was suffering when he came for examination.

In order to investigate thoroughly cases coming to the hospitals and dispensaries for study, it would be necessary in the future to have such institutions reorganized on the plan of the Mayo Clinic, having a chief under whom a large group of men worked who examined the cases. This was not easy to introduce in many institutions at the present time because not all the men connected with the hospitals could fit into a diagnostic group or groups. Until the trustees of hospitals grasped the situation and had the courage to reestablish their staffs on a proper basis, such diagnostic groups would have to be privately organized. No less an authority and no less a distinguished surgeon than Dr. William J. Mayo had stated that he believed that the head of all general hospitals should be an internist with a staff of men working under him, and that the patients should be presented to the surgeon for his opinion and action after the preliminary investigations had been carried out. Doctor Barker would be glad, no doubt, to hear that Doctor Mayo agreed with him in considering surgery a branch of therapeutics.

Dr. VIRGIL P. GIBNEY, of New York, specialist as he was, appreciated the need of a thorough examination in his line of work such as Doctor Barker described. He thought it a good plan for a young man starting out in the practice of medicine to spend some of his time, while waiting for patients, studying at the clinics of different specialists to make himself acquainted with them all. He should visit for a period in turn a neurological clinic, an ophthalmological clinic, etc., and in this way he would get a grasp of the situation as a whole and would not need quite so much help from the different men specializing in other branches; it would also enable him to gauge the value of their opinions in consultation.

Dr. WILLY MEYER, of New York, had been particularly impressed with the system that was followed up with the filling out of printed forms in every instance. Surgeons were often called upon to assist in diagnosis, usually in the so called borderline cases. And what had not become a borderline case today? Of course the typical "internal" diseases were excluded, but all the diseases of the large cavities, cranial, abdominal and thoracic, came here into question. Of the many discoveries to aid in diagnosis of the last ten years, none had done more than radiography. With its aid, particularly the diagnosis of gastrointestinal diseases and of the organs connected with the gastrointestinal tract, had

made great progress. Doctor Einhorn's duodenal bucket had also done much to aid in the diagnosis of the diseases of the latter, such as gallbladder, bile ducts, and pancreas. In the hospitals with which the speaker was connected they had added to the blood and urine analyses the routine examination of the bile and pancreatic secretion as they were discharged physiologically into the duodenum. Today one could certainly diagnose more strictly many diseases before attempting to treat them with the knife. A case was gone over by all the specialists and a conclusion was reached before entering, for instance, the thorax. New York was not behind Baltimore. For years the method as outlined by Doctor Barker was followed with private cases and the ward cases in many of the hospitals. If necessary, every specialist connected with the hospital was called in to examine the case and give an opinion. Then, by combining, a diagnosis was arrived at. The difficulty lay with the semiprivate patients. The ward cases were as well treated as the most wealthy; and if private patients could not afford to pay for the required tests the speaker had never found his colleagues unwilling to reduce their fees or to make a charge within the patient's power to pay. There should certainly be a "diagnostic clinic" for these semiprivate cases who were too proud to become ward patients and yet could not stand the expense in the private buildings. They should occupy a special building in every hospital where a group of men would then combine in working out the refined diagnosis for the benefit of these patients.

THE AMERICAN LARYNGOLOGICAL ASSOCIATION.

Thirty-ninth Annual Meeting, Held at Atlantic City, N. J., May 28, 29, 30, 1917.

The President, Dr. JOSEPH L. GOODALE, in the Chair.

(Concluded from page 238.)

Surgical Treatment of Goitre.—Dr. J. E. MACKENTY, of New York, emphasized the need of laryngologists, and especially the younger men, taking surgery of the neck. He considered all treatment with rest as a basis as deceptive, and the delay involved pernicious. He did not, however, advocate surgery in all cases. In all progressive cases, short of advanced toxicosis, some surgical effort should be undertaken, such as boiling water injections into the gland, ligation of one or more poles, removal of half the gland, with or without ligation of the remaining poles, etc. In well developed and progressive toxic goitre nothing short of the ablation of three fourths to seven eighths of the gland could be relied upon to effect a cure. No operation should be considered until the patient had been under observation in bed for a length of time, and had undergone a careful general examination. Clinical calorimetry was now used to differentiate the active periods of the disease and to determine accurately the degree of benefit from any surgical or medical treatment. Early operation was most important. Local anesthesia should be rarely used, and never for an extensive operation. Deep anesthesia was not requisite. Rapidity of technic must be combined

with gentleness of manipulation or it was valueless. The four important points to be considered were: the parathyroids, recurrent laryngeal nerves, hemorrhage, and the amount of gland tissue to be removed. Free drainage with a liberal opening was important, and permitted continuous saline irrigation through the tubes, which was often exceedingly valuable. Thyroidemia might be avoided by attention to the following points: careful preliminary treatment, rest, overfeeding, etc.; the reduction to a minimum of fear on the part of the patient, light anesthesia, nontraumatic surgery, the judicious selection of the proper operation and correct time of operation; alkalies and water before operation, etc. The following types of hyperthyroidism were bad risks: 1, where the disease is progressive in spite of rest; 2, cases showing no remissions; 3, appearance of psychosis; 4, very active symptoms in cases with small glands; 5, marked exophthalmos. No case should, however, be refused some form of surgical help, providing it could be established that the disease was not in its terminal stage.

Dr. JOHN F. BARNHILL, of Indianapolis, said that in operating on the thyroid every precaution must be taken to preserve the parathyroids. This was best done by leaving a portion of the capsule posteriorly. The capsule in this operation must be borne in mind more than anything else, and if one lost his capsule and worked outside the glandular capsule, he was lost for the whole operation. He could not be certain whether he would injure the nerve or remove one or more parathyroids. Hence, his procedure must keep the surgical and glandular capsule in mind all the time, and if he worked between them it was almost impossible either to injure the recurrent laryngeal nerve or to take away the parathyroid glands. There were often other glands involved with the thyroid and that fact should be ascertained before operation, for the removal of a toxic thyroid did not in such instances cure the case.

Dr. THOMAS HUBBARD, of Toledo, stated that he saw many of these cases before and after operations with reference to voice interference and difficulty in respiration. Fortunately, most of the cases in which there was an impairment of the vocal action, usually unilateral, improved within a reasonable time after operation. In others a supplemental action took place in the opposite vocal cord, ultimately producing good voice but with permanent impairment of movement of the cord on one side.

Dr. HARMON SMITH, of New York, had tried to ascertain in how many cases the nerve was involved previous to or during the operative procedure. He had reached no decision which enabled him to make any statement relative to the positive number, but a great many were involved previous to the operation. There was a paresis and not a paralysis.

Doctor MACKENTY, closing the discussion, stated that the reason for tubes was that when you took out more than half the gland the trachea divided the field. If complete drainage was to be secured, you must put a tube on either side of this tube. He believed the involvement of the laryngeal nerve interfered to some extent with the finer quality of the voice, as for singing or public speaking. He

had injured the nerve on one side and impairment of the voice had followed for a fair length of time, which was always recovered from, so far as speaking was concerned. The Mayos reported a considerable percentage of nerve involvement before operation. Doctor Mackenty examined cases carefully, and had not been able to corroborate this. In a few cases there seemed to be some lack of proper tone or movement of the cord, but not to the extent the Mayos reported.

Amputation of the Epiglottitis for Tuberculosis.—Dr. LORENZO B. LOCKARD, of Denver, stated that amputation of the epiglottitis was as safe a procedure as tonsillectomy. In over 400 cases, in the majority of which vitality was reduced to the lowest ebb, not a single direct fatality resulted. The objection most frequently advanced was that no operative procedures were justified unless the lesion was so circumscribed as to be capable of complete excision. It must be borne in mind that in nine cases out of ten the sole object was palliation, and usually in patients upon whom all other methods of treatment have failed. Even when a cure was considered possible, removal of all involved tissue was not invariably essential to success. It had been demonstrated repeatedly that when an epiglottitis was universally infiltrated, and only the upper half or two thirds was removed, the stump rapidly receded to normal. It was rare that the disease recurs in the stump. Healing of the stump was usually rapid and complete, regardless of the extent or rapidity of progress in the complicating pulmonary and laryngeal lesions. Hence the advisability of operating in this manner hinged upon two questions: In incurable cases what amount of relief might be anticipated, and in cases otherwise hopeful, what influence would the operation have upon the accompanying laryngeal lesions?

A number of patients were now living upon whom the operation was performed from ten to twelve years ago as a palliative procedure, and in whom the resultant unexpected improvement in lungs and larynx was so complete that eventual arrest ensued. The improvement in accompanying lesions could be ascribed in large part to the same influence that occasioned pulmonary betterment: the removal of pain, increase in nourishment taken, improved sleep, and lessened cough. Another important factor was the increased accessibility of the larynx to treatment. After the epiglottitis was removed it was often easy to destroy by galvanocauterization lesions that were previously completely hidden. It was a fact that a surprising subsidence in these accompanying processes was frequently observed. The chief indication for amputation, however, was and must remain, the relief of pain, without thought of the eventual cure of either laryngeal or pulmonary diseases.

The one great contraindication, in the author's experience, was that form of epiglottic involvement, either infiltrative or ulcerative, in which the process was beginning to involve the base of the tongue or the pharyngoepiglottic folds. The entire lateral walls and base of the tongue might and usually did break down within a few weeks after the very first signs of disease became manifest. In these cases only was amputation absolutely contraindicated. In

all others, if pain existed and was uncontrollable by other treatment, excision was advisable. No bad effect upon the general health had been observed. Complete anesthesia could be obtained, and the operation itself need not, in the average case, require more than a half minute.

Ozena and Asphyxiating Gas.—Dr. MARCEL NATIER, of Paris, France, presented the history of a young soldier which went to prove conclusively that ozena was but a local manifestation of a constitutional condition, a fact which he had repeatedly maintained in previous communications. In October, 1915, a soldier, twenty-four years of age, who had always been in perfect health, no hereditary or venereal affection, received five bullet wounds and was rendered unconscious by a bomb of asphyxiating gas. His mask had dried up and was valueless. He recovered consciousness only to fall into repeated syncope. He was carried to the rear, transferred to Vitry le François, where he had to remain three weeks because of his febrile condition. He suffered most excruciating pains from his nose to the bifurcation of his bronchi, and received special care. Five weeks after the accident he was removed to Paris to a base hospital where he remained six months. During all this time he could not swallow except with most excruciating pains. He then was admitted, March 18, 1916, to the Salpêtrière, where his extreme muscular weakness, respiratory troubles, ozena, and vomiting were noted. On October 25th the writer first saw him, and noted remarkable collapse of both *alæ*, active ozena, and marked anemia. The collapse of the *alæ* caused insomnia and mouth breathing, with pain. To relieve this the patient put pieces of a match in each nostril on going to sleep. The ozena was noticed three or four months after the accident for the first time. Irrigations with warm salt water, while causing pain, was followed by amelioration. As the patient was always well until his injuries, the writer felt justified in tracing the cause of his ozena to the asphyxiating gas and the subsequent functional disorders.

Doctor Natier said, in his opinion, ozena was not a true morbid entity, idiopathic or real, but a unique and always a symptomatic expression of a profound localized disturbance of the general health. We were compelled to discard the various more or less fantastic theories, and in particular the microbic theory, invoked to explain the production of ozena.

Laryngoepiglottidean Cyst.—Dr. MAX A. GOLDSTEIN, of St. Louis, reported the following case: A boy, twelve years old, came under observation September 27, 1915. Had been hoarse since he was one month old. This hoarseness had been ascribed by family physician to a "cold." No laryngological examination had at any time been made. The condition seemed to remain quiescent all these years until shortly before the boy was brought to the writer for examination, at which time he had become very dyspneic. The dyspnea was marked; the patient was anemic and frail, not cyanotic, and unable to speak above a whisper. There had not been much difficulty in swallowing and there was no regurgitation of food. Laryngeal examination showed a mass the size of a walnut on the left side,

involving the laryngoepiglottidean region. There was no fever. The mass was yielding to touch and could easily be palpated with the finger. It was incised, the contents consisting of clear, yellow, sticky fluid. Subsequent examination of vocal cords, examination of which was heretofore impossible because of obstruction of view by the mass, was negative. The boy regained the use of his voice, though through habit he would speak in an undertone. There was no recurrence of cyst to date, and the boy now spoke in normal voice.

Book Reviews.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

Physical Diagnosis. By W. D. ROSE, M.D., Lecturer on Physical Diagnosis and Associate Professor of Medicine in the Medical Department of the University of Arkansas. Two Hundred Ninety-four Illustrations. St. Louis: C. V. Mosby Company, 1917. Pp. 499. (Price \$4.00.)

There is little room for originality in the writing of a volume on physical diagnosis because of the nature of the subject and of the fact that so many good works on the subject are already extant. Rose has, however, struck a new note in his presentation which should prove most helpful to the student and physician. It consists in the placing of physical diagnosis clearly and admittedly on the basis of the anatomy of the part or organ to be considered. Before discussing the physical signs of the respiratory tract, for example, he gives a brief and clear review of the clinical anatomy of the organs and their relations to the surface of the chest. Next he takes up a discussion of the various normal and abnormal physical signs themselves, and last he discusses the several diseases of the organs with reference to the physical signs which each produces. This plan is followed throughout the book as far as possible and does much to make the matter of physical diagnosis clear and more readily understood, as well as making for greater facility in correlating the signs found with their probable causes. Aside from this excellent plan of presentation, the book can be recommended as well written, well illustrated, and thorough. One who is seeking a practical work on physical diagnosis would not make a mistake if he chose this book by Rose in preference to several of the old and better known volumes.

A Practical Dietary Computer. By AMY ELIZABETH POPE. New York and London: G. P. Putnam's Sons, 1917. Pp. v-170. (Price \$1.25.)

Miss Pope's latest contribution to a growing literature for nurses will be a valuable supplement to her *Essentials of Dietetics*. She seems to have avoided successfully a too deep scientific discussion and to have given essential practical facts. The book consists almost entirely of tabulations and computations of material representing those phases of dietetics with which the nurse is most likely to be confronted and with which she should be familiar. The first part covers the subject of food requirements, including tables from government documents, life insurance reports, standard textbooks, etc. The material seems to be arranged simply, clearly, and with due regard to the limitations of its application in the hands of nurses. Part II includes tables showing the chemical composition and caloric value of common foods and beverages; tables showing the cost, chemical composition, and caloric value of some special diabetic foods; and a table showing the average relative carbohydrate content of foods. Some of the material is drawn from United States Department of Agriculture bulletins and from other authoritative sources, and represents a good selection of data for the purpose. Part III is entitled Weights and

Measures and Computed Recipes. Avoirdupois weight, apothecaries' weight, metric equivalents, and domestic measure are given. The recipes are intelligently selected and clearly set down in tabular form. Parallel columns give the actual weight in grams of protein, fat, and carbohydrate constituents with a fourth column giving caloric equivalent. Briefly, we believe that this little dietary computer presents reliable information and should be of practical help to an intelligent and well trained nurse and should have a place in the training school library.

Hysteric, pithiisme, et troubles nerveux d'ordre reflexe en neurologie de guerre. Par J. BABINSKI, Membre de l'Académie de médecine; médecin de l'Hôpital de la Pitié, et J. FROMENT, professeur agrégé médecine des Hôpitaux de Lyon. Dernière édition revue et augmentée. (Collection horizon précis de médecine et de chirurgie de la guerre.) Paris: Masson et Cie., 1918. Pp. 295. (Price 4 fr.)

In a previous issue of the first edition of this work by Babinski, we have had cause to say that Babinski's contributions offer little or nothing to the interest of the hysterical problem by his erection of a new entity, which he terms pithiisme, namely, a disease which is caused by suggestion and can be cured by persuasion. The modern student of medical phenomena finds nothing dynamic in such a discussion and no student of energetics who has completed the study of the activities of the human body can obtain from this book any fundamental philosophical concepts of any value. On the other hand the clinician will find any number of extremely interesting descriptive points well illustrated and admirably outlined. To the student of the deeper psychology, independent of the particular phase in which it may be presented, Babinski's conception is superficial and static.

Births, Marriages, and Deaths.

ANDERSON.—In Brooklyn, N. Y., on Wednesday, January 30th, Dr. Peter Anderson, of New York, aged thirty-nine years.

BANBURY.—In Brooklyn, N. Y., on Monday, January 28th, Dr. Reginald M. H. Banbury, aged forty-two years.

BELLINGER.—In Fort Riley, Kan., on Thursday, January 17th, Dr. Ivan Ellsworth Bellinger, of Sweet Home, Ore., aged thirty years.

BURGE.—In Iowa City, Ia., on Saturday, February 2d, Dr. Albertus Joseph Burge, aged forty-six years.

BURTON.—In Blue Earth, Minn., on Friday, February 1st, Dr. Charles Newell Burton, aged fifty-two years.

DILLMAN.—In Connersville, Ind., on Friday, February 1st, Dr. Luiton D. Dillman, aged seventy-two years.

ELLIS.—In Poultny, Vt., on Saturday, January 26th, Dr. Edward Dyer Ellis, aged sixty-seven years.

EMERSON.—In Columbus, Ohio, on Saturday, January 26th, Dr. Harley Howard Emerson, aged forty years.

FERNANDEZ.—In New York, N. Y., on Friday, January 18th, Dr. Jose Florencio de F. Fernandez.

HAMMOND.—In Philadelphia, Pa., on Tuesday, January 22d, Dr. William Nelson, Hammond, aged forty-four years.

HOGG.—In Rayland, Ohio, on Sunday, January 20th, Dr. William D. Hogg, aged fifty-four years.

HULL.—In Augusta, Ga., on Sunday, January 27th, Dr. Elmer S. Hull, of Montgomery, Pa., aged fifty-six years.

MAYS.—In Richmond, Ky., on Thursday, January 24th, Dr. Nelson Mays, aged seventy-six years.

MAYS.—In Philadelphia, Pa., on Thursday, February 14th, Dr. Thomas J. Mays, aged seventy-two years.

RODMAN.—In Hodgenville, Ky., on Friday, January 25th, Dr. William E. Rodman, aged seventy years.

STOCKLE.—In Ludlow, Pa., on Thursday, January 31st, Dr. Charles Henry Stockle, aged fifty years.

TULL.—In Philadelphia, Pa., on Friday, January 25th, Dr. Montrose Graham Tull, aged fifty-eight years.

WHITNEY.—In Rochester, N. H., on Sunday, January 20th, Dr. Frank Eugene Whitney, aged sixty-four years.

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Original Communications

TOOTH INFECTION.*

Some Case Reports.

BY OLIVER T. OSBORNE, M. D.,
New Haven, Conn.,

Professor of Therapeutics, Yale University School of Medicine.

I have elsewhere (1) urged the danger of neglecting tooth and mouth infection; I have also depicted the prevalence of even perfectly crowned and bridged teeth, on account of the danger from their becoming infected. The danger, also, from pyorrhea alveolaris, pus pockets in the gums, loose teeth, and decayed teeth and roots left untreated must now be recognized by all.

Besides the most dangerous pathological bacteria that may be present, such as the Streptococcus viridans and the pneumococcus, many germs, pus forming, and non pus forming, may be the cause of rheumatism and joint or other disturbances. It is now conceded that arthritis deformans is frequently caused by mouth infection. Malignant endocarditis is also often caused by Streptococcus viridans absorbed from the mouth. The prognosis of this disease is so bad that every time the germ is found in the mouth, the most strenuous efforts should be made to eradicate it. Of course there may be several varieties of this germ, but until we can determine an innocent one—if there are innocent ones—from those that are malignant, such a germ should always be suspected and eradicated if possible. The frequency with which pneumococci are found in infected mouths should suggest an inquiry into the frequency of influenza attacks ending in pneumonia because the pneumococcus is in the patient's mouth; in other words, that he has been a carrier of this germ.

Besides these serious infections, boils, abscesses, and even septicemia and pyemia may be caused by pus germs in the mouth. Treatment of these recurrent boils, for instance, will not be successful until either the source of infection in the mouth is removed, or the patient produces enough antibodies or has the production of antibodies stimulated by the injection of vaccines, autogenous or stock, to combat successfully the infection. The relationship of mouth infection to neuritis, especially of the back of the neck, shoulders, and arms, and even of more distant parts of the body, is now recognized. Of course such infection is not by any means the only

cause of a localized neuritis, but it certainly is a frequent cause. I am convinced that a very large proportion of thyroid disturbance is caused by mouth and throat infection. This disturbance of the thyroid may or may not cause its enlargement, and there may be hypersecretion or hyposecretion as a consequence, the symptoms depending upon which condition predominates. Irritation of this gland may cause the development of cysts, and the gland may become very large, with or without symptoms of hypersecretion. Other glands furnishing internal secretion may be affected at the same time as the thyroid is affected, possibly causing an inhibition of thyroid symptoms. I have seen a number of instances in which, although the thyroid gland was enlarged, there were no symptoms of Graves's disease, and yet as soon as the mouth was clean of infection a typical Graves's disease developed.

That these mouth infections can cause a disturbance of the suprarenal secretion seems to be shown by many instances of greatly increased blood pressure without any evidence of arteriosclerosis or any apparent kidney defect. The suprarenal glands may also be inhibited in their activity as well as stimulated, as very many instances of low blood pressure occur coincidentally with mouth infection. Whether infection in the mouth interferes with the pancreas or with the suprarenals, or with some other factor in carbohydrate metabolism, it is a fact that many instances of glycosuria are associated with such infection. This glycosuria has not polyuria or excessive thirst as symptoms and is generally readily stopped on a diet free from starch. It is not often necessary to place the patient on a starvation diet to eradicate the sugar in the urine; in other words, a real diabetes mellitus does not seem to be present. Patients with glycosuria and with mouth infection are at times cured of the former when the mouth is made clean. What the late future of such individuals is in regard to glycosuria or diabetes, I am not yet able to state.

As we know more and more of the type of disturbance called cardiovascular renal disease, as we have long ago learned of the irritation to arteries and kidneys by toxins absorbed from the intestines, and as we recognize the danger from irritants caused by preserved foods, we must now recognize the possibility, if not the probability, of chronic mouth infection causing the absorption of sufficient toxins or irritants to produce arteriosclerosis and chronic

*Read at the semiannual meeting of the New Haven County Medical Association, at Waterbury, Conn., October 25, 1917.

DISTURBANCES OF THE CIRCULATION ASSOCIATED WITH TOOTH INFECTION

Case	Sex	Age	Condition	Mouth	Bacteria	Treatment	Results
1	M	43	B. p. syst. 245; diast. 140; kidneys normal; hemorrhage into one eye; no history of syphilis. Complete heart block; pulse 28 to 32; mitral leak; edema of feet; dyspnea.	Several crowns; 4 bridges and pus under all bridges. Four infected teeth.	Foul smelling pus.	All bridges removed. Bad teeth removed.	Eye became normal; headaches and dizziness disappeared; sleep returned; b. p. remained high. Heart improved; edema and dyspnea disappeared; patient returned to work; heart block permanent.
2	F	56	Glycosuria but no real diabetes; albumin; myocarditis; meningeal symptoms; terrible dyspnea; anemic.	Many crowned and bridged teeth infected; pyorrhea.	Streptococcus viridans.	Most infected teeth removed; too ill for further dentistry.	Temporary improvement; outcome fatal.
3	M	47	Cardiac dyspnea; heart enlarged; b. p. low.	The only teeth are a few bad ones and decayed roots.		Medicinal and dietary; mouth antiseptics until teeth can be removed.	Great improvement; teeth to be removed; patient lost sight of improvement.
4	M	25	Ill 4 months; tonsillitis; myocarditis; mitral systolic murmur; thyroid enlarged; small glands of neck enlarged; pulse 60; b. p. syst. 140; diast. 90. Tonsils removed three months ago. Recurrent fever; general debility; heart murmur has disappeared; continued leucocytosis of 12,000.	Two infected teeth. X ray showed impacted wisdom tooth and pus sac.		Both teeth removed. Tooth and pus sac removed.	Slow improvement. Continued improvement.
5	M	24	Recurrent inflammatory rheumatism with myocarditis, 10 years' duration; great decompensation; mitral and aortic disease; thyroid enlarged.	One bridge upper jaw; decay and infection of alveolus teeth both sides; pyorrhea lower front.		All teeth removed under local anesthesia.	Patient improved but not heard from later; hopeless case.
6	M	8	Dyspnea; heart enlarged; thyroid enlarged; b. p., syst. 150; diast. 98.	Bridges and crowns both sides lower jaw; pyorrhea lower jaw anteriorly.	Connellan-King diplococcus.	Bridges removed; mouth cleaned.	B. p. dropped to syst. 140; diast. 80, and remains about that.
7	M	57	Progressively worse anginal attacks; pulse very irregular and intermittent, hardly any two beats give the same pressure, ranging from 140 syst. to 40 diast.; heart enlarged; systolic blow at mitral valve.	Upper teeth false; lower jaw a mass of pus and infection.		All teeth removed.	Wonderful improvement. Heart after several months, is perfectly regular in force, and during the warm weather no anginal attacks at all; this fall has slight recurrence of cardiac pains. Pulse perfectly regular in force.
8	M	3	Dyspnea; cardiac weakness, although at times b. p. has been high; anginal pains; pains in knees and feet; throat cough; indigestion.	Two bridges; pyorrhea and pus pockets all over mouth; x ray shows root infection.		Two bridges and eight teeth removed; mouth cleaned.	Cough, indigestion, heart pains, dyspnea, and rheumatic symptoms all disappeared. Man well without any other treatment.
9	M		Persistent cough; weak and debilitated; mitral sounds rough; heart hypertrophied; b. p., syst. 155; diast. 100.	Two crowns; two infected roots.		Ordered mouth surgically cleaned.	Patient not again seen.
10	M		Rheumatic fever at 25 years of age; sick 3 months; aortic aneurysm. Wassermann positive.	Both jaws a mass of pus foci.	All kinds of pus germs and Connellan-King diplococcus.	Too ill for surgical treatment.	Death by rupture of aneurysm.
11	M		Bad acting heart of many months' duration; one neglected tooth extracted, with evacuation of pus; some enlarged glands of the neck.	Several crowned teeth; x ray shows several must be removed.		Mouth surgically treated.	Complete recovery; all cardiac symptoms and debility disappearing.
12	M		Recurrent tonsillitis and some rheumatism; valvular disease of the heart; progressive irregular fever of several months' duration.	X ray shows apical disease of a tooth.	Streptococcus viridans cultured from tooth and in blood.	Fatal.	
13	F		Aortic and mitral disease; never any real rheumatism; heart pains. Malignant endocarditis.	Pyorrhea and diseased teeth.		Teeth removed and gums treated.	Condition improved.
14	M			A large number of crowned and bridged teeth.	Streptococcus viridans in the blood.	Fatal.	
15	M	38	Passed for insurance one year ago; now rejected on account of heart murmur; has a systolic blow at apex; heart not enlarged.	Three badly decayed teeth and a bad looking crown, lower jaw.	Culture shows streptococcus viridans and pneumococci.	Mouth surgically cleaned.	Heart murmur disappeared.
16	M	27	Double aortic and double mitral murmurs; decompensation.	Very serious pyorrhea.			Case seen in consultation, and results not known.
17	F	3	Palpitation and debility.	Always had trouble with teeth; many overfilled and crowned teeth; all upper front teeth pivoted.		X ray pictures advised.	Patient not again heard from.
18	M	4	Mitral and aortic disease; b. p., syst. 128; diast. 0; general condition bad. Four teeth have fallen out lately, some of them molars; irregular temperature.	Four badly decayed teeth with pus; one bad root.	Streptococcus viridans cultured.	Ordered teeth removed.	Patient seen in consultation and not again heard from.
19	M	48	Badly acting heart and heart murmurs; some symptoms of cardiac insufficiency.	Bad pyorrhea.		Mouth cleaned.	Great improvement; all heart symptoms disappeared; recurrent pyorrhea; recurrent symptoms; mouth recleaned; symptoms disappeared.
20	F	20	Sick 6 months; been in several hospitals; pericarditis; heart tapped; acetate; several tapings. Never had rheumatism, chorea or joint pains. Pericardial rub; large amount of effusion in abdomen; condition exceedingly serious.	Full of decayed, broken down teeth, and one dirty bridge.	Streptococcus viridans cultured.		Unknown; case hopeless.

nephritis. We must recognize the enormous increase in heart affections and in bloodvessel disease that is shown by the statistics of the last twenty-five years, and this has been the period in which

more crowns and bridges have been placed in the mouths of the civilized human race. Consequently, it is too much to assume that many of the functional disturbances of the heart and much of the

DISTURBANCES OF THE THYROID ASSOCIATED WITH TOOTH INFECTION

Case	Sex	Age	Condition	Mouth	Bacteria	Treatment	Result
17	F	24	Overweight, gained 27 lbs. in 5 months. Subthyroid secretion and the usual symptoms; thyroid is enlarged, but undersecreting; body shows adiposis dolorosa distribution of fat; so weak can hardly drag herself around; very scanty menstruation, at times entirely absent.	Capped, bridged, and pivoted teeth, and pus everywhere.		All teeth removed; treatment aimed at subthyroid condition.	Very great improvement in every respect; strength became normal; abnormal deposits of fat disappeared, though the general weight kept up—this is a family attribute; menstruation about normal.
26	F	43	For years has had subthyroid secretion and received thyroid treatment. Twenty years ago weighed 100 lbs.; now 168; all symptoms of subthyroid secretion; trace of albumin in urine, and a few hyaline casts.	Teeth and gums show bad infection; says she does not believe there is a sound tooth in her head. X ray shows many teeth in serious trouble.		Refused to have crowns and bad teeth removed.	Thyroid treatment gave the usual general improvement. On ceasing treatment, within a few months, became worse than at first. Hands and face swell; pale, anemic, excessively weak. Passed out of my jurisdiction.
28	M	59	Well up to a few months before I saw him; then had a serious heart condition with decompensation, edema; in bed several weeks. Pulse 120; b. p., syst., 170; diast., 90; aortic and mitral systolic blows; trembly; nervous; breathless; flushes; can hardly walk about; thyroid perhaps slightly enlarged.	Many badly infected teeth and pyorrhea.		Mouth surgically cleaned under local anesthesia.	Within a week patient had a pulse of 140; marked exophthalmos; greatly enlarged thyroid; trembled, nervous, irritable—typical Graves's disease—but heart strength improved; mitral blow disappeared. Under treatment for Graves's disease rapidly and continuously improved, and now for 8 months has been working and is apparently as well as he ever was.
33	M	46	Palpitation on least exertion and pain left shoulder and down arm, growing worse. Never had rheumatism. Thyroid enlarged; heart rapid.	Several bad teeth with ulcerations at roots.		Mouth surgically treated.	Patient rapidly improved; all heart symptoms and rapid pulse disappeared.
35	F	47	General debility following a pneumonia.	Two bad roots; one bridge with suppurating gum.		Mouth surgically cleaned.	Soon after the operation, developed all the symptoms of hypersecretion of the thyroid. Patient slowly and progressively improved; thyroid symptoms disappeared.
46	F	54	Had a very large cystic goitre which developed rapidly 3 years ago. Dyspnea; dizziness; some cardiac pains.	Eight loose teeth, due to pyorrhea.	Culture shows pus germs and streptococcus viridans.	All bad teeth removed.	Recent case; patient at a distance; present condition unknown.
51	F	42	Well until 6 months ago; then began to have night sweats and lose weight; then had endocarditis, sick 2 weeks. Now beginning symptoms of Graves's disease; systolic blow at the apex, and an aortic systolic murmur, but heart not much enlarged; thyroid enlarged; some exophthalmos.	Two crowned and five bridged teeth; most of upper front teeth pivoted; lower teeth false.			A recent case; teeth to be removed.
55	M	47	Hyperthyroidism 2 years ago; improvement. Now recurrence; pulse 125; thyroid enlarged.	One suppurating crowned tooth and four badly decayed roots; one bridge.	Culture shows only harmless bacteria.	Mouth surgically cleaned.	Rapid improvement; in ten days heart was normal in rate.
66	F	44	For many years has had subthyroid secretion.	Several crowns and two bad teeth.		Mouth surgically cleaned.	Too recent a case to note outcome.
70	F	32	Graves's disease with all the symptoms, including marked exophthalmos; pulse, 144.	Two bridges; a bad root, and a front tooth with pus		All infected teeth removed.	Four days after the surgical treatment, pulse, 120; 7 days after, pulse, 108; 14 days after, pulse, 100; 21 days after, pulse, 96; 35 days after, pulse, 88. Exophthalmos all but gone; goitre diminishing in size. From almost complete disability, patient is able to attend to all her duties.

chronic myocarditis may be due to infected mouths, as we so well know that serious endocarditis can be caused by some of these mouth germs?

Whether some of the localized inflammations are caused by focal infection in the mouth, I will leave for future investigations and for the accumulation of statistics, but let me state that many times ulcer of the stomach, ulcer of the duodenum, gallbladder inflammation, acute appendicitis perhaps of the fulminating variety, acute infection of the kidneys, and thrombosis of some vessel during a simple illness have been found associated with tooth and gum infection, to say nothing of infection of the tonsils.

Doubtless many have examined during this last summer the young men from twenty-one to thirty years of age who were drafted for the United States army. One was there compelled to investigate carefully the condition of the teeth. I will warrant that there was not a single physician who made such examinations who was not astonished at the amount of tooth defect and gum infection found in these men in

the very prime of life. I trust we have reached the age when a patient, after visiting several physicians, can no longer say, "Doctor, you are the only one who has looked into my mouth." Also I hope we have reached the stage when a dentist will never again say to his client, "That tooth ought to come out, but we can attend to that any time within a few months"; or that a dentist will decide, either himself or by consultation with the patient's physician, and by the aid of x ray pictures, that several teeth are sources of infection, and then remove at that particular period but one tooth and leave the others. What surgeon would ever eradicate one source of infection and leave two or three other sources of the same or other infection? Also I trust we have reached the age when it will be recognized by all dentists, as many now do recognize and whose papers on the subject I have read, that crowns to the gums are rarely excusable, and that bridges to the gums are rarely justifiable. Aseptic bridges can be built, or removable plates can be used. Some den-

UNCLASSIFIED ABNORMAL CONDITIONS ASSOCIATED WITH TOOTH INFECTION

		Condition	Mouth	Bacteria	Treatment	Result
					Tooth removed.	General condition greatly improved, but patient has always been neurotic, and will doubtless continue to have trouble.
1	F	41	All lands of nervous and digestive disturbances. Appendix has been removed; no improvement. Dates disappear from time when she had a tooth crowned at 16 years of age.	X ray shows this crowned tooth is diseased	Tooth removed	Positive improvement; but there will doubtless be a recurrence of mental disturbance.
2	M	41	For many months has had periods of depression, with brain storms, terrible explosions of temper. A very tall, well built man with a syst. b. p. of 100.	One sore crowned tooth; pus sac at its base	Tooth removed	Angioneurotic swellings did not again recur—they were probably due to anaphylaxis. Under autogenous vaccine made from the mouth cultures rheumatism disappeared.
3	M	61	Perfectly well until 4 years ago, when he had an appendectomy; the following year began to have rheumatism in feet and knees and in shoulders; 2 1/2 months ago began to have angioneurotic edemas of the mouth, tonsils, tongue, and sides of face; sometimes cannot keep his tongue in his mouth. At times one foot swells at the same time that mouth swells. A large, heavy man with syst. b. p. only 122	Very bad pyorrhea alveolaris and inflamed, angry gums	Mouth surgically cleaned	Angioneurotic swellings did not again recur—they were probably due to anaphylaxis. Under autogenous vaccine made from the mouth cultures rheumatism disappeared.
4	F	50	Nervous; hysterical; neurotic.	A mass of infected teeth; ulcerated and purulent gums.	All teeth removed.	Marked general improvement
5	F	35	Neurasthenia; has been at sanatoriums; almost on the verge of melancholia.	Pyorrhea and many infected teeth.	Finally teeth were removed	Patient absorbed toxins sufficiently to develop hyperthyroidism symptoms which she had not previously had. In many respects patient improved, but mental condition when last seen was still neurasthenic and more or less melancholic.
6	M	30	Has gastric ulcer and hemorrhages; a pustulant acne on abdomen and back; a systolic blow at the aortic orifice.	Tooth abscesses and pyorrhea.	Mouth surgically cleaned; ulcer of stomach treated.	Patient recovered. Of course the ulcer may relapse.
7	M	51	Bronchitis and serious asthma; heart enlarged, intermittent; mitral systolic murmur.	Pyorrhea alveolaris; one infected crowned tooth.	A nasal polyp was removed; bad teeth extracted; pyorrhea and general condition treated.	Marked improvement.
8	F	55	Several operations on nose to prevent hay fever. Neuritis in left arm; pain in both wrist joints.	Gums swollen; infection under crowned teeth; pyorrhea.	Mouth surgically cleaned.	A troublesome cough disappeared; nasal congestion improved; neuritis improved; but pain in wrists did not improve.
9	F	40	For several years has had attacks of intense pain, left side of head; flushing of the face scarlet; hands and arms become dark crimson; cannot sleep; symptoms somewhat similar to Raynaud's disease.	Has 22 crowned, bridged, or capped teeth; angry looking gums; pyorrhea.	Advised surgical treatment of mouth.	Patient lost sight of.
10	M	61	Some months ago had some circulatory obstruction in his brain and partial paralysis of right side for some hours; speech somewhat affected. Kidneys and heart normal; blood pressure low; very nervous; very weary.	Pyorrhea everywhere.	All teeth removed; mouth surgically cleaned.	Strength, digestion, and mental condition improved.
11	F	54	Asthma; night sweats. Syst. b. p. 100. Some emphysema of lungs. Sputum shows streptococci and pneumococci. Considerable nasal congestion.	Many crowned teeth; two infected	Mouth surgically cleansed; nose treated; patient sent South.	Continuous improvement; entire freedom from asthma.
12	M	42	Has raised blood tinged sputum. Short of breath. Lungs and heart negative.	Badly infected gums; pus trickles beside several teeth; pyorrhea.	Advised surgical treatment of mouth.	Patient seen in consultation and not again heard from.
13	M	12	Absolute blocking from swelling and exudate, of both nostrils, 10 days duration; running a slight temperature.	Four teeth lower jaw in front loose, and gums dripping with pus.	Staphylococci, diplococci, streptococci.	Mouth surgically cleaned
14	F	41	Cough; pain in back between the shoulders and around into abdomen. Nervous prostration 14 years ago, sick 5 months.	A bridge with supuration under it; one pivoted front tooth, and a pus pocket; 2 front lower teeth loose and wobbly.	Pneumococci and pus germs.	Mouth surgically cleaned.
15	F	37	Several nervous breakdowns; neurasthenia; neuritis in different parts of the body; most pain in back and left elbow. Frequent eruptions on body. Subthyroid secretion; overweight; fat deposited as in adiposis dolosa.	Large amount of infection; apices of several teeth badly infected; pus in right antrum.	Mouth surgically cleaned; antrum treated until cured.	Patient at the present time entirely well.
16	F	41	Repeated attacks of nervous prostration; faint spells.	Large amount of infection; pus	Mouth surgically cleaned.	Patient not again seen
17	M	41	Advanced chronic interstitial nephritis; bad heart	A perfectly terrible condition; teeth and gums a mass of infection.	Attempt made to clean the mouth, but too ill for office treatment.	Hopeless case.
18	M	78	Probable carcinoma of the left lung.	A mass of infection.	A large amount of yeast germs.	Consultation case; not again heard from.
19	M	24	Upper abdomen pain for last 6 months; all kinds of diagnoses and treatment.	One loose crown on right side with infection under it.	Advised removal of crown	Patient not again seen
20	M	43	Though a strong, apparently sturdy man, is neurasthenic; feels weary all the time.	One bad tooth which his dentist is trying to save.		Recent case; outcome not known.
21	F	20	Vomiting for 3 weeks. In hospital two weeks; no diagnosis made.	Infected wisdom tooth with pus at its base	Tooth removed, and pus squirted to the root of the mouth.	Improvement immediate. Vomited once after the ether, and not again. Rapid general improvement.

DISTURBANCES OF THE JOINTS AND NERVES ASSOCIATED WITH TOOTH INFECTION.

Case	Sex	Age	Condition	Mouth	Bacteria	Treatment	Result
2	M	36	Neuritis right arm 1 1/2 years; some pains in right knee; 3 years ago recurrent skin infection.	Pyorrhea and one pus tooth.		Two teeth removed and pyorrhea treated.	General condition improved; neuritis of arm improved, but when last seen still had occasional pains in it.
5	F	42	Suffered for years with pains in back of neck and under right scapula. Has subthyroid secretion.	Many sources of infection in teeth and gums.		Surgical treatment of mouth.	General condition improved, and very slow, but progressive improvement in the neuritis.
21	F	34	Pain in both shoulders and down arms; neuritis.	Two crowned teeth; one shows infection.		Tooth removed.	Rapid improvement which had previously resisted various barking and local treatments. Neuritis disappeared.
30	F	45	One year ago sudden unexplainable infection of one eye; eye was removed. Protracted, excruciating neuritis, shoulders and arms.	One very badly infected tooth, upper canine, same side as the eye that was removed. Many pockets of suppuration.		Mouth surgically cleaned.	
32	F	45	Nerve and muscle pains back of neck and down the side; also pains in back, knees, feet, and toes.	Bad suppuration; one incisor has been suppurating for 20 years. Several crowns.		Mouth surgically cleaned.	Patient slowly and progressively improved; all pains disappeared.
42	F	36	Arthritis deformans of some years' duration. All kinds of treatment failed.	All back teeth capped with gold; two suppurating roots.		Mouth surgically cleaned.	Acutely swollen and painful joints all improved, without that kind of recurrence; deformities and strength did not much improve.
43	M	40	Excruciating neuritis of the back between the shoulders.	A number of abscesses at the roots of the teeth; many badly crowned teeth.		Mouth surgically cleaned.	No immediate improvement in the neuritis, and patient passed out of my jurisdiction.
57	F	44	Recurrent joint pains for two years, with more or less local inflammation. Heart very irregular and intermittent, with a systolic mitral blow.	Two infected roots; pyorrhea.	Streptococcus viridans.	Advised surgical cleaning of mouth.	Patient seen in consultation; not again heard from.
58	M	49	Terrible headaches and face aches; fifth nerve apparently in serious trouble. Part of headaches due to eye defects.	A tooth root badly degenerated.		Tooth removed.	Considerable immediate improvement. A recent case; outcome uncertain.
62	M	37	For eight years had neuralgia in back of head and back of neck and between shoulders.	Two infected teeth.	Streptococci, and Connellian-coccus.	Advised to have these teeth out.	Patient not again seen.
72	F	50	Gouty fingers.	Some crowned teeth and a pus pocket at one root.		Mouth surgically cleaned.	Recent case; outcome not known.
77	M	49	Terrible headaches for years, and growing worse; boils, which were improved by autogenous vaccine. Correction of eye defects does not stop the pain.	Pus sac at root of one tooth.		Advised removal of tooth.	Patient seen in consultation; not heard from again.

BOILS AND SKIN ERUPTIONS ASSOCIATED WITH TOOTH INFECTION.

Case	Sex	Age	Condition	Mouth	Bacteria	Treatment	Result
4	F	36	Fine eruption all over body for 3 weeks; pain and swelling one ankle; lump in breast termed beginning cancer.	Three teeth infected; some pyorrhea.		These teeth removed; pyorrhea treated.	Eruption, arthritis, and lump in breast disappeared.
13	M	38	A series of boils, and a carbuncle, for 1 year; first boil came in nose. Palpitation; cough.	Four badly crowned teeth, infected.		All crowns removed.	Cured.
16	M	50	Eruption on face and on body, similar to bromid eruption, semipurulent; enlarged liver; bile in the urine; syst. b. p. 115.	Diseased roots and teeth; pyorrhea.		Infected teeth removed; pyorrhea treated.	Gradual disappearance of all eruption; bile disappeared from urine; liver became normal in size. Syst. b. t., 140.
50	M	36	Recurrent indigestions; headaches; sties; boils; abscesses, all recurrent, and especially recurrent boils and pustules in the nose for months.	One badly infected tooth, and pus.	Staphylococci.	Tooth removed; pus pocket cleaned.	Rapid improvement in every way.
65	M	29	Recurrent boils and one or two carbuncles, for a year.	One infected tooth.		Several other teeth with degenerated roots removed. Tooth removed, and found necrosed at apex.	Consultation case; not again seen.

GLYCOSURIA ASSOCIATED WITH TOOTH INFECTION.

Case	Sex	Age	Condition	Mouth	Bacteria	Treatment	Result
15	F	45	Irregular heart; neuritis; glycosuria but no real diabetes, no thirst, no polyuria. Sugar quickly disappears on modified diet.	Capped, bridged and crowned teeth everywhere; pyorrhea.		The worst teeth removed, but some bridge work that looked healthy was allowed to remain.	Considerable improvement, but no cure. Pyorrhea recurred; the dental surgery should have been more radical. Glycosuria on the least carelessness in diet. Heart strength improved; neuritis recurrent.
44	M	49	Irregular and badly acting heart many times in the last few years. Several attacks of glycosuria during the last 5 years, easily corrected by diet; no diabetes mellitus; no polyuria, no thirst.	Serious pyorrhea alveolaris.		Mouth thoroughly cleaned.	Sugar disappeared from the urine; heart strength increased; soon patient could eat small amounts of starches without glycosuria.
49	M	55	Glycosuria, but no thirst, and no polyuria—not real diabetes. Has lost 13 lbs. in weight in 4 weeks. Sugar easily removed from urine by diet.	Upper teeth false; lower jaw in terrible condition with pyorrhea alveolaris; front teeth loose and decayed.	Ordinary pus germs.	Mouth surgically cleaned; all teeth removed.	Glycosuria disappeared; patient can eat considerable amounts of starches without sugar appearing in the urine.

ists even declare that the teeth used for abutments for bridges will often, perhaps generally, not long stand the strain.

I have histories of about 100 cases of tooth and gum infection occurring during the last year in my private practice. About seventy of these cases I have carefully tabulated, and with your permission will briefly describe a few of them. Of these tabulated cases, twenty-two show disturbances of the heart; four show serious disturbance of blood pressure; twelve show boils, ulcers, skin eruptions or asthma; eleven had thyroid disturbance; ten were seriously neurasthenic; a few showed mild mental disturbance; thirteen had neuritis; four had glycosuria; three had arthritis. Several of these patients had more than one of the above conditions. Please do not conclude that I assert that the disturbances in these patients were in every case due to infection of the mouth. I do assert that serious mouth infection was found in every one of these patients, and that in a large proportion of them it was a large, if not the only, causative factor of their condition.

The physician as well as the patient should distinctly understand that removing the source of infection does not remove the irritation, inflammation, chronic degeneration, or the localized infection of the part that is in trouble. Therefore cleaning the mouth can only be conducive to the patient's future health; it may not eradicate the disease or condition of which the patient complains.

I have heard so many sneers from physicians and so many objections from dentists and from patients who naturally dislike to lose a tooth, that the strongest argument I can present is to ask: Is it esthetic, is it healthful, may it not shorten life to carry in the mouth streptococci, staphylococci, Streptococci viridans, pneumococci, or even perhaps many unidentified germs that do not form pus, but seem to be a cause of some forms of neuritis and some forms of arthritis? In other words, is there any part of the body where the patient, the dentist, and the physician would allow infection to remain if he knew it to be present?

CASE I (51).—A man, aged forty years, had an influenza attack, soon followed by malignant endocarditis. Streptococcus viridans was cultured from the blood. Outcome fatal. This man had a large number of crowned teeth and infected gums.

CASE II (52).—A man, aged fifty-four years, had valvular disease of the heart and more or less acute myocarditis, running a long continued temperature. Streptococcus viridans was cultured from the mouth, from a tooth, and in the blood. Outcome fatal.

CASE III (6).—A woman, aged sixty-five years, had intermittent glycosuria, chronic myocarditis, acute dilatation of the heart, some cerebral symptoms, and a small amount of disturbance of the kidney function. Streptococcus viridans was found in the mouth culture, and in a culture from the root of the tooth which was removed. Blood was not cultured. Outcome fatal.

CASE IV (11).—A man, aged twenty-five years, had an endocarditis following a tonsillitis of some months before. Blood pressure was too high; pulse was too slow; thyroid gland was enlarged; he had a mitral systolic murmur. Small glands of the neck were enlarged. Tonsils were removed three months ago. Two infected teeth were found by x ray, and pus was found on removal of one of them. After several months he had not recovered his health, and was having an afternoon rise of temperature and a leucocytosis of 12,000, and was very weary and weak. Radiograms showed an impacted wisdom tooth and an adjacent pus pocket. This tooth was removed and the

pocket cleaned. There was immediate improvement which has been progressive. The white count has become normal.

CASE V (20).—A man, aged twenty-four years, had had several attacks of rheumatism, serious valvular disease of the heart, and thyroid enlargement. He had pyorrhea, bad teeth, bad roots, and a bridge with a diseased gum under it. He improved as to his general condition after surgical and medical treatment of his mouth, but was lost sight of and the outcome was not known. He was absolutely incurable, with hopeless valvular disease of the heart and broken compensation.

CASE VI (22).—A man, aged fifty-seven years, was suffering from frequent anginal attacks and had a very irregular and intermittent pulse. Pulse pressure was from 140 systolic to 40 diastolic. He had chronic myocarditis. He had worn artificial lower teeth for the last four years; the upper jaw was one mass of pus and infection. All the teeth were removed. The patient was very greatly improved and had a regular pulse and less frequent anginal attacks.

CASE VII (1).—A man, aged forty-one years, had had a blood pressure of over 200 millimetres systolic for a year or more; he had frightful headaches, terrible dizziness and insomnia, and had had a hemorrhage into one eye. There was no specific history. Urinalysis was constantly and persistently negative; kidney function was apparently perfect. When first seen the systolic pressure was 225 millimetres and the diastolic 130. He had five gold bridges and several crowned teeth; the gums looked clean but x ray pictures disclosed pus. All the bridges were removed, giving noxious odors, and under three of them was found terribly foul pus. The man's general condition was markedly improved, the headaches and dizziness disappeared, and he was able to do a large amount of administrative work. The systolic blood pressure, however, remained constantly from 200 to 240 millimetres, with the diastolic never below 120, after one year of observation.

CASE VIII (4).—A woman, aged thirty-six years, had had little pinpoint eruptions over her body for the last three weeks. She had a subacute inflammation in one ankle and a questionable lump in one breast. She had several bad teeth, and some pyorrhea, and x ray pictures showed tooth infection. The offending teeth were removed and the pyorrhea treated; no medicinal treatment was given. The eruption disappeared, the joint inflammation disappeared, and the lump in the breast disappeared.

CASE IX (14).—A woman, aged thirty-five years, was under treatment at sanatoriums and at home for neurasthenia, and was almost on the verge of melancholia. No single organ of the body was abnormal, but there was extensive pyorrhea alveolaris and several infected teeth. She refused to have the teeth removed. She finally landed in an asylum, although she was not insane. There she was also advised to have the teeth removed, and later they were removed. Shortly after the operation symptoms of hyperthyroidism developed, none of which were present before. For a long while the patient did not improve much, but I have not heard from her recently.

CASE X (16).—A man, aged fifty years, had an eruption on the face, around the nose, on the back, and on the chest, both purulent and semipurulent. The liver was somewhat enlarged and bile was found in the urine on repeated examinations. Systolic blood pressure, 115 millimetres. He had pyorrhea alveolaris and many bad roots and bad teeth. The diseased teeth were removed and pyorrhea treated. The liver became normal in size; the bile disappeared from the urine; eruption on the face and body disappeared; the systolic blood pressure gradually came up to 140 millimetres.

CASE XI (40).—A man, aged fifty-five years, had had a glycosuria for some time; losing weight on a rigid diet. He had no polyuria and no thirst. He had a set of false teeth on the upper jaw, but the lower jaw was in a terrible condition with pyorrhea. The teeth were fairly rotten; gums were swollen; some of the roots were fairly dripping with pus. Culture showed the usual pus germs. The teeth were removed and mouth was cleaned up. The glycosuria disappeared, and the patient was put on a diet which contained a limited amount of starch. The urine was for many weeks absolutely free from sugar.

The following is a case of great interest on account of the peculiarity of the symptoms:

CASE XII (28).—A man, aged fifty-nine years, was perfectly well up to May, 1916, when he began to be short breathed. In July he had all the serious symptoms of failing compensation of the heart, with dilatation, very low blood pressure, edema of the feet and legs, and was in bed many weeks. He improved under treatment sufficiently to be able to get up and about, but was utterly unable to do any work and could hardly walk. I saw him first in October, 1916. The pulse then was 120; systolic blood pressure, 170; diastolic, 90. He had an aortic systolic, and a slight mitral systolic murmur. He perspired very easily, and the face flushed readily; he could not walk without dyspnea. The thyroid was slightly enlarged; there was no edema. He had a serious pyorrhea alveolaris and several infected roots and many teeth were broken down to the gums. His condition was too serious to stand an ordinary operation under an anesthetic, but at his home, under strychnine and suprarenal stimulation and local anesthesia, these infected teeth were all removed and the gums treated later for the pyorrhea. Within a week after the operation a tachycardia of 140 developed, and marked exophthalmos; he was trembly, nervous, and irritable in other words, he presented a typical Graves's disease plus a damaged heart. His strength, however, rapidly improved, the heart became more regular, the mitral systolic murmur disappeared. Under treatment for hypersecretion of the thyroid the exophthalmos gradually diminished, the heart became less rapid, and his whole condition improved. From the beginning I was sure that he had thyroid disturbance, as he had symptoms that were unusual with an endocarditis or myocarditis, but something from the mouth infection was inhibiting all the symptoms of hyperthyroidism, and when that infection was removed, the usual symptoms of hypersecretion developed. This man gradually improved and became able to work, and my last record of him, in July, 1917, showed that he had been working for five months at his usual occupation, without any troublesome symptoms.

I wish to acknowledge my indebtedness to Dr. George C. Fahy for his splendid x ray pictures, his careful reading of them, and his curative dental surgery in the majority of the cases of this series.

REFERENCE.

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252 YORK STREET.

HYPERTHYROIDISM AND MENTAL DISORDERS.

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In goitre and hyperthyroidism the psychopathic phenomena are not as a rule the most prominent; the great majority of sufferers escape the asylum, although they suffer from typical mental disturbances. The clinical picture of this disease is one of toxemia with sensory perceptive, motor, nervous, and digestive disturbances.

Although we know that the symptoms are due to toxemia the result of absorption of the products of a hyperactive gland we do not yet know the stimulus which causes the perverted glandular activity. It may originate in the intestinal tract from substances taken into it or from a breaking down or synthesis of organic or inorganic substances; it may result from substances produced by conflict between pathogenic organisms or other external irritants and the body cells and fluids; or it may be due to lesions of the central nervous system and the sympathetic. But we do know that, whatever the stimulus, changes in the thyroid function and particularly hyperthyroidism present as criteria of the resulting toxemia certain symptoms or groups of

symptoms which constitute a very definite clinical picture.

These symptoms are associated by the common factor of histological change in the thyroid gland, or in portions of the gland. Whether we regard these reactions as forerunners or as stages of goitres we must be impressed with the very close resemblance of most of them to the symptoms of intoxication and of exhaustion. Prominent among these symptoms are: 1, a cardiac erethism with exceptional heart activity, irregular or rapid beat, sometimes even with dilatation and hypotension of the arteries and perhaps dyspnea on exertion; 2, general muscular weakness, occasionally with a sudden giving way of the arms or legs; 3, profuse sweating about the head, face, or body; 4, dyspepsia, which may be constant and distressing; epigastric and abdominal pain after eating or coming on during the night; occasionally nausea and unexplained vomiting; diarrhea, but oftener constipation; 5, rapid emaciation or loss of weight; 6, mild bilateral tremor of the spread fingers; 7, tumor, or enlargement of the gland, perhaps with thrill; 8, exophthalmos, with widening of the palpebral fissure, lagging of the lids, or lack of convergence of the two eyes. With these there are also, 9, headache and sometimes migraine; 10, insomnia; 11, "nervousness and anxiety"—apprehension—with irritability or apathy, excitement, restlessness, loss of memory, indecisions of the will, doubts and fears of an obsessive nature, and preoccupations which may concern themselves with any subject. Tachycardia is usually held to be the early, leading, and important symptom; but equal in importance is extreme nervousness without other demonstrable exciting cause. So important are these two indications that it is now generally held that in all cases presenting the symptoms of tachycardia and extreme nervousness the possibility of hyperthyroidism should be considered.

In this paper I shall briefly review the well demonstrated and generally recognized clinical manifestations which have to do with the central nervous system. The most exaggerated symptoms occur in the acute toxic case of exophthalmic goitre. There is elevation of temperature, extreme restlessness, tumultuous heart action, nausea and vomiting, epigastric and abdominal pain, loss of weight and emaciation, and active delirium followed by stupor which precedes death. It looks and is like violent septic intoxication. All the bodily symptoms are here overshadowed by the mental symptoms. The clinical picture, from the mental aspect, is characterized by the syndrome "amentia," i. e., by a more or less violent confusion.

Whenever encountered, this syndrome indicates either marked destructive alteration of cerebral cortical cells or the action upon them of toxic substances. Whether the toxic substance is developed within the body or is introduced from without, it exerts an injurious influence upon the delicately constituted cortical cells and their interconnecting fibres. The associative mechanism is thus prevented from performing its work properly; delays and interruptions occur along associative tracts between areas of special sense perceptions; there result feel-

ings of strangeness and unreality, bewilderment, confusion, and oppression, together with excitement or depression, sometimes with illusions and hallucinations.

Less spectacular mental symptoms characterize milder cases of exophthalmic goitre than the rapidly fatal form first described. Attacks may be mild or severe, very closely resembling those which develop from coprostasis in adults, as well as those which so frequently result from gastrointestinal disturbance during childhood, as of night terrors after indiscretions in diet. Transitory attacks of excitement with confusion or delirium are commonly encountered at some time during the course in all cases of long duration. They here develop in the soil of exhaustion and nutritive damage suffered by cerebral cortical cells as a result of the thyroid toxin. We may compare this nutritive damage to that underlying those states of organic exhaustion resulting from pneumonia, erysipelas, typhoid fever, the puerperium, etc. As in the toxins of the infectious diseases, so here, the thyroid toxin not only endangers the vitality of the nerve elements, but may also elevate or depress their condition of excitability; the effects of such stimulation or depression may be combined in a great variety of ways.

Where the effects of overstimulation or of depression are long continued they result in morbid moods. In the toxemia which is due to hyperthyroidism and goitre we frequently encounter the moods of depression and of anxiety; these moods attract or select all the experiences of the organism which they further discolor to their own shade. That these moods are precipitated by the thyroid toxin is further proved by their course.

Many cases of hyperthyroidism are marked by suspicious attitudes, with mild delusion coming on in the form of "attacks." Sometimes ephemeral, again of longer duration of weeks or months, such symptoms are rooted in a clouding of consciousness; this clouding, though moderate, is of sufficient intensity to prevent the patient from marshaling ideas before the mind's eye so that erroneous ideas are corrected or controlled, and the need of correction of morbid ideas is an ever present one in goitre; for in the chronic state of exhaustion due to hyperthyroidism, morbid ideas associated with feelings of injury, jealousy, shame, selfblame, dread, fear, and anxiety very commonly dominate consciousness with obsessive force. Slight excess of the thyroid poison is needed in such cases to develop hallucinatory states of varying degrees of vividness and of quite as variable duration. In the mechanism of their development such symptoms differ in no wise from hallucinations produced by other poisons. The hallucinations of goitre are thus explained; for, as elsewhere in psychiatry, they arise under the influence of morbid stimulation of the cerebral centres which are concerned in the process of perception.

Tanzi writes: "Cases of exophthalmic goitre which present hysterical phenomena should be regarded as latent hysteria brought to the surface by exophthalmic goitre. It is the hyperthyroidism which evokes the syndrome. Because of the associated symptoms of exophthalmic goitre we can clearly determine that it is the thyroid toxin which

has initiated the hysteria, just as it initiates the sensitiveness, the depression, and the anxiety which are common manifestations of thyroid disease. There may have been a susceptibility to acquire hysteria, but this does not negative the fact that the hysteria has been manifested through the external determinant—the thyroid toxin."

In addition to these hysterical states we encounter cases which present the milder degrees of anxiety and selfabsorption grading all the way from obsessive doubts, fears, and preoccupations which concern themselves with any subject, on through states of irresolution, incapacity for mental work, irritability, querulousness, timidity, and indecisions of the will. From the grave and rapidly fatal cases of acute toxic exophthalmic goitre and those marked by the syndromes of melancholia or of mania, on through the milder manifestations, we have to do with psychical symptoms which exist as secondary results, as indirect echoes of the disturbance which has taken place in the thyroid function: they accordingly present resemblances and contrasts which connect them closely with each other (Tanzi).

Let us study the mechanism by which these symptoms are brought about. We know that defective metabolism resulting from the acute infectious diseases and the consequent exhaustion of all the vital functions is the external determinant of variform psychotic symptoms; so also is the disturbance of physical health resulting from interrupted sleep and the reaction of a constant and gnawing habit of worrying upon the digestive and circulatory functions. How much the more readily are such results produced when an organic poison is added to the above mentioned disturbing factors—a poison, moreover, whose influence is exerted in a way that early lessens the functional capacity of the circulatory mechanism—both heart and arteries; one which, in its further passage through the body, by way of the circulation, has abundant opportunity to exercise its injurious influence upon the nutrition and the activity of other tissues and organs, not only heart muscles and hepatic and renal epithelium, but upon cerebral cells as well.

Crile's findings, in his examination of brains of patients dead of exophthalmic goitre, are almost identical with those which result from long existent intoxication and exhaustion processes, where the circulation has been laden with noxious products which are but incompletely cast off; where, in addition, perverted glandular secretions have contributed their share to the intoxication process; and where, through the heart muscle partaking of the general asthenia, there has been further diminution in the amount of nutriment supplied to the brain. These are the underlying bodily conditions which provide the chief requisites for the psychical syndrome of "confusion," with delirious episodes. But it must be remembered that toxic substances developing external to the brain and more or less continuously exerting their influence upon the brain cortex, may engender not only the cardinal symptoms of insanity—illusion, hallucination, and delusion. They also supply the bodily conditions which underlie mental malfunctioning as exhibited in weakness of memory and attention, in narrowing of the field of consciousness, with the inevitable concomitant of obsessive

tendencies, impulsions, suspicions, excitements, and depressions. Traced to their underlying anatomical substrata we find the evidences of a work—exhaustion in hyperchromatism and chromatolysis of the cells of the cerebrum, cerebellum, medulla, and even of the spinal cord.

We know that the cell body represents the trophic centre *par excellence* of the neurone's mechanism, and that upon it the activity of the nervous process depends. We know, also, that intoxications and nutritional disturbances act first upon it and to a greater degree than any other part of the neurone.

We know also that the emotional tone of the individual depends upon the nutritive state of the cortical neurones; for when there is impairment of nerve cell nutrition from any cause, feelings of depression, incompetence, and helplessness arise, with resulting anxiety, fears, doubts, indecisions, and irritability. The irritability of these patients often leads to quarrelsome tendencies, and very generally there is an incapacity for continuous mental application, in which we have adequate explanation for the feeble performance which characterizes all their attempts at activity. All these psychical symptoms are quite in keeping with the general muscular, cardiac, secretory, and excretory weakness and incoordination which stand out so prominently on the physical side; and we cannot fail to regard them as but different aspects of a disease the cause of which is disorder of the thyroid gland and annexa, a disorder which may develop either gradually or suddenly. In either instance it may produce nutritive disturbance in the cortical centres which pave the way for that condition of "irritable weakness" of the nervous system which, whether it extends over periods of weeks, months, or years, furnishes a suitable soil for the development of a psychosis. When this is associated with a congenital weakness or instability of the nervous system the danger of mental breakdown is, of course, proportionately increased.

The thyrogenous psychoses not only illustrate the importance of the toxic factor in the pathogenesis of psychic symptoms, but they further emphasize the fact that "the brain, which is extremely sensitive to all poisons, reacts to those which are produced within the organism not less intensely than to those which are derived from the outside" (Lugaro). Furthermore, in their mechanism they present a more than superficial resemblance to those special or peculiar psychic symptoms which constitute the hall mark of the intoxication and exhaustion psychoses, where we see the results of circulating toxins as earliest expended upon the neural structure which supports the latest developed function of associative memory and consciousness.

Whether the toxin exerts its injurious influence through acting over long or short periods of time, the results are reflected in consciousness; there is a feeling of inadequacy to deal with events in the environment; out of this grows an anxious depression, with a feeling of uncertainty and impotence in the face of every circumstance. A sense of strangeness, with an inability to interpret correctly impinging impressions, whether from the bodily processes or from the outside world, commonly furnish foundations for suspicious attitudes and persecutory ideas; anxious and troubled dreams with transitory deliria

complete the resemblance; disturbing illusions and hallucinations are but a further step, and these in hyperthyroidism may present special characteristics. All these phenomena in variform shadings we find associated with disorder of the thyroid gland. Generally regarded as superimposed upon goitre, in reality they are manifestations of the disease (Tanzi).

In this paper I have dealt, largely, with the somatic origin of the mental and nervous symptoms which accompany disorders of the thyroid gland. Based as they are, upon altered nutrition of brain cells, we have resulting impairment of that great regulative action of the higher cortex on the nutrition of all the tissues and the functions of all the organs, which may undergo a steady deterioration. The mental, motor, and trophic nerve centres lose their resistive power. A vicious circle is soon established, and we have not only intoxication of cerebral cortical cells by the perverted thyroid secretion and the altered nutritive fluids, but because of the impaired circulatory activity the brain fails to receive sufficient nourishment. This explains the cerebral asthenia, which becomes manifested in irritability, insomnia, dizziness, tremor, and morbid fatigue consequent upon either motor or sensory innervation, all this rendering the patient a mental and physical wreck, incapable of effective effort of any sort. It would seem as though every function of the body were involved, thus bringing into one pathological circuit the various vegetative, organic, and mental functions, for all are involved in some degree.

Individual cases present, of course, great variability in the symptoms, both psychical and physical; but in this they do not differ from any other psychosis or bodily disease. Variability is to be noted in the severity and extent of symptoms produced by other toxemias and intoxications; and this may be explained by variation in the individual degree of resistance. Just as the individual who alcoholizes himself is not an indiscriminate entity, but presents varying degrees of vulnerability or resistance, just as the power of recuperation is an inherent capacity varying in individuals suffering from the same disease, so also the histological changes in the thyroid gland may vary widely under the functional stresses to which it may be subjected, and so also its degree of restoration to functional balance may vary with the inherent capacity for recuperation in the individual. Thus, there are, 1, enlargements of the thyroid gland which normally occur during certain physiological storms, which assail the organism, e. g., menstruation, pregnancy, and the puerperium; 2, in other cases enlargements are concomitant with gastrointestinal disturbances, infections, etc., or, 3, they may be coincident with or consecutive to psychic shock from sudden fright or from long drawn out indulgences in the painful emotional complexes of shame, rage, feeling of injury, grief, or anxiety.

Where we find a preponderance of the mental over the physical symptoms—and this is not rare clinically—it may be explained by a relative vulnerability of the cerebral cortical cells. The patterns presented by the mental symptoms will, of course, vary with the experiences to which the individual has been subjected; but, in a general way, they are

marked by excitement, depression, anxiety and restlessness, weakened memory, various kinds of indecisions of the will, doubts of an obsessive nature, and preoccupations which may concern themselves with any subject. The sufferers may become irritable, and incapable of any work, and they are often irritable, diffident, quarrelsome, or timid. Excitement, with the restlessness, loquacity, and insomnia on the one hand, or the phenomena of anxiety and selfabsorption on the other, have generally been regarded as mania and melancholia superimposed upon exophthalmic goitre, but these, as also the milder psychotic symptoms, are to be regarded as having origin in the perverted activity of the thyroid gland.

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THE DAUGHTERS OF THE MOABITES AND OUR SOLDIERS.

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All means and every method known to modern medical science and art are being utilized to keep our active and potential soldiers free from venereal diseases. Instruction in prophylaxis and advice as to the necessity of retaining in the body as fighting factors the secretions of the endocrine glands and the mental value of clean living are given our soldiers in camp and cantonment. Authorities and experts from civil life are enthusiastically and freely rendering valuable services in placing facts, physiological and venereal, in such lights that only the vicious and uncontrollable will have to be governed by punitive means.

A few days ago General Pershing warned his troops in France to be very careful of the wiles of pretty women and desirous girls. He told them that attractive and coy young women were a danger to all soldiers and a menace to the army. They are in and around camps generally for one specific purpose—to wean military secrets by caresses and sensual traps. This warning to soldiers is so old—Oh, so old! Unheeded it has meant the overthrow of many armies. No matter what armor Mars may wear Venus can always find a vulnerable spot. A greater general than Pershing warned his troops against the wiles of women. The warning went unheeded until the effects upon his soldiers were so devastating that Moses took drastic means to stop any further depletion of his army. "Moses said unto the Judges of Israel, slay ye every one his men that have joined themselves unto Baal Peor" (lord of the penis). The reason for this drastic order is obvious. His troops were weakened and dying through the plague, syphilis. The number affected or thought to be in danger of infection is given by St. Paul. "Neither let us commit fornication, as some of them committed, and fell in one day three and twenty thousand." (I Corinthians 10:8).

The problem of control of venereal diseases among armies is so old as to antedate any veracious history, data or sources. We have numerous references to the subject in ancient writings and his-

torical works which show it was the dominant factor troubling all commanders of troops. The ancient peoples, up to the period when a false idea of the sin in possessing sex knowledge and all scientific knowledge was forced upon man—the early Christian era—did far better in handling the venereal menace than has ever been done up to the present war. They recognized the frailty or strength of man—take your choice—and his inherent sexual impulses. Every effort was made to prevent disease. Their priests and officers did not preach nor demand continence or fatuously attempt to believe that masses of young and virile men could have fighting qualifications and at the same time be free of sexuality.

Sexuality and pugnacity are interchangeable terms. I pointed this out in a former article (1). A man devoid of sexual impulses is a weakling. A sexless soldier is a paradox. To state that a man can be a good fighter yet free from impelling sexual desires is pure bathos. Those who would preach the necessity of driving out all sexual impulses in our soldiers are merely demonstrating a state of amphigouri. The greater the maleness the greater the warrior. To shunt and control the stimulating and power producing elements of the sex glands into physical prowess and mental alertness is the one great problem for individual and army.

I assume it will be of interest to read a somewhat cursory account of how Moses and his officers attempted to solve the problem and save their troops. But first let us see just what Moses was up against. He recognized that his real one dangerous enemy was venereal disease and the consequent physical weaknesses through sexual excesses. He realized that his foe was sending beautiful girls and young women to his camps. No arms are so dangerous in war as the arms of women. Venus Vulgiva slays more warriors than Mars when mad. Venus Urania remains curtained in the home, but her destroying sister, Vulgiva, ever follows the camps and cantonments. It may be, and it is probable from evidence at hand, that the enemy has sent ahead women fully loaded with those germs, gonococci and spirochetes. To those who think such a method of destroying our soldiers is a product of a fertile imagination, I have only to call their attention to statements made in a remarkable book just published in Germany (2). In it the author says: "I was asked recently by one of our ablest military men whether it were possible to drop bombs containing cholera germs or plague bacilli behind the enemy's front. . . . A general staff doctor said to me at Graudenz that he had often wondered whether we could not somehow manage to slip into Russia, in order to inoculate Russians there with living bacteria."

But let us go back to Moses's army. When the Jewish army arrived at the river Jordan the people of that region became terrified. They realized that Moses's army had been victorious and they would fall into its hands. Balak was king of the Moabites and in terror of the approach of Moses's army. So he sent for the soothsayer Balaam, believing that this charlatan's art as a fear maker would drive off the approaching foe. Now, according to biblical lore, Balaam became inspired by the Lord and

blessed the sons of Israel. But somehow the source of inspiration seems to have been misunderstood or else we misunderstand God. Perhaps the men of the day did not give the Prince of Darkness proper credit, or more likely Balaam was a born charlatan. And if one fully comprehends the power and laws of heredity this is the best way out, for Balaam left many descendants including his prize ass.

Balaam doublecrossed the sons of Israel after blessing them. After this blessing he went to Balak and told this credulous king how he could destroy the power of Moses's army. Whoever inspired him to give such advice is now a small matter; the fact that he told the king the everlasting truth about women is very important. Both Josephus and Philo give us vivid accounts of just what Balaam said to the king. Philo is more exact in detail and more in accord with what we know of the law of Moses as laid down for the control of venereal diseases. The translation I use is that of Dr. Julius Rosenbaum:

All my words, said he [Balaam] thus far are dark sayings and prophecies; what I shall speak henceforth will be the counsels of my own mind. But come, let us look into his excellent advice, in what artful ways it has been framed for the sure and certain destruction of our ever victorious foes. For perceiving that the Hebrews could be overcome in one fashion only, viz., through their violating the laws by some terrible wrongdoing, he set himself, employing the bait of lust, to lead them on by way of fornication and incontinence, great offenses in themselves. "For the land," said he, "O King, far excels all others in the beauty of its women; and by no other things may men's minds be so readily mastered as by women's fairness. So if thou suffer the fairest among them to play the harlot and offer their beauty for a price, they will catch the young men of our enemies, so to speak, on the hook. They must be instructed not to surrender the enjoyment of their persons straightway at the first offer. For the sharp sting of a feigned refusal will, as thou knowest, excite their longings more keenly than ever, and inflame their passion, till driven on by lustfulness they are dragged along, as it were, by a halter round their necks, and there is nothing they will consent not to suffer."

Now such was the advice Balaam then offered; and the King deeming that he spoke much to the purpose, repealed the law as to unlawful intercourse, and removed all punishments, for fornication and licentious conduct, and made them as though they had never been, giving free license to the women to lie with any man they pleased. And the latter, permission being granted and impunity guaranteed, soon ensnared a great number of the young Jewish warriors, whose minds indeed had long beforehand been entangled and by every trick and allurements impelled toward impiety.

The drastic laws Moses immediately laid down, the killing of "three and twenty thousand" of his soldiers, the cleansing and washing, the quarantines, the prophylactic methods and death punishments for any soldier accepting the favors of the women of the enemy, are all too well known to the informed man to repeat here. However, one hygienic fact we must not overlook: Moses permitted—demanded in fact—that his soldiers take to themselves as wives all the young virgins left in the immediate land. Unfortunately he does not—neither do Philo nor Josephus—tell us just how many virgins, or presumably women free from venereal disease, were obtained. And as the ancients were very adept at remaking even a worn out harlot to pass as a virgin to the average man, Moses did not entirely prevent the progress of venereal diseases.

Let our young men have a working knowledge of the hygiene of sex and all its truth plainly put

before them. Then when they have done their duty to their country they may frankly face without fear this question:

"Ye have read, ye have heard, ye have thought," he said, "And the tale is yet to run;
By the worth of the body that once ye had,
Give answer, what have ye done?"

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MOSSFELL.

THE SURGICAL ASPECTS OF GASTRIC HEMORRHAGE.*

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Gastric hemorrhage may manifest itself by hematemesis, coffee ground vomitus, or tarry stools or even, where the leakage is slight, by little more than occult blood in the stools. It is fatal in three to eleven per cent. of cases. The bleeding may be arterial, venous, or capillary. Gastric hemorrhage may occur as a sudden profuse hemorrhage with hematemesis and melena. Such hemorrhages as a rule are not repeated, though they may be. They are frequently not preceded by the symptoms of chronic ulcer and are often spoken of as due to acute ulcer. In some cases severe hematemesis is the first or a very early symptom of a chronic ulcer, especially a duodenal ulcer, which is latent. Though profuse gastric hemorrhage occurs in quite a few patients with chronic gastric or duodenal ulcer, most of them present previous symptoms indicating the diagnosis of ulcer.

In other cases no ulcer is present, but perhaps merely mucous erosions, most often multiple. This form of gastric hemorrhage also occurs in toxic conditions due to an extragastric cause. These profuse hemorrhages are fatal occasionally, but not as a rule.

CASE I.—In a patient transferred to my service in Bellevue Hospital from the Medical Division, about three years ago, with the diagnosis of chronic ulcer, a sudden profuse hemorrhage caused death within an hour, the day before he was to have been operated on.

CASE II.—In another patient, with symptoms dating back two years, who was transferred from the medical to the surgical division last March, a sudden severe gastric hemorrhage occurred in the evening. She vomited eighteen ounces of bright red blood and showed marked signs of hemorrhage. The following morning transfusion of 500 c.c. from her sister was commenced by the citrate method, but after 100 c.c. had been introduced she became cyanosed and dyspneic, vomited a quantity of dark blood, went into collapse, and died in ten minutes.

These examples of death from acute gastric hemorrhage are fortunately not common and are the only recent cases in my experience. A more common form of gastric hemorrhage from a chronic gastric or duodenal ulcer is where a considerable, but not profuse, hemorrhage occurs, usually causing both hematemesis and melena. After an interval of a few hours to several days this may be repeated once or a number of times. The first hemorrhage does not cause alarming symptoms, but if it is repeated the patient rapidly becomes anemic. Prompt

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treatment is required after a second hemorrhage or the result may be fatal.

CASE III.—In one case to which I was called out of town a year ago a number of such hemorrhages had occurred until the hemoglobin was so low that it could not be accurately estimated, and the patient showed signs of profound anemia. He had given symptoms of chronic ulcer for a number of years. Gastroenterostomy, with exclusion of the pylorus end of the stomach, was done under local anesthesia. An infusion was given, as transfusion could not be arranged for at once, but he died about twelve hours later.

A common form of gastric hemorrhage consists in repeated small hemorrhages, sometimes with slight hematemesis, more often with only a moderate or even a very slight melena. These patients often slowly become anemic, though the loss of blood is partly made up and, in the intervals between the periods of bleeding, may be completely made up. The hemorrhage in gastric carcinoma is usually of this type, but as it is more continuous the patients become very anemic. In the cases I have resected, where the hemoglobin percentage is noted in the history, it averaged forty-two per cent. yet these patients all recovered from the resection remarkably well.

To say that the source of the hemorrhage is from the stomach or duodenum is of little value in making a diagnosis or determining the proper treatment. Of course we must be careful to exclude cases where blood has been swallowed and then vomited. Slight lesions or operations in the mouth, nose, throat, etc., may, as we well know, give rise to apparent gastric hemorrhage. In some pulmonary lesions, when the blood is mostly swallowed and then vomited, it may require a thorough examination to determine whether it comes from the stomach or the lungs.

More important than the source of the hemorrhage is the cause. This may be 1, intrinsic, due to a lesion in the stomach or duodenum, and, 2, extrinsic, where the cause is extragastric. The intrinsic or gastric lesions causing gastric hemorrhage are chiefly ulcers, acute or chronic, more rarely syphilitic or tuberculous, and carcinoma. The mucous erosions might be considered intrinsic lesions, but they are usually due to some extragastric toxic or infectious cause, though they have been reported in the presence of ulcer. Microorganisms may be obtained from the depths of some erosions and the same organisms may be found in other organs, such as the spleen (Rosenow). Hemorrhage from so called acute ulcer is the sudden profuse variety without previous gastric symptoms. These seldom recur as the absence of infiltration allows the vessels to contract and retract and arrest the hemorrhage. When these patients have been operated on no ulcer is found as a rule. If the stomach is opened multiple erosions, each oozing blood, are often encountered; sometimes no lesion is discovered. In chronic ulcer we can understand the source and cause of the bleeding. A vessel becomes eroded on one side and cannot retract as a divided vessel does and in addition it is held open by the surrounding induration, rendering more difficult the stoppage of bleeding by clotting. The vessel eroded may be one of the larger arteries or veins. According to Brinton the splenic artery is responsible for fifty-five per

cent. of deaths from fatal hematemesis. The coronary and the pancreaticoduodenal arteries are about equally responsible for fatal results. Venous hemorrhage is less fatal as the venous pressure is so much less. Even in fatal hemorrhage, however, in the presence of chronic ulcer, no gross vascular lesion may be discoverable. Such hemorrhage is sometimes spoken of as capillary and it may be so free as to be indistinguishable from that coming from a large vessel.

In a few cases the bleeding comes from a small ruptured aneurysm in the wall of the stomach. In addition to surgical gastric lesions, especially ulcer, hemorrhage from the stomach may be due to a great variety of extrinsic conditions, often of a medical or nonsurgical character. Certain extragastric conditions, however, must be mentioned, as the treatment of the hemorrhage is surgical and directed to its cause, and the diagnosis of the condition, if made, may avoid an unnecessary gastric operation. The chief of these are: 1, portal cirrhosis of the liver and splenic anemia, and 2, infections of the gallbladder and appendix. In cirrhosis the veins of the stomach may be enormously dilated or varicose and the giving way of one may cause a large hemorrhage, not often fatal, as the pressure in the veins is low and becomes lower from the loss of blood. Balfour (1) has recently called attention to splenic anemia as a cause of gastric hemorrhage and the curative effect of splenectomy, illustrated by an interesting case in which the symptoms suggested duodenal ulcer. The treatment of these cases is surgical. In splenic anemia the spleen is moderately enlarged and often very adherent. Furthermore, as hepatic cirrhosis may be secondary to splenic disorder or to toxins originating in or elaborated by the spleen, splenectomy may cure the cirrhosis or prevent hemorrhages due to it. The spleen may also act as the medium through which infection from a distant abdominal focus may be transmitted to the liver, causing cirrhosis, or the bacteria may be transmitted directly to the stomach, causing erosions if not ulcer. In either case the causative rôle of the spleen is important. The differential diagnosis of these extrinsic causes is often a difficult problem and the difficulty is increased by the fact that such conditions as cirrhosis, gallbladder disease, appendicitis, etc., are often associated with gastric disturbances simulating those of ulcer, so that when hematemesis is added, unnecessary and unsuccessful operations on the stomach are not infrequently undertaken. According to Eusterman (2) about two per cent. of cases of appendicitis and five per cent. of gallbladder infections, with marked reflex gastric symptoms, give a history of gastric hemorrhage.

Gastric hemorrhage in the course of acute infections, such as typhoid and pneumonia, do not concern us surgically. There are many other medical conditions which sometimes give rise to gastric hemorrhage. Another form of gastric hemorrhage is that which occasionally follows operations on the stomach, such as gastroenterostomy. This usually occurs on the first day or two after operation and is usually moderate in amount and seldom so serious as to require reoperation. Downes has reported

one case of serious hemorrhage from the margin of a gastroenterostomy, cured by opening the stomach and an extra suture of the posterior side of the stoma, whence the hemorrhage came.

CASE IV.—In a case of my own (M. C.) where I had done gastroenterostomy for ulcer recurring five months before, after the closure of a perforating ulcer, seventeen months before, in another hospital, a considerable hemorrhage occurred on the fourth day and again on the seventh day after operation. After transfusion on account of the patient's exsanguinated condition, the stomach was opened nine days after the first operation. The gastroenterostomy was found smoothly healed and not bleeding, the hemorrhage coming from the ulcer. After a slight hemorrhage the following day he made a good recovery.

I have seen no hemorrhage from the site of the operation that did not stop spontaneously.

Postoperative hematemesis may also occur after operations, usually on the abdomen, but occasionally in other regions. It has been explained as due to general anesthesia, sepsis, injury to the omentum, etc., but none of these explanations apply in all cases. There is no gross lesion of the stomach and operation has not proved successful and is not indicated. The condition has resulted fatally in over half the cases. As will already be evident the diagnosis of the cause of gastric hemorrhage is not easy and Preble estimates that in two thirds of the cases it cannot be made. This has an important bearing on the treatment. The x ray may greatly aid the diagnosis, but many hesitate to apply it in the presence of severe gastric hemorrhage. Incidentally we also see that gastric hemorrhage, *per se*, is of very little value in the diagnosis of ulcers.

The question of whether and when to operate in the grave crisis of gastric hemorrhage is often a trying one for the surgeon. In the first class of cases, those of sudden profuse hemorrhage, operation during the hemorrhage is unwise. This is abundantly proved by statistics, which show that medical treatment is far safer. The mortality in the latter is three to seven per cent. against thirty-six to sixty-two per cent. after operation, according to various statistics. Dieulafoy is almost alone in advocating operation during the first hemorrhage if more than a pint of blood is lost. The very fact that medical treatment is so often successful shows that capillary oozing or bleeding from small vessels is the most common form of such gastric hemorrhage. The hemorrhage itself tends to produce conditions of blood pressure and diminished heart action which help to arrest the bleeding, but are unfavorable to operation. This arrest of hemorrhage is encouraged if we establish perfect rest in bed, aided by morphine and the giving of nothing by mouth. An ice bag on the epigastrium and hot water by rectum complete the essentials of treatment. Hypodermoclysis may be substituted for enemata and, if the situation is desperate, transfusion may be life saving, as it not only supplies the necessary fluids but increases the coagulating power of the blood. Transfusion, however, is more effective after repeated hemorrhages. In the cases of so called acute ulcer, operation generally discloses a condition of multiple erosions or a general oozing and is usually ineffective.

If, however, the history of the case justifies the diagnosis of chronic ulcer, operate when the cir-

culatory conditions have returned to normal, without waiting for further hemorrhage, for the bleeding is very likely to recur after septic disintegration, reinforced by the digestion of the clot. After a second hemorrhage operation is imperative if the patient's condition permits.

In the case of less profuse but repeated bleeding due to suspected ulcer, do not delay operation after the second hemorrhage. If the patient shows severe anemia, transfuse and operate at once. In cases of still less severe bleeding from chronic ulcer, operate if the anemia approaches a dangerous degree and in any case if, after careful medical treatment, bleeding again recurs. Every case of gastric hemorrhage occurring or recurring after a thorough ulcer cure demands operation.

The choice of operation is often a problem. We may do gastroenterostomy alone or with pyloric exclusion, with an excision with the knife or cautery or, finally, with resection. Paterson (3) argues in favor of gastroenterostomy alone as the simplest and safest method of operative treatment and one that arrests the hemorrhage in the great majority of cases. I believe that when the operation discloses no chronic ulcer, gastroenterostomy is preferable to opening the stomach, searching for the bleeding point or points and ligating the mucosa *en masse* or applying the cautery. Gastroenterostomy, however, has failed in a number of cases to check the hemorrhage. Von Eiselsberg (4) reports the death of seven patients from hemorrhage after 334 gastroenterostomies. Balfour (5) states that "to depend on gastroenterostomy alone is to court recurrence of the hemorrhage." Von Eiselsberg adds that in some cases not only did the gastroenterostomy "not stop the hemorrhage, but apparently induced it." Others have had a similar experience and I have had one such case, referred to above.

It would seem that the addition of exclusion of the ulcer area, especially in pyloric and duodenal ulcers, would render the cure by gastroenterostomy more certain; but von Eiselsberg reports one case of continued bleeding after his effectual method of exclusion. Although gastroenterostomy, with a simple method of exclusion, is almost as safe as gastroenterostomy alone and will cure almost all, but not all, cases of gastric hemorrhage, I have had two cases in which I believe that the exclusion started hemorrhage from an ulcer that had not been bleeding. In one case of gastric hemorrhage I did a gastroenterostomy and tied the vessels in the vicinity of and leading to the ulcer, with a satisfactory result. This procedure might well be practised more often. In these cases we not only wish to stop the hemorrhage but to save the patient, who, on account of the loss of blood, is not as good an operative risk as a simple ulcer case. Our primary aim is to check the hemorrhage, secondarily we wish to cure the ulcer if possible.

What more can we do to check the hemorrhage more effectually? Two operations suggest themselves, which would appear to be radical, excision and resection including mesogastric resection. These are indicated in chronic gastric ulcers, whereas in bleeding duodenal ulcers, gastroen-

terostomy with pyloric exclusion and ligation of the vessels is the preferable method. If the cautery method of Balfour is applicable it is the simplest, otherwise the V shaped incision is employed. In either case gastroenterostomy should be added if possible, or it will be required later, and the immediate result is also better. If resection is not too difficult, on account of adhesions, it should give perfect results. The Polya-Reichel technic is to be advocated as it saves time. I must again warn against the temptation to do too much in patients weakened by hemorrhage, even when transfusion has improved the operative risk. In one such case, after transfusion had brought the patient from a critical to a fairly good condition, I attempted a von Eiselsberg exclusion but, owing to the induration and adhesions of the distal segment, I was unable to close it satisfactorily and had to resect. The patient lived a week and then died, with no symptoms except increasing weakness. Another transfusion might have saved him but this could not be arranged for in time. I would therefore warn against doing the more radical and severe operations unless the conditions are favorable for a rapid operation and the patient is not too depleted.

Suppose, after recurring hemorrhage and perhaps symptoms suggesting ulcer, that we operate and find no ulcer present, what are we to do? What has been said concerning the cause of the hemorrhage suggests several possible procedures. If there is an infective focus in the appendix or gallbladder it should be removed. Appendectomy has been followed by the arrest of the hemorrhage in several cases. Then we should examine the liver for cirrhosis and the spleen for enlargement. The early stages of cirrhosis may show little or no appreciable gross lesion and if it did there is little we can do surgically, unless we can remove the cause. Mayo(6) and Balfour have called attention to the close relations of the spleen and liver anatomically and pathologically, and to the fact that the condition of the spleen may be responsible for the cirrhosis. Its removal may arrest or cure the cirrhosis. Splenic anemia is often associated with repeated gastric hemorrhages. Hence if the spleen is found enlarged, with or without evident signs of cirrhosis, its removal may cure the gastric hemorrhage, as in Balfour's case referred to above.

Finally the life saving value of transfusion is often most striking. It makes up the loss of blood, favors the arrest of hemorrhage by increasing the coagulability of the blood, and renders the exsanguinated patient an operable risk. I have seen it alone arrest gastric hemorrhage.

RÉSUMÉ.

The cause of gastric hemorrhage may be in the stomach or outside. Hemorrhage from gastric ulcer is not so frequent as often supposed and hemorrhage, *per se*, is of little value in the diagnosis of ulcer. The correct diagnosis of the cause of the hemorrhage is made in less than half the cases.

The cases of gastric hemorrhage curable by surgical operation are those due to chronic ulcer and carcinoma and to diseased conditions of the appendix, gallbladder, and spleen.

Do not operate during profuse hemorrhage. Treat such cases medically and operate when the patient has sufficiently recovered, if chronic ulcer is suspected. In case of repeated hemorrhages operate before the patient becomes profoundly anemic.

Transfusion may be life saving, may check hemorrhage alone, or make the patient an operable risk.

Gastroenterostomy is the simplest and safest operation, but alone or even with pyloric exclusion is not an absolutely certain cure. Add excision or resection if the conditions are favorable. Avoid the temptation to do too much.

Save the patient as well as check the hemorrhage.

If there is no ulcer explore the appendix, gallbladder, and spleen, with a view to removal if pathological.

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117 WEST THIRTY-SIXTH STREET.

ON THE NATURE OF THE TRANSFERENCE IN PSYCHANALYSIS.*

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In the early stages of the study of psychoanalytical treatment, the main stress was laid on obtaining the patient's associations to those experiences of his past life the memories of which he had forgotten, because of the existing unpleasant nature of the emotional content of these complexes. The analyst at that time bent his efforts toward getting the patient to recall these forgotten experiences. The early cathartic method of Breuer and Freud depended for its success on enabling the patient to give full vent to his thoughts, releasing in this way pent up emotion, and at the same time once more forming associations between long forgotten or repressed incidents and the emotions separated from them. At that time, the physician attempted to get at the unconscious of the patient by constantly urging him to tell what came to his mind during the session, as if the all important thing were to get at the repressed or forgotten memories.

While today we still insist on the patient telling all thoughts that occur to him in the course of a session so as to ascertain his repressed emotions, we also lay great stress not only on ascertaining his early life, but in addition his present attitude to his environment, for this is determined by his previous experiences, as indeed it is, for all of us. One characteristic present, however, to a greater extent in the neurotic than in the normal is the tendency of the former unconsciously to live in the past, or as Freud puts it "on reminiscences." The neurotic in his emotional life is essentially of an infantile or undeveloped type, making it very difficult for him to bring about a satisfactory adjustment to the environment in which he finds himself. The emotions of love, hate, envy, jealousy, etc., of the neu-

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rotic are present in degrees greater than in the normal. More important still, they are evoked in the former by apparently trivial incidents. Unless we get at the unconscious source of these excessive emotions we cannot logically explain cause and effect. Yet in reality cause and effect are proportionate, if one can but establish the proper cause.

The realization by Freud and his coworkers of this aspect of the neurotic formed the basis of the progress of the psychoanalytical treatment, for now the individual as a whole, his entire emotional life, came to be treated. The symptoms were now important only in that they showed the presence of a disturbed emotional equilibrium. This led to a recognition of the fact that the patient was still reacting to his environment in an infantile way emotionally. It was noticed that in some patients, in spite of the unfolding of the patient's past life, in spite of the fact that he recalled many memories of forgotten experiences, still no permanent cure of the symptoms resulted. At times without the production of any or of very few memories of repressed experiences a disappearance of the symptoms resulted. Again it was noticed that at times no recollections of past experiences were produced, in spite of the fact that it was evident that the patient had gone through some; or often dreams of the patient brought no associations with them even though a superficial interpretation would have disclosed vast quantities of repressed material. Still other patients manifested reactions of anger, suspicion, spite, love, envy, etc., directed toward the analyst without sufficient conscious cause. All these factors, not in themselves symptoms for which the patient came for treatment, yet on account of the infantile neurotic constitution of the patient, necessitated clearing up before we could proceed with the treatment.

These factors go to make up the transference, which we may define as a carrying over to the person of the physician, emotions of varying kinds and intensity. The bringing to the consciousness of the patient the full import of these emotions and connecting them with their real source are the most important tasks of the analyst. Since the attitude of a neurotic toward his environment is essentially, even though unconsciously, infantile, he makes no exception in the case of the analyst. As we shall see, the physician in fact represents unconsciously to the patient a reproduction of individuals that have meant much to the patient in his early life. The patient, in the course of an analysis, lives through his early, forgotten experiences, and vents on the physician all the repressed feelings with which he invested these early personages and experiences. The patient does all this unconsciously. The analysis serves at first as a liberating agent of these repressed emotions, then fixes them on the analyst, and finally enables the patient once more to associate his repressed experiences with their proper emotions, giving these "free floating" emotions, or as I have mentioned above, these excessive emotions, their proper attachments. By "free floating" emotion we mean one which on account of the now unpleasant or unbearable nature of an experience once pleasant, has been detached from that experience, causing a purposeful, though unconsciously produced forgetting. This emotion having no fixa-

tion attaches itself to any incident or object at hand. That explains to some extent why many neurotics are of such rapidly changeable moods and interests; these emotions not finding their original or fully equivalent complement, so to speak, constantly are rapidly detached from the substitute and seek another one. In the analysis the physician serves as the object to which the patient attempts to fix his emotions or interests, and as mentioned before it is the important task of the analyst first to recognize the various manifestations of this interest (transference) and then to enable the patient to manage them himself by making them conscious. I shall later give examples of the transference, by means of which I hope to make more clear its mechanism and its extreme importance for the cure of the patient. For we feel that unless the transference is properly managed, and its various manifestations made clear to the patient, we should not speak of cure; because cure does not, from the viewpoint of the analyst, consist merely in the removal of the symptoms. This was the defect in the cathartic method of Breur and Freud; the symptom was the main concern of the physician, and toward it he directed all his energy. The treatment did not take into consideration the patient's attitude toward the analyst, this attitude at the same time, being symbolic of that toward his environment in general.

What is the nature of the transference? How does it manifest itself? For a moment, before answering these questions, let me ask you to form a mental picture of the type of individual prone to the neuroses. He or she possesses some or all of the following characteristics to an abnormal extent. The individual is distrustful, suspicious, shy, or bashful; he may be one easily excited to enthusiasm, with a tendency to manifest intense disappointment if things do not turn out well, or again such an individual may be sexually hyperesthetic. He or she, so to speak, falls in love very easily; the sexual demands are constant, but are of necessity or for moral reasons suppressed. Again the individual may be one who shirks his responsibilities, seeking always the easiest, which often is not the manliest, way out. Or again an individual may manifest on the slightest provocation hate, envy, jealousy, etc. In this list are individuals with emotions that are present in all of us, both normal and neurotic. However, if they are displayed only in quantity adequate to the occasion, we say a normal reaction has taken place. With the neurotic, however, it is not so much the nature of the situation that calls forth a reaction as it is his emotional constitution which causes him to "feel" with an intensity out of proportion with that apparently warranted by the occasion. So that when such individuals develop nervous diseases, we have the entire individual to look after, and since the symptoms are dependent on some of these emotional conditions, and since the patient takes the analyst into his environment, and manifests an attitude toward him determined by these emotions, it is of prime importance to analyze them and thus enable the patient to assume a more normal attitude toward his environment.

Apparently digressing once again, let us for a moment consider a neurotic under nonpsychoanalytical treatment. We know how often the patient does

well at first, that he sings the praises of the doctor or treatment or both. In such instances the patients "like" the physician and many neurotic women, who talk emotionally, if I may use the expression, say they "love" the doctor, without realizing the full significance of what they say. However, as soon as these patients feel that the physician is not in sympathy with them, or if perhaps the physician is on occasion less cordial than usual, the symptoms again annoy the patient, he changes physicians, at the same time criticizing or censuring his previous physician or treatment. We all know for how much the human element counts in the practice of medicine as to the success or failure of a remedy. Sympathy on the part of the physician for a patient or on the latter's part, belief or faith in a remedy is a great factor in the cure of neurotic ailments. The lack of these positive qualities usually means failure. The same feelings exist for the physician when the patient is under the care of an analyst. The difference between the two forms of treatment is that the origin of these emotions is ascertained in the analytical method and not in the other forms.

To illustrate the nature of the transference, I shall cite instances of its occurrence during the course of a psychoanalytical treatment:

CASE I.—A patient, a man, thirty-two years of age, came to me suffering from psychic impotence, in whom at the time the predominant emotions were, and had been for many years, distrust, suspicion, envy, and hate. Opposed, so to speak, to these emotions was a blind faith in and obedience to those whom he liked or respected, this, however, changing on even the slightest provocation to open hostility and hatred. This patient manifested toward me the same emotions, hate being the most prominent. On one occasion, at a time when he was very resistant to the treatment, I was urging him to tell me his thoughts in connection with a dream he narrated. The patient, with a frown, sat in silence, watching my hands. Suddenly his face showed intense anger, and on being urged to speak, said that my hands reminded him of those of his father, who had often struck the patient without much provocation. He added that our sessions, especially my urging him to speak when he did not wish to, recalled frequent occasions when his father taught him arithmetic, in which he was very backward; that he frequently refused to answer, merely to make his father angry; also that the sessions were very painful, in that he found it so difficult to grasp things. (The patient frequently complained of being unable to understand what I said.) He further added that during those sessions, as now, his thoughts were often far away from the subject matter, for which he was then punished. Still looking at my hands, he said that they made him recall the thoughts he had then entertained of his father's hands, namely, that his father must often have handled the genitals of the patient's mother, and that the father's fingers smelled from the contact, making the patient draw away from the father. (The patient as a very small boy had frequently handled the genitals of his little female playmates.) When he reached this period in his narrative, the patient stopped giving his associations, though it was evident he had not finished. Upon my request that he proceed, he became even more angry and said, "Your telling me to 'go ahead, go ahead' recalls to me an incident when I was fourteen years of age. I slept in a room next to that of my parents and I heard my father urging my mother, at least that is how it appeared to me then, to allow him to indulge in intercourse. That made me furious at my father and I hoped my mother would refuse him."

From the above narrative it is evident, that while I evoked the feelings described, in reality I was but a substitute, in whom a very superficial likeness served as a means of identification with the patient's intensely hated father.

CASE II.—As an illustration of what now is suspicion, but what years ago in his early childhood was merely normal curiosity, I cite another patient who now and then, apparently apropos of nothing, asked me questions concerning anatomy and medicine. Thinking the questions were put in good faith, I answered them in the same spirit. However, the patient repeated the same questions, with a tone in his voice indicative of ulterior motives. If he noticed any difference, ever so slight, in the answers to the same question, a faint smile crossed his face, as much as to say, "I've got you now," and he remarked that on the previous occasion I had answered the questions differently. Realizing this, when the question was next repeated instead of answering it, I asked the patient to tell me what came to his mind. He said that as a child, he had often asked his parents questions on sexual matters, and had been given an evasive answer or told to keep quiet; that often to the same question he had received different answers; that he had learned from people other than his parents the true nature of sexual things, and had suspected his parents of lying to him. He also recalled in this connection that he had often looked up in the dictionary any word he had heard his parents use in a significant way or a word on which he thought they had laid a peculiar emphasis. He thought these words had a secret (sexual) meaning and that the parents had used these substitute words for the original ones, just to prevent him from understanding the references. The patient in this connection informed me that he had read things in a medical journal and had put questions to me to find out if what I said tallied with what he had read. If I did not agree with what he had read I was in the wrong, and he felt that I was not a good physician and did not understand his case well.

In this instance, too, we see that the attitude toward the analyst, unwarranted suspicion and distrust, was traced to infantile sources.

CASE III.—Another patient gave evidences of delay in progress of the treatment by long silences to stimulus words or to parts of his dreams given to him with which to produce associations. Asked to associate the mood in which he felt himself to be during these silences, and to give his thoughts, the patient said that as a child he was stubborn toward his parents; that when found to be in the wrong and urged to confess, he kept perfectly quiet, just for spite; also that to punish his parents and to spite them he would not talk to them for several days at a time and that he was very surly on these occasions.

CASE IV.—Another patient, nineteen years of age, took undue pride in the fact that his father was a college graduate, while the fathers of his playmates possessed no learning. The boy felt that this increased his prestige among his playmates. This same young man, however, manifested disrespect and disdain for his father, because the latter was of Hungarian birth, the patient having heard a very disparaging opinion of Hungarians expressed by a friend whom the patient greatly respected on account of his wealth. Progress in this patient was retarded until it became evident to him that he identified me with his father on the superficial resemblance in that both his father and I are of Hungarian birth and graduates of the same college.

The criticism has been leveled at psychoanalysis that it is a dangerous procedure because by delving into sexual topics, especially with female patients, sexual desires may be aroused in the patient. How baseless this is may be shown by calling to your attention phenomena which must have been noticed by every practitioner while making a physical examination on a female patient. The blushings, confusion, undue modesty, the turning away of the head, the attempts at covering the exposed parts, etc., all indicate on the part of the patient an unconscious defense reaction to what she unconsciously interprets as sexual advances on the part of the physician. In reality these phenomena are unconscious reactions

to her own impulses. No doubt many practitioners have noticed similar phenomena in the process of making a vaginal examination. Some years ago I questioned a number of women who, when undergoing a vaginal examination, were not perfectly quiet and relaxed. A number of these women frankly stated that they experienced sexual sensations during the examination. Yet one would not, in spite of all this, say that a physical or a vaginal examination is a dangerous procedure. Essentially the patients are responsible and not the physicians. Analogous phenomena, dependent somewhat on the nature of the subject under discussion at the moment, present themselves during a psychanalysis. However, psychanalysis does not create these phenomena, but just as in the instances above cited, is the occasion for their appearance. In all nonpsychanalytic treatment of neurotics, similar phenomena are evidenced.

From a psychanalytic point of view, roughly speaking, we divide the patients manifesting the above phenomena into two classes. In the class showing the unconscious defense reactions of undue modesty, bashfulness, etc., we put women to whom sex consciously is repellent, unclean, and disgusting. Such women as a rule are frigid during the sexual act. In the other class belong the women who are hyperesthetic sexually, aroused on very slight provocation, and frequently indulging in day fancies of a markedly erotic nature. These two types constitute a large class of women who are prone to neurotic manifestations, thus, as in the case of the male patients cited in the early part of this paper, bringing with them to the psychanalyst previously determined emotional characteristics. However, these patients manifest the same attitude to their physician when treated by nonpsychanalytical methods. The psychanalyst, however, makes it his prime duty to bring to the conscious knowledge of the patient the causes of these reactions. I shall now cite several instances of the manifestations of the transference in female patients in so far as it shows more or less definite sexual characteristics.

CASE V.—A girl of twenty-one years, modest, bashful, and shy, during the course of psychanalytical treatment dreamed that she had inserted a long rubber tube into her vagina. In giving her associations with this dream, they recalled to her other dreams years ago of a frankly sexual nature. In addition, the associations led to her telling me that she had had erotic fancies concerning myself, in that when she thought of me she pictured the male genital organs. At this point the patient asked, "How is it, doctor, that I never had such thoughts before?" It seems to me the treatment puts them in my mind." I allowed both the question and the criticism of the treatment to pass for the time being without comment. I did not deem it expedient then to urge the patient to tell me what lay behind the question and the criticism. At the next session, in associating another frankly sexual dream, she informed me, with some hesitation, that she had not told the full truth on the previous day. She now said that the same fancies concerning a young man, with whom she had fallen in love, had been present a few months before she began the treatment; that even before this, while sitting in railroad cars, or on seeing men passersby, she had had the same phantasies. All this she associated with a sexual curiosity concerning the genitals of one of her brothers, whose first name is the same as mine, the name serving as a ready means of identification of her brother with me. It is of further interest to note that this patient liked her male acquaintances for the characteristics they possessed in common with this brother.

CASE VI.—Another of my female patients, both in her dreams and day phantasies, pictured me as an elderly man, who, in addition to some of my own traits, possessed some in common with her husband, who was much older than the patient, and also in common with her father. In the course of her married life, this patient had fallen in love on two occasions with elderly men, who on analysis proved to be father images, just as both the husband and I were father images to her.

We see then, that the attitude of these two patients to me, and also their attitude to others was determined by early experiences and by early fixation, the patients at this time unconsciously reproducing long forgotten impressions. As a final illustration of how transference may manifest itself, I shall mention the following case:

CASE VII.—This man on account of his imperfect English was at times at a loss for a word to express his thoughts. On such occasions I attempted to help him out. If I succeeded in getting the proper word, his face lit up with undue joy. If, on the contrary, I did not quickly enough supply the required word or if I gave him an inappropriate one, the patient became irritated and on one occasion very angry, blocking further associations for a short time. I called these phenomena to the attention of the patient and he recalled in connection that very early in his youth, from six years of age on, he looked upon himself and felt that both his own people and others also looked upon him as an outcast, that he was in general an object of pity. He bore a feeling of intense hate toward people on this account. He also recalled that while at school a boy companion, much brighter than the patient, would at times assist him in his lessons, something which made the patient extremely happy. However, if this boy did not assist the patient at his request, the latter became very angry and would not speak to his friend for days at a time, during which period all manner of hostile fancies directed toward the boy occupied his mind.

In this brief communication I have attempted to show the nature of the transference in psychanalysis, and to make it clear by means of illustrations. These illustrations warrant a number of significant deductions. An important one is the fact that the treatment concerns itself also with phases of our patient's emotional life other than the grossly sexual, although on ultimate analysis the instances above cited show an unconscious sexual basis, sex being used in the Freudian sense. Another justifiable conclusion is that since every patient manifests many of the emotions here cited from a number of cases, though caused by different experiences, the entire emotional life of the patient is taken into consideration. Though a patient comes to us with definite symptoms, yet the treatment is directed at the entire emotional life, attempting a reconstruction so that without any conscious attempt on the part of a patient, an emotional balance is maintained.

This leads me to the next well established fact, namely, that it is the emotional infantilism of the neurotic that lies at the basis of his neurosis; the infantilism representing an early fixation, which, though unconscious, is still sufficiently potent to cause him to act on repressed emotions or desires to a greater extent than is true in the case of the normal; that it is this emotional infantilism which causes intense reactions to apparently trivial causes. These causes, however, on deeper analysis show that the reaction had a logical basis.

Another important observation is that neurotics, under all forms of treatment, present similar phenomena, but that under the psychanalytical treatment these phenomena are traced to their source,

enabling the patient to realize fully apparently meaningless thought processes and emotional reactions. In this way the patient is helped to maintain a more healthy emotional attitude toward his environment in general.

Finally I wish to emphasize the fact that the transference creates nothing; it suggests nothing to the patient—it merely serves to displace to the person of the physician, emotions in reality evoked by other individuals or experiences, and having brought about the displacement then enables the patient to attach these "free floating" emotions, of various sorts, to their origin, making the forgotten experiences once more conscious and at the same time innocuous.

40 WEST EIGHTY-FOURTH STREET.

SUBDURAL SPINAL ABSCESS.

Report of a Case. Posterior Lateral Laminectomy. Recovery.

By HARRY LOWENBURG, A. M., M. D.,
Philadelphia,

Pediatricist, Mount Sinai Hospital, and Jewish Hospital.

The following case is sufficiently unique to warrant recording.

CASE.—F. G.; female, age seven years, was seen in consultation with Doctor Kahan. The history was given that the child had been taken ill in another city where she had been visiting. Her malady there had not been diagnosed. Her main symptom was said to have been fever. She was returned home and Doctor Kahan summoned. He diagnosed the case as meningitis and as she did not improve I was asked to see her. She presented an anxious expression; her pulse was rapid and weak; her temperature was 100° F. per rectum. She appeared very ill. She lay in bed with her legs and thighs flexed and complained bitterly when an attempt was made to extend them. This was especially true with reference to left leg. Kernig's sign was present, as was Babinski's sign. Her knee jerks could not be determined. The neck was rigid. Brudzinski's neck and leg signs were both present. She was perfectly conscious; she complained of no headache, nor had she vomited; the pupils were equal. At the bedside I ventured the opinion that she was suffering from some atypical form of meningitis, which at the time I could not determine. I was impressed by the absence of cracking headache and vomiting, so typical of most forms of cerebrospinal meningitis. I suggested her removal to the Mount Sinai Hospital for the purpose of further study. This was done.

Lumbar puncture was immediately done in the sitting posture at the usual site. The canal was easily entered, as was noted by the sensation transmitted to my finger as the point of the needle passed through the dura. It seemed to be accomplished with such ease as to cause Dr. A. J. Rubenstone, pathologist at the hospital, who was present at the time, to comment upon the fact. This is mentioned as it has an important bearing on the discussion at the operating table, to which reference will again be made. Despite the ease with which the canal was entered nothing appeared for at least one minute at the free end of the cannula. A dry tap was about to be recorded when a drop of thick blood stained yellow pus appeared. Several more drops now slowly followed. The material was immediately subjected to microscopic examination by Doctor Rubenstone, who reported *Staphylococcus pyogenes aureus*. Blood culture revealed the presence of the same organism in the blood. A bad prognosis was given and the diagnosis of staphylococcic meningitis was made. This was subsequently proved to be incorrect. An attempt was now made to secure antistaphylococcic serum, the idea being to inject this directly into the canal. This was found to be impossible. A vaccine was made from the pus for hypodermic use. It was decided to irrigate the canal with normal saline solution. This was done immediately with

very unsatisfactory results, for while the fluid would enter readily it would not flow out and had to be withdrawn with suction, as the needle became clogged with pieces of fibrin and pus. The case seemed hopeless. It then occurred to me that if drainage was the only thing to do in the attempt to save the child's life and since it was unsatisfactory to drain by irrigating through a hollow needle, nothing would be lost by instituting direct drainage and by providing a more satisfactory method for irrigating by means of a posterior laminectomy. A large opening would thus be secured to allow the free escape of pus and irrigation could be accomplished with ease. The proposal to carry out this surgical procedure was made to my colleague Dr. Max Staller, surgeon at the Mount Sinai Hospital. The consent of the parents and the family physician having been secured, Doctor Staller kindly consented to operate. This was done the evening of the same day that the child was admitted to the hospital. The danger and the apparent hopelessness of the case were explained to the family.

The patient was prepared and etherized in the usual manner. An incision in the middle line, extending over the spines of the third, fourth, and fifth vertebrae through all the tissues to the bones was made. As Doctor Staller was attempting a blunt dissection to separate the muscle fibres, thick pus was seen to exude between the layers of muscle and between the layers of fascia. Now the questions arose, where was my needle when I made the original lumbar puncture, where did this pus come from, and had the point of the needle been in the canal or between the muscle fibres? It is here that I wish to refer to the remarks of Doctor Rubenstone, as quoted above and made at the time of the lumbar puncture. In order to verify that the pus came from the spinal canal, the somewhat hazardous course was decided upon to do a second lumbar puncture at the operating table at the original site. This was done through the exposed muscle and pus was returned. It was now proved beyond a doubt that wherever else pus might be, it certainly existed as well within the spinal canal. After a careful and skillful blunt dissection Doctor Staller exposed the lateral and spinous processes of the third, fourth, and fifth lumbar vertebrae and noted a linear fracture without separation on the lateral process of the fourth vertebrae. From this point pus was exuding. In passing, it may be noted that an x ray picture taken as soon as the patient entered the hospital failed to reveal this fracture. The diagnosis was now clear, viz., a subdural spinal abscess in the lumbar region originating from a linear fracture without displacement of the fourth lumbar vertebrae. At the time of the operation we could not determine that this was not a pathological fracture. Subsequently it was learned from the parents that while at play in Brooklyn the child had been struck by a playmate upon the back with a checkerboard. Nothing serious seemed to follow this injury immediately and it was forgotten, until the direct question in reference to trauma was asked after the operation. It was now decided to do a posterior laminectomy as originally planned, not, however, for a supposedly hopeless case of staphylococcic cerebrospinal meningitis but for a case of subdural spinal abscess. Thus an incorrect diagnosis, made by myself, for which a new line of treatment had been proposed by me, led to the application of this same treatment to the correct condition. The prognosis immediately became brighter. The original incision, though unintentionally so, really now assumed the rôle of an exploratory operation, for without it the exact nature of the trouble would not have been discovered and the child would in all likelihood have died. Doctor Staller now proceeded to perform a right posterior lateral laminectomy of the fourth and fifth vertebrae. These vertebrae were selected instead of the one which showed the linear fracture because of their lower situation, the opening at this point, therefore, providing better drainage, and because pus was discovered originally by lumbar puncture at this point. The canal was irrigated through this opening and packed, the wound dressed in the ordinary way and the child returned to bed. Subsequently Doctor Staller gave the wound the usual surgical attention applied to infected surgical wounds. In addition the child received injections of the autogenous vaccines prepared by Doctor Rubenstone.

She remained in the hospital several weeks and made

slow but satisfactory progress toward recovery. After removal to her home the dressings of the wound were done by Doctor Kahan. She is now perfectly well and able to be about, and unless restrained, would run and play with her mates as before. A little stiffness of the legs at first remained but this has entirely disappeared.

1927 NORTH BROAD STREET.

FACIAL PARALYSIS FOLLOWING INFECTION OF THE EXTERNAL AUDITORY CANAL.

Radical Mastoid Operation. Recovery.

BY A. NOAH SCHILLER, M. D.,
New York.

It is unusual for infections of the external canal wall to extend to the middle ear. There is, however, a condition which differs from the class of cases that are always due to an infection of the hair follicles in the cartilagenous portion of the canal. These cases cause a diffuse infection of the canal wall without localization. Unless there is an early incision, although pus is seldom obtained, a necrosis of the cartilage occurs. In the past two years, I have seen two such cases. Both patients were women, about sixty-five years of age, whose general health was poor. The first patient was seen two years ago. After three months of constant attention and after having removed one-third of the cartilage of the canal wall, I was able to check the infection. The second case I now report.

CASE.—The patient was sixty-five years of age; past history was negative. Her present illness began in April, 1917 when she complained of pain in the left ear. On the advice of friends she irrigated her ear; she continued this method of treatment for a month. Observing that the canal of the ear had become swollen and that pain still continued, she consulted her physician. The patient was under the care of her physician for two months. During this time he incised the canal wall three times to relieve pocketing of pus. For a time the patient was relieved of pain, but this was soon followed by a return of all the symptoms. On July 18th, looking into the mirror, she noticed that the left side of her face was paralyzed. The case was referred to me, and the patient admitted to the Philanthropin Hospital.

The left auditory canal was markedly infiltrated and had a profuse discharge. The canal was cleaned, and on probing, necrotic cartilage was felt. The drum could not be seen because of the edema of the canal. There was a complete paralysis of the left facial nerve. Examination of the urine showed sugar, acetone, and diacetic acid. The diagnosis of facial paralysis due to middle ear necrosis was made. A radical mastoid was performed under a local anesthesia of 0.5 per cent. novocaine solution. Injections were made under the periosteum of the fossa mastoidea and at the centre and apex of the mastoid. The canal wall was anesthetized by subperiosteal injections at the junction of the cartilagenous and bony portions of the wall. Some of the fluid was injected under the periosteum of the bony portion of the canal in the direction of the antrum of the mastoid. Two sections of cartilage, each about one quarter by three quarters inch, were removed from the canal; these were the necrotic areas of cartilage that I felt on probing. A radical mastoid operation was done and the posterior incision closed. There was no reaction following the operation. The patient was put on a diet for diabetes, and in two weeks was free from sugar and acidosis. About three weeks after the operation improvement was noticed and the paralysis became less marked. Three months after the operation all traces of the facial palsy had disappeared. The ear discharged for six weeks and has since been dry.

There was a question in my mind, after the examination, whether to operate at once or to wait until the acidosis was removed. The danger of waiting would have been that whereas there might be only an irritation of the facial nerve at that time, if I waited the nerve might become macerated and the paralysis permanent and beyond surgical help.

1855 SEVENTH AVENUE.

Pyeloscopy and Pyelography in Differential Diagnosis of Renal Conditions.

—At a joint meeting of the Philadelphia County Medical Society and the Philadelphia Röntgen Ray Society, December 12, 1917, Dr. Willis F. Manges, of Philadelphia, president of the American Röntgen Ray Society, stated that the term pyeloscopy was used to describe the fluoroscopic observation of the flow of the opaque solution into the kidney pelvis and calyces. By the combination of pyeloscopy and pyelography it was hoped to show the importance of differential diagnosis in renal conditions, and especially in the case of renal calculi. The radiologist must depend upon the cystoscopist to catheterize the ureters and manipulate the apparatus for the injection of the opaque solution. Pyeloscopy and pyelography were to be regarded as supplementary to clinical and other laboratory methods of diagnosis, including radiography, and as especially valuable in cases in which the different phases of diagnosis are not clear. One of a number of interesting lantern slides exhibited showed an unusual point in differential diagnosis. The case presented a mass in the right upper abdomen having the size, shape, and firmness of a kidney. Many of the symptoms, especially those of pain and tenderness in the loin, were referable to the kidney. With one hand on the abdomen and the other on the back the mass could be felt by both hands and was rather freely movable. A definite shadow appeared on the radiograph, having a shape similar to that of the lower pole of a kidney, but perhaps more dense. During the pyeloscopy examination the mass could be felt and its shadow seen on the screen, so that with an opaque solution in the renal pelvis visualizing the kidney, it was possible to observe the mobility of the mass and also that of the kidney pelvis. The kidney could not be displaced by palpation, whereas the mass could be moved more or less freely; it was clearly on a plane anterior to that of the kidney and moved toward the median line to such an extent that the outermost point of the kidney calyces appeared beyond the mass. The last observation was clearly demonstrated on the slide. At operation in this case a pendulous and greatly distended gallbladder had been found. In the author's opinion, pyeloscopy should be practised whenever the kidney pelvis is to be injected for pyelographic purpose. Among the advantages of the process are removal of danger of overdistention, visual control of flow of solution, and the possibility of making the pyelogram at the proper time.

Our Readers' Monthly Prize Discussions

Twenty-five Dollars Is Awarded for the Most Satisfactory Paper

All persons, whether subscribers or not, are invited to compete for the prize of \$25 offered for the reply deemed best by the editors to the following questions:

CXCII.—How do you treat lobar pneumonia? (Closed.)

CXCIII.—How do you treat whooping cough? (Answers due not later than March 15th.)

CXCIV.—What kind of feet must a soldier have? (Answers due not later than April 15th.)

The award will be based solely on the value of the information contained in the answer. No importance will be attached to literary style. Answers should preferably contain not more than six hundred words, and should be written on one side of the paper only. All papers submitted become the property of the JOURNAL, and should bear the full name and address of the author for publication. The prize will not be awarded to the same person more than once within a year.

The prize of \$25 for the best answer to Question CXC has been awarded to Dr. T. J. Tuder, of Keokee, Va., whose paper appears below.

PRIZE QUESTION NO. CXC.

TREATMENT OF BURNS.

By T. J. TUDER, M. D.,
Keokee, Va.

Since the results are about the same clinically in burns occurring from contact with dry heat, acids or caustics, and scalds from hot liquids or steam, the treatment, in a general way, excluding the neutralization of the caustics, is the same. Severe burns are always accompanied by shock. Morphine hypodermically for the pain, used with extreme caution or omitted in children, and stimulants, such as atropine, camphor, caffeine, or digitalis, should be administered at appropriate intervals. The patient should be well wrapped in warm blankets, hot water bottles placed about the unburned parts of the body, pillows removed from under the head, and the foot of the bed elevated, if necessary. During the stage of severe shock, normal saline warm, with a little adrenalin added, or glucose soda solution should be administered continuously by enteroclysis, and when practicable, the patient may be immersed in a continuous hot saline or boric bath until reaction is evident. If the condition of shock is grave blood transfusion and oxygen inhalations should be employed.

Cleanse the burned area as effectively as possible with warm phenolated solution, a moist compress of neutral solution of chlorinated soda left applied for ten minutes, or, if there is much dirt or grease, 0.5 per cent. iodine in benzene. A saturated solution of bicarbonate of soda is very effective in relieving pain. The burned part may be immersed in it or covered with gauze kept continuously wet with this solution. A paste, made by adding boiled water to bicarbonate of soda and applied over the burned area is an ever available home remedy for burns. Picric acid, in the strength of 0.5 to one per cent. aqueous solution, is a most desirable moist dressing for burns of all degrees of severity. It is nonirritating and analgesic, it coagulates albumin, a protective scab is formed by coagulation of the secreted serum, the ruptured lymph spaces are sealed, the exposed nerve endings protected, and the wound is splinted so that epithelial proliferation may proceed. Ehrenfried concluded after extensive experiments that picric acid is fifty times more effective as an antiseptic than the same strength phenol solution, hence this treatment is particularly desirable in septic cases. Sterile

gauze is applied in several thicknesses over the burn and thoroughly saturated with the picric acid solution, and over this oiled silk and a gauze bandage are applied. On the third or fourth day the dressing is renewed, after all vesicles are punctured, and this is repeated every four or five days or oftener if there is much infection. If the urine becomes cloudy, stop these applications.

The open air treatment is the best for burns of the face and other exposed parts of the body and where cleanliness can be maintained. In this treatment, blebs and all necrotic tissue are removed as soon as practicable and the entire area is left open; the lesions are exposed to the sunlight at first for half an hour, this period being gradually increased to an hour or more each day. The temperature of the room is kept high to favor drying and the action of the skin. Bland dusting powders, such as stearate of zinc, zinc oxide, or one part salicylic acid to three parts boric acid, are applied daily. Vesicles are evacuated as soon as formed, and when pus appears the scabs about it are removed and the parts thoroughly cleansed. The pain under this treatment usually soon subsides, but, as the suffering is ordinarily more intense in burns of the first degree because the nerve endings are exposed, whereas in those of the third degree they are destroyed, in the former I have frequently employed the picric acid applications for the first few days, especially when the pain at first was agonizing, and then later resorted to the open air treatment.

Ambrine, which its originator, Dr. Barthe de Sandfort, a French surgeon, states is composed of paraffin, resin, and oil of sesame, has been gratuitously advertised since 1916 by numerous articles in the lay and professional press. Like most secret remedies, its composition has varied somewhat from time to time. It, or similar preparations, are widely sold in this country under various trade names. Lieutenant Colonel A. J. Hull, of the British Royal Army Medical Corps, after much experimentation, introduced the following prescription, which is the most satisfactory of the paraffin preparations I have known, and, while it is not claimed to be identical with ambrine, it is believed to embrace all the virtues of that exploited article:

Resorcin,	1 per cent.
(or Betanaphthol, 0.25 per cent.)	
Eucalyptol oil,	2 "
Olive oil,	5 "
Paraffin, soft,	25 "
Paraffin, hard,	67 "

It is important to secure a good grade of paraffin. After the preliminary cleansing, the burned area is thoroughly dried by fanning, or with a small warm air electric blower, such as hairdressers use for drying hair. A thin layer of this preparation is now applied with a camel's hair brush, or better with a spraying device, sufficiently warm to be liquid and not hot enough to be uncomfortable to the patient. Sollmann has advised that this initial application be of liquid petrolatum, with which any analgesic, antiseptic, or epithelial stimulant may be combined as desired. Practically all of such agents combined in one of these solid paraffin preparations are hermetically sealed and retained within, and only a minute quantity is free to have any therapeutic action. Following this, apply a layer of cotton as thin as can be gotten from the roll, and then with spray or brush another warm liquid layer of the paraffin prescription. This is allowed to harden. A thicker layer of cotton and the bandage complete the dressing. Thus is made a mechanical splint for the wound and a scaffold for feeble granulations. The dressing is impervious, and when it is removed daily, at first and as improvement is evident every other day, an abundance of seropurulent exudate is usually found covering the burn. This is thoroughly cleared away with warm sterile water or other bland irrigations and the wound carefully dried before a new paraffin dressing is applied. If the area is very septic, hot boric fomentations replace the paraffin treatment during the third and fourth day after the infliction of the burn. This popular revival of the old ointment treatment with improved technic is ideal for shallow burns where infection may not be expected, and under skilful direction it has a field of usefulness, but it cannot be counted upon for the uniformly spectacular results that many have been led to expect from its use.

Whenever there is loss of skin and not sufficient islands of epithelial cells scattered about over the burn to insure prompt regeneration, grafts should be applied as soon as the area is granulating and sufficiently free from infection. Scarlet red in an ointment of from five to ten per cent. strength is a dependable stimulant when epithelial growth is slow. Contractures are to be reduced by the prevention of sepsis, immobilization of limbs affected, early passive motion, massage, etc.

Frequent examinations of the urine should be made. Acute parenchymatous nephritis is a frequent complication, as is also congestion of the respiratory and digestive tracts. Acidosis, more frequent in children, is a complication to be borne in mind and bicarbonate of soda and glucose are the remedies. Curling's duodenal ulcer is usually prevented by concentrated and easily digestible foods and keeping the bowels well open. The kidneys should be kept active and liquids given freely. Tschmarke, Schöne and others have argued that in some way the burned tissues elaborate a toxin, which in many instances is fatal, hence they have urged the prompt removal by vigorous scrubbing in second degree burns and by a sharp knife in those of the third degree of all tissues that have been damaged beyond repair.

Dr. Russell J. Smith, of Pocatello, Ida., writes:

In burns characterized by erythema, moisten the parts frequently with a saturated solution of sodium bicarbonate. In the vesicular stage, open blisters with a sterile needle after irrigating the surface with normal salt solution, a weak solution of chlorazene, or a saturated acid boric solution. Dry thoroughly by fanning or by the use of a hot air electric motor and spray with hot paraffin dressing, cover with thin layer of cotton, again spray, apply a thick layer of cotton, and bandage. In second degree burns, with destruction of skin, and in burns of moderate third degree, irrigate with warm acid boric solution or a weak chlorazene solution, remove all débris, puncture blisters, dry thoroughly, and apply a paraffin dressing. Dress daily at first and then less frequently as progress is rated satisfactory.

If a large surface is burned, remove the clothing carefully after giving morphine to control pain and stimulants to secure reaction. If the patient is chilly and in shock, place him in a warm bath until shock is relieved. Dry the area and spray with wax. At each dressing, remove all detachable sloughs and dead skin, and if blisters form, prick with a sterile needle. In the inflammatory stage, give stimulants and concentrated food, morphine for pain, if severe, aspirin for moderate pain, secure free elimination by skin, bowels, and kidneys, and watch carefully for the development of internal inflammation. In very extensive burns, immersion in a warm bath of normal saline solution is good treatment.

Open air treatment is recommended for less severe burns. Picric acid in one per cent. aqueous solution is used in burns of the first and second degree of limited area. The surface is first disinfected, gauze wet with the solution laid on, and the parts wrapped in cotton and bandaged. The dressings are changed every three or four days. Carron oil is unscientific and is mentioned but to condemn. It allays pain but is unsanitary. Bismuth and zinc oxide in ointment are often used but ointments are not satisfactory. Tincture of iron chloride is painful and can be used over small areas only. It needs hourly applications to be effective and the dressings are painful.

Prevention of sepsis is the important thing, with immobilization of the limbs to limit contractures. In burns of the fingers and toes, separate the digits with gauze to prevent adhesions. If the burns are extensive, graft with skin. If complete charring has occurred, amputate. If suppuration occurs, stimulate. In burns of the mouth and throat, combat shock, give morphine for pain, and ice to suck. If swelling is serious, incise. In burns of the eyes by lime, counteract the caustic by weak solutions of vinegar, and apply an ointment of boric acid to prevent adhesions.

In burns of the esophagus, neutralize the caustic, give morphine for pain, wash out the stomach, and feed by rectum. Three or four weeks later, dilate the esophagus with bougies to limit contraction.

Dr. Walter B. Jennings, of Norwich, N. Y., writes:

The treatment of burns is local and general. The local treatment consists in treating the injured surfaces of the body. The general treatment is directed toward the quieting of the nervous system after the injury, the relief of pain, and the treatment of shock which is present to a greater or lesser degree in all cases of severe burns. In cases of slight or moderate burns, nothing relieves the pain so well as a wet dressing of a saturated solution of baking soda. A mixture of linseed oil and limewater, equal parts, together with carbolic acid, one part to twenty parts of oil, to keep the solution antiseptic, gives great relief and when the carbolic acid is added serves to act as a local anesthetic. This dressing should be changed every twenty-four hours. After three days, a saturated solution of boric acid should be substituted. In severe burns, remove clothing with great care so as not to tear the skin. Prick blisters to remove pressure, using a clean needle, wash with warm boric acid solution and apply thymol iodi powder to smaller blebs. When a large surface is denuded, cleanse and apply wet dressing of ten per cent. solution of quinine and urea hydrochloride for pain. It is nontoxic, so there is no danger of absorption. Dress the part to exclude air.

In third degree burns, with destruction of tissue, treat like any infected wound. Remove dead tissue, while the patient is under ether if necessary, irrigate, and dress with the usual antiseptic dressings. If much tissue is lost, it may be necessary to use splints and sometimes traction. In this way one is able to overcome cicatricial contraction. When the granulations are in good condition skin grafting completes the treatment. After the third or fourth day cold cream, boric acid unguentum, ichthyol unguentum, or twenty grains of alum in petrolatum to make one ounce, or combined with zinc stearate unguentum aids granulations.

In some cases shock is so great that the physician must treat that before the local burn. The pulse is slow, temperature subnormal and the patient is in a general collapse. Stimulate hypodermically using 1/30 grain strychnine sulphate and 0.1 grain digitalin. External heat should be applied to the body and extremities. Lower the patient's head and raise his hips. In other cases where pain is the most prominent symptom, give hypodermic of 0.25 to 0.5 grain morphine. If the patient is able to swallow give hot drinks, a tablespoonful of whiskey to a glass of hot water, or one dram of aromatic spirits of ammonia in water. In treating these cases always bear in mind the relationship of skin, lungs and kidneys. Breathing may be stimulated by 0.01 grain atropine sulphate. A half teaspoonful of cream of tartar to a glass of water with a little sugar is a good diuretic. Ten minims of spirit of nitrous ether added to the above will also make a pleasant drink. Five grains of urothrin three times a day will prevent infection. It is well known that duodenal infection occurs occasionally so the intestinal tract must be kept open. Fluid food should be given at first and later general tonics to support the system. Burns produced by strong acids or caustics, as well as electric burns are treat-

ed in the same way. It seems to the writer that the latter heal more slowly. X ray burns are rarely, if ever, seen by the general practitioner. The chronic form of x ray dermatitis is beyond doubt a skin cancer. Nothing has been said about the prophylaxis of burns. Yet much has been accomplished by the State in passing laws relating to fusion point of oils, storage of combustibles, etc., the medical supervision of factories together with proper instruction of children and the general public in the "safety first" use of matches.

Dr. Charles C. Henin, of Springfield, Mass., says:

In the treatment of burns or scalds the indications are to relieve shock, alleviate pain, prevent secondary inflammation of internal organs, favor the separation of sloughs, support the general system, and prevent deformities. To carry out these objects both constitutional and local treatments are necessary. Shock demands immediate attention. Opium in some form must be given to allay the dreadful distress which patients experience. Collapse calls for stimulants. When there is difficulty in swallowing, the anodynes can be used hypodermically and stimulant can be administered by the rectum. External warmth must be applied to the spine, extremities, and epigastrium. This can be done by means of heated bricks or bottles or hot water bags.

Burns have been variously classified according to the depth to which the tissue is destroyed as first, second, and third degree. In first degree burns the symptoms are swelling, redness, and tenderness of the skin. The chief treatment is the relief of pain. This can be accomplished by smearing the surface with light ointments such as rose water ointment or cream. Recovery follows the application of any nonirritating substance. In burns of second degree much of the epidermis is destroyed. There may be blisters full of serum or the injured epidermis may have been removed. There is redness, swelling, and tenderness and more or less free oozing of serum and some blood. The treatment consists of dressing the burn, e. g., with an ointment of boric acid and vaselin. This spread over the burned area with a spatula; dry gauze can then be applied and the dressing fixed by a loose bandage. Gauze saturated with a one per cent. solution of picric acid and applied is a good dressing. My favorite is a four per cent. solution of aluminum acetate. The gauze is saturated with it and kept wet by the addition of sterile water from time to time. If it is decided to treat the burn by dry method it may be left exposed to the air and dusted with a powder, as bismuth subnitrate or subgallate. In burns of the third degree, portions of the corium and possibly still deeper structures have been destroyed. Three indications are the relief of pain, protection of the injured but living tissues, and drainage of any pus pockets which may form. A moist antiseptic dressing is the best. It should be applied warm and kept warm. In most cases I give 0.25 grain of morphine hypodermically. Sloughs should be cut away as soon as they loosen. If large areas are burned skin grafting should be resorted to.

(To be concluded.)

Medicine and Surgery in the Army and Navy

TREATMENT OF WAR WOUNDS OF THE BRAIN AND ITS COVERINGS AT CASUALTY CLEARING STATIONS.

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If wounds of the brain are left untreated until inflammation has obtained a hold, results to life and function are, on the whole, more disastrous than in wounds of other parts of the body. Because of the importance and delicacy of the structure, abnormalities, whether in the form of microbic infection, displaced fragments of bone, foreign bodies, blood clot, or pulped tissue, are apt to have far more serious and sometimes more rapid lethal effects than in other structures. Further experience has not inclined me to deviate in the least from the principles which I enumerated in a previous communication (1). The principles then enunciated were: 1. Infected gunshot wounds of the skull and brain require more careful consideration and prompt attention than similar wounds of any other part. 2. We can combat and prevent sepsis best by early and complete operations. 3. We can prevent permanent disability in most cases by systematically removing foreign material or displaced bone from the surface or substance of the brain whenever these are accessible to legitimate surgery. 4. By these precautions, the immediate results in the saving of life and more rapid restoration of function, when that is possible, are better than those obtained by more conservative procedures.

From time to time during this war there has been manifest a tendency to imagine that modern brains are more submissive to insult than those of our forefathers apparently were. Even yet it is too early to decide this point. All previous experience has shown that the brain, sooner or later, resents the presence of any abnormality in its immediate coverings or in its substance. It is true that some small lesions of the skull or small foreign bodies in the brain have caused apparently no trouble to the patient, even after years have passed, but others, seemingly equally insignificant, have caused intolerable inconvenience, due to late effects on the brain, which removal of the exciting cause has not succeeded in relieving. This is more true, of course, in cases of actual lesion of the brain.

It has hitherto been the aim of military surgeons to remove or ameliorate the physical defects produced by missiles. Removal of displaced bone, foreign bodies, blood clot, or any substance which might interfere with rapid and smooth healing of the brain has been considered to be of the utmost importance no less than the combating of sepsis. We have discovered in this campaign no valid reason to depart from this line of thought. The immediate effect of sepsis, both in increasing the severity of the focal lesion and in causing diffuse inflammation of the brain and its coverings, has been impressed on our minds with dreadful force. The power of

the brain to accommodate itself to extraordinary conditions, or, one might say, the power of one part of the brain to disregard even excessive injury to another part so that what is left "carries on" in a marvellous way, has also been very striking. But who can foretell that, later on, such cases are to be free, as never before, of sequelæ which experience has shown to be so frequently inevitable? Because of that experience and because no one can foresee how soon trouble will arise, it is surely right that we should do all in our power to prevent probable trouble. It is a matter of the greatest importance to establish the best method of preventing or eradicating sepsis, which is such a hindrance both to rapid healing and to successful attack on physical defects in the skull or in the brain. It has been found that septic wounds of the scalp and skull are particularly easy to deal with when compared with others in that they can usually be completely excised, and the scalp sutured without danger. One might almost say that this procedure, in the hands of those who have mastered the necessary technic, has robbed operation of its danger and has enabled surgeons to obtain results which compare favorably with those of operations of equal magnitude in civil practice under ordinary aseptic conditions. These remarks do not apply, of course, to cases in which sepsis has already obtained a firm hold in the lacerated brain. The problems connected with such cases are much more difficult. Apparently success is then dependent chiefly on the provision of suitable drainage—a very easy thing to say!

Fragments of bone, when driven into the brain, are not usually septic at first, but tend to become infected fairly rapidly. Jagged pieces of shell almost invariably carry infection along with them. If large pieces lodge in the brain, results are very bad. Very small pieces, on the other hand, may not cause any trouble, but even they have been found sometimes surrounded by large abscesses. A rifle bullet does not often carry in sepsis which the tissues cannot overcome, but, after lodgment, by virtue of its weight, it travels through healthy brain tissue in the direction of the most dependent part. The brain becomes diffuent under the pressure. Bullets are frequently seen to alter their position within a week to the extent of an inch or more. Here there seems to be an indication for treatment by posture, i. e., make the wound of entrance the most dependent part. At operation rifle bullets have been shaken out along the wound track, a procedure recommended by Bier. It is likely that they would find their own way more readily along a pulped track than through healthy brain. If inaccessible at first they may soon become accessible and be removed by a secondary operation.

The following remarks have, of course, no reference to very severe wounds caused by large pieces of shell, in which such an extensive part of the skull and brain is blown away or where a rifle bullet causes such explosive intracranial effects that the patient does not survive more than a few hours.

We have seen many patients who on admission have been suffering from complete hemiplegia, and whose symptoms have cleared up in such a marvelous and rapid way after operation that only a negligible amount of paresis has persisted. On the other hand, we have seen patients who showed few or no symptoms, but in whom serious complications developed later, the patient dying in spite of operation. It appears, therefore, that one ought not to pay too much attention to focal symptomatology as a guide to treatment, or even in many cases to prognosis.

We have seen many cases with extensive superficial injuries and little or no damage to the brain, and, on the other hand, many cases in which an insignificant looking wound of the scalp and skull was associated with most extensive injury to the brain. While large lacerated wounds are usually most septic and suppuration in the brain apt to become severe, yet we have seen cases of trivial and comparatively clean cut wounds of the scalp associated with extensive fracture and after a few days with such acute suppuration in the brain that only immediate operation saved the patient's life. The size or condition of the wound, therefore, is no indication of how the case will behave.

One is told that edema of the brain and shock or concussion accompanying a serious injury are such that operation at an early stage is dangerous. Yet we know of many patients who are brought into clearing stations in practically a moribund condition who, after immediate operation, in a few hours have so far recovered that they are able to speak intelligently and take food. Their injuries heal up perfectly well afterward. It would thus appear that so called edema and shock are no bar to success. Indeed, it is likely that both edema and "shock" will pass off more quickly when physical defects are remedied, all the sooner the more thoroughly this is done. In wounds of other parts, edema and tension due to interference with the circulation are relieved very rapidly by incision, removal of foreign or lacerated material, and drainage. How much more must relief of the circulation be called for in a closed box like the skull! In serious cases delay does not, therefore, seem advisable. The use of life saving steel helmets has undoubtedly introduced a difficulty in some cases, which is absent in those who have not been wearing a "tin hat" at the time of wounding. In most cases when a wound has been caused by a missile which has sufficient momentum to penetrate the helmet, a variable amount of general brain concussion is produced. This must be allowed for in formulating an opinion. The general concussion is, roughly speaking, greater and more lasting than that caused by a small focal force which has to overcome the resistance of the skull alone.

In passing, one may be permitted to draw attention to the value of local anesthesia for most of the cases, and especially for the type just referred to. The solution need be injected only into the scalp tissues and pericranium. The skull, dura, and brain will thereafter be found to be insensitive. If adrenalin is mixed with the solution, bleeding from the scalp is reduced to a minimum. If the patient is conscious, it is advantageous to administer

morphine, or preferably pantopon, until he is decidedly sleepy. In some cases, nitrous oxide or a few whiffs of chloroform or ether can be given if much complaint is made of the pain of the injection.

After consideration of all these facts we are driven, in deciding upon a course of action, to pay more attention to the probable mechanical effects of the injury and the potentialities for infection rather than to worry much over the presence or absence of definite symptoms. The lesion is a traumatic one, the possibility of sepsis is great, and things should not be left to chance or until the development of some particular symptom. One must risk misinterpretation when one says such things. One does not wish in the slightest to depreciate the value of clinical investigation. Timely and effective operation does not interfere with that. There is no doubt that the lesions one has to deal with are chiefly mechanical and microbic, and must be treated by mechanical and antimicrobial remedies. If the mechanical disabilities are not relieved, the complicating infection has potentialities greater and more serious than in wounds of other parts.

While it is evident that the thorough removal of physical defects is desirable at as early a date as possible, there are objections to this, of which the most important is that patients do not travel well until at least a week or ten days after operation. During a period of active fighting it may not be possible to treat them all at the front. Only the least serious should be sent to the base at once, so that they may arrive before sepsis has got a firm hold. At the front nothing should be done in such a case beyond removing any visible foreign material, cleaning the wound of the scalp and keeping it open by gauze or rubber tissue, after possibly inserting some of the recently recommended antiseptic pastes, sterilizing the surrounding skin and applying a suitable dressing. This dressing should not exert direct pressure on the wound which will prevent escape of discharge. A small roll of folded gauze on each side will obviate this. Mere excision of the scalp wound in an attempt to prevent septic developments only makes the task of the operator at the base a more difficult one and apparently entails greater risk to the patient. Incomplete operations give bad results. If operation is undertaken the accessible parts of the wound should be treated thoroughly or not at all—all or nothing! If a missile is beyond reach of legitimate surgery—beyond reach of the finger—it should as a rule be left until a later date when it can frequently more easily be approached by a new route. It must be remembered that average cases arrive at the clearing stations really in a less septic condition, although the wounds may be superficially badly soiled, than they do at the base, and results in similar cases should on that account be more favorable.

Excision and suture of scalp wounds are said by some to be unnecessary. Such a judgment depends on the point of view. These excisions, while they do no harm when proper technic is employed, make the patient fit for duty again in a much shorter time; they establish a diagnosis of fracture in most cases with absolute certainty; there is no doubt that

thereby they occasionally save life; they certainly prevent troublesome sequelæ; they save time and trouble on the part of the attendants; and they save expense in dressings. The original mastisol and and gauze dressing may be left until the wound is healed (2). Captain J. E. H. Roberts, recording 412 cases of excision of scalp wounds, states that only in twelve did failure to obtain healing by first intention occur. Three wounds gave way completely. In the others, slight gaping, sloughing, or stitch suppuration occurred. In one case a gap, six inches by three, was successfully closed by sliding flaps.

It has been shown repeatedly during this war that a pronounced depressed fracture of the inner table, although the dura may not be lacerated, is accompanied by a localized, usually more or less cone shaped bruising or pulping of the underlying brain. The base of the cone corresponds roughly to the area of comminution of the inner table. Owing to its elasticity the inner table must always be depressed considerably before it fractures, and the sudden localized blow on the brain causes the pulping. The depth and severity of the pulping varies with the depth to which the inner table has been depressed. The amount of depression necessary to cause fracture varies in different parts of the skull. Such injury to the inner table and brain may exist without a trace of injury to the external table. In very rare cases intracerebral hemorrhage, sufficient to cause severe pressure symptoms, may occur. The pulped area, a mixture of useless brain matter and blood, is an immediate source of irritation to the surrounding brain, because it is virtually a foreign body. In the process of healing a great part of it is replaced by "fibrous" tissue—a scar—which forms a remote source of irritation. The pulped mass is liable to become infected and to form a localized abscess or to lead to spreading encephalitis or meningitis, especially if the wound superficial to it is not rendered aseptic at an early date.

In cases where the force has been so great that the dura has also been ruptured, although pieces of bone have not penetrated, a definite pulped track, extending even for a couple of inches into the brain, may be found. This, when explored by the finger, resembles closely the track made in the brain by a foreign body. This shows the necessity for using x rays before operation to reveal whether or not a metallic foreign body is present. Operation should not, however, be unduly delayed in order to have this done. If the foreign body is beyond the reach of the finger, it is usually beyond the reach of legitimate surgery so far as the primary operation is concerned. By fitting together the fragments or the inner table one can often ascertain, with fair accuracy, whether any fragments of bone have been forced into the brain. The mass of disintegrated brain matter and blood, whether on the surface or in the depth of the brain, interferes with the local circulation, and by this alone causes irritation similar to a solid foreign body. After its removal from either situation, pulsation usually returns at once.

Such lesions may be accompanied by persistent

headache, focal spasm, often evanescent, or paralysis, or even "optic neuritis." Their presence can usually be recognized, after the dura has been sufficiently exposed, in that the dura is somewhat discolored, the brain does not pulsate freely, and the area feels doughy instead of elastic or springy. When the dura is opened, the pulped material wells out like grease from a collapsible tube. Pulsation returns very quickly. If healthy brain matter is forced out, this indicates excessive intracranial pressure, and lumbar puncture should be done at once. A small drainage tube, down to the hole in the dura, may be left in the wound for twenty-four hours. The dura is usually opened by a small crucial incision. The angles of the flaps can be drawn together again accurately by a single suture passed through them, if it is thought desirable and safe. The pia arachnoid may also be unruptured. In such cases it is necessary to help out the pulped material by inserting a small forceps and carefully opening the blades. Symptoms are usually relieved within a very short time. This relief is often most striking when the dura is opened at a second operation, the first, removal of depressed bone, having failed to relieve the symptoms. To my knowledge the dura has been opened deliberately in several scores of cases, with only one fatality. The effect has been immediately and uniformly beneficial. It is essential for safety that, before opening the dura, an aseptic field of operation is obtained.

Operations where wounds of the blood sinuses are present are done as a matter of course, because it is thought advisable to remove depressed fragments of bone or foreign bodies which cause obstruction to the return of blood from any part of the brain and which may be or may become soiled and cause septic thrombosis. It seems all the more desirable to remove such fragments if they actually penetrate the wounded sinus. The operation in itself is not a dangerous one if proper technic is employed. For example, fourteen cases in one series after a battle were operated on. Only one man died, and he had severe laceration of both cerebral hemispheres, besides the wound in the longitudinal sinus.

It is difficult to formulate any hard and fast rules about drainage of the brain. On the whole, it is probably best not to drain unless one is forced to do so. The presence in the brain of definite pus, infected blood clot, inaccessible, definitely infected foreign bodies, or profuse oozing from a seriously lacerated area are the chief indications for it. If, when operating some days after receipt of the wound, it is found that pus is absent from a track which foreign bodies have made, it is usually unnecessary to drain. In some cases one may feel, however, that it is safer to insert a short drain for twenty-four hours or so. When aseptic foreign bodies, such as bone fragments, have been extracted, or when an area or track of pulped brain matter has been evacuated in which no penetration of foreign bodies has occurred, it is unnecessary to drain the cavity in the brain, but a quarter inch rubber tube or folded rubber dam should always be inserted, from the angle of the wound, down to but not into the opening in the dura, for twenty-four hours. If

pus, smelly blood clot, clothing, hair, or a large jagged piece of metal is evacuated from the depth, a drain should always be inserted into the track, and it should be brought straight out through an unsutured part of the excised wound. Bacteriological examination of what is removed should always be made, even though actual pus is absent. If streptococci are found, drainage should be maintained until the organisms disappear or become very few in number. If streptococci are absent it is fairly safe to be guided, as to time for removal of drains, by clinical signs alone.

It should be remembered that foreign bodies, especially flat pieces of bone, compress the brain in front of them; therefore, although they may be found at a depth of, say, one and a half to two inches, it is not necessary to push a drain in to that depth. The distal end of the track will, after extraction of the foreign body, be found to have approached considerably nearer the surface of the brain. If one attempts in such a case to push a stiff drain in for a couple of inches, there is a great likelihood that the lateral ventricle will be perforated by it. One should, immediately before inserting the drain, gently explore the track with the finger, and push the drain in only so far that it will not quite reach the extremity of the track. As a rule, the drain should be shortened slightly every day or every second day unless pus continues to discharge from the depth in fair quantity. It should be borne in mind that a drain, especially a rigid one, acts like any other foreign body, and may stimulate pus formation, besides providing a channel for possible entrance of fresh infection. All drains should on this account be removed as early as possible. In most cases they can be taken out on the second day.

Rigid drains are harmful to the brain, especially those with holes cut in them. The intracranial pressure may force normal brain through the holes or end of the tube. The constant friction of the pulsating brain against a hard foreign body must have a bad effect. The most satisfactory drain, on the whole, seems to be a piece of jaconet, batiste, or similar substance, folded concertina wise. No apparent harm has followed the insertion, on the point of the finger, of a small amount of a paraffin paste, "bipp," flavine, brilliant green, or chloramine-T, etc. In certain cases, where the pus is particularly thick or profuse or where streptococcal infection is present, it may be advisable to insert in addition one or two narrow tubes. Antiseptic solution or thin paste may be instilled gently, a few drops at a time, every few hours. One must be careful, when inserting a drain, that damage is not done to the healthy brain lining the track. One must therefore note the direction of the track very carefully.

Points constantly to be kept in mind.—1. There may be multiple injuries; therefore always have the whole scalp shaved.

2. The force causing the injury is usually very circumscribed, and its effects are therefore likely to be localized to the immediate neighborhood of the part which has been struck. Injury by *contre coup* has rarely to be considered. Examples of this are

more frequent since the introduction of the steel helmet.

3. Such localized forces, if they have been great enough to cause depressed fracture of the inner table, result practically always in definite injury to the brain, which asserts itself by immediate or remote cerebral disability. This may occur in pronounced form, although the dura is uninjured; in rare cases it has occurred even when no fracture of the external table has been seen. One need not refer to cases of immediate disability. Some interesting examples of remote disability have turned up even in France. We have seen a good many cases now of men who were wounded early in the war and whose wounds were considered so insignificant at the time that the patients were not even sent down the line. Later they were invalided on account of symptoms caused by the physical defect of the skull, to wit, depressed fracture of the inner table, which, of course, was treated without more delay.

4. Experience has shown that a properly conducted, complete operation, while it cannot undo the already existing damage to the skull or brain, facilitates repair, gives better immediate results, and tends to prevent troublesome sequelæ more surely than an incomplete one.

5. Death is due, practically in all cases which reach the base, to the effect of sepsis on the damaged brain. In any case sepsis will increase the amount of damage to the brain. The local injury, when thus complicated, is likely to interfere with intellect or set up permanent paralysis. Apart from that, sepsis may cause necrosis of bone and thus prolong convalescence. The necessity for early operation is evident.

6. As our efforts will therefore be nullified in large measure unless sepsis is overcome, all operations must be preceded by removal of the sepsis from the area to be dealt with. Excision or cauterization of the infected parts is the most rapid and certain way of doing this. It is only in very rare cases that this is not feasible. If it is not, the patient has probably very little chance of pulling through. The wound of the scalp and pericranium must be removed *en masse*. The fractured bone must be nibbled or trephined away. Proper technic is essential to success. It must be pointed out that to excise the wound after turning down the flap is merely courting disaster. The brain cannot be dealt with so vigorously, but removal of pulped useless material and foreign bodies will allow it to combat more successfully any infection. "Healthy brain substance possesses considerable power of limiting microbic invasion," but one cannot say that pulped brain or brain with foreign bodies embedded in it is healthy. As already indicated, in the majority of cases in which bone fragments alone are forced into the brain, the track leading down to them is not infected at first, but it rapidly becomes so.

7. Foreign bodies in the brain act deleteriously in four ways: 1. By their direct effect on the delicate pulsating brain tissue. 2. By favoring the development of sepsis. It is practically an everyday occurrence during a rush to find suppurating around pieces of bone lying at the end of a track in the

brain. 3. By interfering in rather an obscure way with the circulation of the brain. A mass of pulped brain matter acts in the same way. It is very common to find that the brain, when exposed at operation, does not pulsate, or does so only to a slight extent, until the fragments of bone or disintegrated matter are removed from the depth, when it begins to pulsate freely. A normal circulation is essential to satisfactory recovery. 4. By causing, when they become encapsuled, a localized connective tissue mass which may act as deleteriously as a tumor. If recovery of function is possible, early removal of foreign bodies will procure this more certainly, more rapidly, and probably more completely than is otherwise feasible; a great improvement is frequently noted within twenty-four hours. If carefully done, further damage to the brain is not appreciable. In only one case have I seen any immediate increase of paralysis follow when an unusually large piece of bone had to be removed from a suppurating track. One will likely do less harm to the brain in removing a foreign body through an already existing track than by cutting a way through a mass of fibrous tissue, or, worse still, healthy brain, as has to be done when the operation is postponed till the scalp has again become intact.

8. It is highly desirable to try to prevent the formation of cicatricial tissue whether on or in the brain, even though in the latter case it may resemble neuroglia. Such scar tissue acts as an irritant chiefly by preventing normal movement of the brain, by interfering with the circulation and in many cases by causing pain. The nature of the injury, the amount of sepsis, the presence or absence of foreign bodies, and the treatment employed have much to do with the amount formed. Unsuitable drains, especially when kept in for a long time, stimulate its formation. The trephine opening should be covered completely with healthy scalp. If plastic flaps are used at the end of the operation to cover the defect, it is found that the line of suture usually lies over intact bone. It is dangerous to replace any of the fragments of bone because they are likely to be infected. The scalp wound, after excision, can usually be accurately sutured over the opening; in some cases it may be necessary to perform a plastic operation by sliding flaps. This is greatly preferable to merely covering the exposed brain by a flap of muscle, pericranium, or aponeurosis. Such a flap, if exposed at the bottom of a wound, is apt to necrose. In any case, the amount of cicatricial tissue and of permanent adhesion is greater in a wound which heals by granulation than in one which heals by first intention. It is true that Nature has a marvelous capacity for remedying defects, even by making a new dura. The greater the amount of abnormality, however, with which she has to cope, the greater will be her difficulty in imitating the *status quo ante*. Therefore we should help her in every possible way. When this help is given efficiently, the wound responds by healing *per primam*.

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(To be concluded.)

CARDIOVASCULAR EXAMINATIONS OF DRAFT CANDIDATES BY THE LOCAL BOARDS.

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My experiences in the cardiovascular examination of candidates at one of the local examining boards last summer, especially in view of the new draft, make the following observations seem of practical importance at this juncture. Men of the draft age, i. e., between twenty-one and thirty years, who present themselves for examination before the local draft boards may, in regard to cardiovascular conditions, be divided into two groups: 1, those with frank, unmistakable cardiovascular disease, and, 2, those with physical or clinical signs which resemble and may be mistaken for real cardiovascular disease.

EVIDENT CARDIOVASCULAR DISEASE.

By far the larger percentage of candidates in this category has valvular lesions; the smaller group comprises those with hypertensive cardiovascular or cardiorenal disease. Myocarditis as an entity in the adult of the draft age need scarcely be considered because its incidence is negligible and its discovery and diagnosis as a single pure lesion are surrounded by pitfalls and mistakes. It is not within the scope of this paper to describe, discuss, and repeat the textbook types of valvular murmurs with their areas of greatest intensity and propagation. It is selfevident that men having valvular disease with signs of advanced or even beginning decompensation are not fit to become soldiers and hence should be rejected. It may later become a medicomilitary problem to sort properly the valvular cases which are perfectly compensated and present no symptoms, and whose lesions have been quiescent for years. I have met men, for example, who knew of their lesions and yet were sufficiently patriotic to wish to enter the army in any capacity. One such case was that of a young lawyer, twenty-three years of age, who had mitral regurgitation for ten years and who in order to prove to himself his capacity for marching and for exertion, had taken a fifteen mile hike. Examination by me the next day revealed no ill effects from the walk. I also recently had the opportunity to examine two infantry recruits in one of the cantonments, both of whom had been in camp several weeks, and whose lesions were discovered only while making a routine chest examination. It then appeared that both of the men had known of their valvular disease; both had succeeded in convincing the examining physicians of the local draft boards that they had only heart murmurs and not heart disease; both stood the preliminary training without mishap or symptoms; both were exceedingly anxious to stay in the service. While no special provision is at present made for perfectly compensated cases of this type, it would seem unwise to put them, even if willing, in such laborious service as is entailed in the infantry or engineering. Although statistics are not available, the probabilities seem more in

favor of their decompensating or of their developing the irritable soldier's heart with its tachycardia and other symptoms than those with perfectly normal hearts. Of seemingly equal importance is the possibility that trench and other diseases—trench fever, trench nephritis, catarrhal fevers, pyrexias of unknown origin, or pneumonias—may light up dormant and quiescent endocarditic lesions with resultant syndromes similar to, or as serious as, the usual recrudescences of valvular disease. With cooperation between the medical and the military branches, there seems no harm in admitting these perfectly compensated and quiescent valvular cases into the less laborious work of the quartermaster's or similar departments.

Hypertension for the purposes of draft examination I would define roughly as systolic blood pressure of 150 millimetres and over. Blood pressure estimations have thus far not been done as routine procedures in the local boards. When taken, however, in suspicious cases, and, combined with the presence of albumin and casts in the urine, men with hypertension, even if moderate, should be regarded as unfit for military service. Another group with hypertension is that found in applicants with tachycardia. The desirability of accepting the latter depends not upon the hypertension, even if considerable, but upon the tachycardia, a subject which will be discussed later. Still another group, though small, consists of those with moderate hypertension but with no evidence of renal or cardiac disease. These comprise the cases which in civil practice are usually rejected from life insurance. Repeated examination of the urine and of the heart shows no renal or cardiac disease. I feel that these individuals represent hypertension, temporary or permanent, due to emotional excitement incident to the examination, or to heightened vasomotor tone from obscure through unimportant reflex causes. I believe that when careful and repeated examination of the urine and heart shows no abnormality and the usual symptoms accompanying hypertensive cardiac disease are absent, the applicants should be accepted in the ordinary routine fashion. In civil practice, where I have been able to follow similar cases for some time, the young men have been athletic and have followed their vocations without hindrance or untoward symptoms.

Another temporary cause of hypertension which is usually overlooked is that due to abnormal resistance of the arterial wall, known as arterial tonus. This cause can be readily determined by keeping up the cuff pressure on the brachial for a few minutes before a second systolic reading is taken. When the hypertension is due to hypertonus, the second reading will be within normal limits and will represent the actual blood pressure of the individual. The second systolic reading is sometimes fifteen to thirty millimetres lower than the first.

SIGNS SIMULATING CARDIOVASCULAR DISEASE.

We now come to the larger and more important group of applicants, viz., those with physical or clinical signs simulating actual cardiovascular disease. For purposes of classification, this may be studied from the standpoints of: 1, size of the heart; 2, abnormal cardiac rhythm; 3, abnormal cardiac sounds, and, 4, dyspnea.

Size of the heart.—In another connection (1), I have indicated the common sources of error inherent in percussion methods which attempt to delimit with any exactness the cardiac area. Frank and gross enlargements can be readily diagnosed, but their importance lies in the category of those with definite lesions. I consider it of minor importance in those with equivocal physical signs to be able to map out the size of the heart, for there are many factors which produce considerable variations even within normal limits. The broad and deep chested are apt to have larger hearts than the small and narrow chested. The tall and gaunt have, as a rule, narrow, graceful, and pendulous hearts. The fat and stocky are apt to have hearts which tend to occupy horizontal positions in the chest. In all these types of individuals, we find numerous exceptions. I have, for example, often been surprised to find upon fluoroscopic examination that thin and narrow chested individuals possessed large, though normal, hearts. Fluoroscopy will also confirm the fact that the actual apex is often several centimetres below the point of the maximal apical impulse. To these variations as found in quiet, normally beating hearts, I may further state that hearts beating vigorously and rapidly usually give the impression of enlargement, while x ray examination often reveals them to be of normal contour and size. These brief considerations show the difficulty of standardizing the size of the heart and of mapping out its size and contour by percussion. However, while for other purposes such exact knowledge may be of interest and importance, it possesses slight and subsidiary value in the examination of recruits with hearts simulating actual disease.

Abnormal cardiac rhythm.—The great majority of cases in this group are those with simple pulse acceleration, usually due to the incidental emotional excitement of the examination. The usual rates are in the neighborhood of 100 a minute. Sinus arrhythmia, i. e., an alternate slowing and acceleration of the cardiac pulse rate in consonance with inspiration and expiration, is less frequent than simple tachycardia. A combination of a slow and rather rapid heart action with sudden transition from one to the other, each phase lasting approximately four to eight beats, is not unusual. Occasionally premature contractions, or extrasystoles, are encountered. These are improperly called missed or skipped beats, for in almost every instance the beat missed at the wrist can be heard as a faint ventricular systole. Tachycardias of paroxysmal nature, i. e., sudden attacks of extremely rapid cardiac acceleration, with ventricular rates between 150 and 200, lasting several seconds or minutes, are occasionally found in the draft candidates. All of these cardiac irregularities are readily diagnosable by the ordinary clinical methods. Of even more importance than their diagnosis is the fact that none of these irregularities are in themselves indicative of, nor do they form any basis for, the diagnosis of heart disease. As often as not, they are of purely functional, extracardiac origin. Other concomitant signs or symptoms are necessary before the candidate can be classified as having cardiac disease. A persistent tachycardia, however, may produce sufficient subjective annoyance and objec-

tive dyspnea upon exertion to unfit the candidate for the duties of the soldier. Such men, to be finally rejected, should present this symptom while under observation for at least one half hour, the rates should be 120 or over, the tachycardia should be accompanied by unmistakable evidences of dyspnea, and the same pulse acceleration should again be present at some future examination.

Abnormal cardiac sounds.—I refer here to those murmurs, reduplicated, or so called gallop and double rhythm, and other adventitious sounds heard over the normal heart. All these may be conveniently grouped as occurring over the right base, over the left base, or over the apical region. Over the right base are heard soft, whifflike systolic murmurs usually accompanying, not replacing, the normal first sound. They commonly occupy the whole systolic period. They are rarely transmitted to the carotids, although undue pressure with the stethoscope upon these vessels may give that mistaken impression. Unless the definite signs of an aortic stenotic lesion are present, the murmur just described is not significant of actual disease.

Over the left base are found chiefly the so called cardiorespiratory murmurs. These have a superficial character, may be quite loud, and are usually systolic, though occasionally both systolic and diastolic in time. The murmur is sometimes transmitted to the midprecordium or even lower. Its intensity usually varies with the position of the patient and with the phase of respiration. It is ordinarily least intense and indeed may be found to disappear entirely if auscultation is practised at the end of deep inspiration. Even if loud, these left basal murmurs do not in themselves indicate cardiac disease. They are to be differentiated particularly from the friction sounds of a localized pleuropneumonitis in this area and also from patent ductus arteriosus and pulmonary stenosis. The latter cardiac lesions, besides murmurs, give other definite symptoms and signs of their presence. Different from murmurs over the left base, are the reduplicated sounds usually called gallop or double rhythm; they are characterized by a sharp double valvular click, as if there were a double closure of the pulmonary valves. These sounds also are not indicative of cardiac disease.

A study of apical adventitious sounds is of great practical importance because these are most apt to be confused with actual mitral disease. Most of these sounds consist of soft blowing murmurs, accompanying, but not replacing, the first sound, and only slightly transmitted to the right and left of the apex. It has been asserted that they are even transmitted posteriorly. I have not yet been able to corroborate this statement. These murmurs are occasionally loud; indeed, they may be as loud as some organic mitral murmurs. They usually vary with the position of the patient, and are sometimes capricious in that they are present at some examinations and not at others. In addition to these adventitious apical murmurs are other abnormal sounds, scarcely mentioned in the literature, which I consider of great importance. I can best describe them as thrill-like first sounds. They are systolic in time and are usually confined to the apex. They are commonly found in tachycardias, or even with a normal rate

if the cardiac impulse is exceptionally vigorous. If the tachycardia disappears spontaneously, or the heart rate or overaction can be quieted by having the applicant take and hold a deep breath, this thrill-like first sound often disappears. Besides other characteristics distinguishing it from the typical presystolic rumble of true mitral stenosis, this thrill-like adventitious sound is not accompanied by the double click valvular second sound so common in stenosis.

Dyspnea.—The dyspnea accompanying actual decompensation requires no comment here. I wish to refer only to the two types occasionally seen among the draft candidates. First, when found in tachycardia, the rapid heart action is the cause of the dyspnea, the possible rejection of candidates should be based upon the observation of the tachycardia along the lines already discussed, and not upon the dyspnea. The second type of dyspnea is that accompanying the subjective feeling of palpitation, with a perfectly normal, or even somewhat slow, heart rate. It is found more often in civil practice among neurotic individuals than among draft candidates, it is sufficiently frequent to deserve mention. It is not accompanied by any evidence of decompensation and is not appreciably increased by even sustained effort. It is a symptom which may, of course, be simulated by the candidate, but is not a sign of cardiac disease and hence does not excuse the candidate from service.

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MEDICAL NEWS FROM WASHINGTON.

Medical and Dental Students may be Commissioned in either War or Navy Departments. Work on Hospital Accommodations for Returned Wounded.—Responsibility for Venereal Diseases in Camps Not Wholly up to Military Authorities.—Work of the Naval Medical School.

WASHINGTON, February 25, 1918.

Arrangements have been made between the war and navy departments to extend to enrolled medical and dental students the privilege of accepting commissions in either branch of the service. Thus the privilege applies to both the army and navy; that is, for example, an enrolled medical student of the naval reserve force may accept a commission in the Medical Reserve Corps of the army, and vice versa. However, to be relieved of his obligation as an enrolled enlisted man, a student must accept active duty, for no enrolled student will be disenrolled in order to accept a commission in the inactive reserve. The operations of the selective draft law had the effect of greatly increasing the number of enrollments of medical and dental students, particularly in the naval reserve force. These men will be permitted to pursue their courses of instruction until they graduate, when they probably will be called to active duty and instruction in hospitals and at training stations. It is not now expected that undergraduates will be assigned to active duty during their vacation periods.

* * * * *

Plans are being worked out carefully and thoroughly by the army Medical Department for the care of the wounded and sick American troops

brought home from France. Based on figures from England and Canada, it is estimated that it will be necessary to have in the United States from five to ten per cent. bed capacity for the troops serving abroad, the number of required beds gradually increasing because many cases will be kept a long time under treatment. The scheme as so far worked out contemplates the construction of a clearing hospital of 1,500 beds on Staten Island, which is authorized and under construction, and the establishment of special hospitals, general hospitals, and convalescent hospitals and camps.

The special hospitals proposed are three or four for tuberculosis patients, one of which is already under construction at Otisville, N. Y., another of which will be on ground already leased at Asheville, N. C., and another for which the existing hospitals of the army at Fort Bayard, N. Mex., will be enlarged. A site also has been selected for an additional tuberculosis hospital in Colorado, and a site for a similar hospital in Connecticut has been offered for lease. The army and navy general hospital at Hot Springs, Ark., is being enlarged, and it is proposed to use hospitals in Baltimore for treatment of the blind and deaf. A hospital for mental cases has been started at Fort Porter, N. Y. A war neurosis hospital and an epileptic hospital also will be necessary. Another matter that sooner or later will have to be taken up by the medical authorities of the army is the establishment of one or more institutions for the unrecognized, similar to those establishments that have been maintained in England and France for the care of those whose facial characteristics have been obliterated beyond recognition.

* * * * *

There seems to have been a general impression, particularly among laymen, that illicit sexual intercourse and venereal diseases are more common in the military forces of the United States than in civil life. That this is an erroneous conclusion is well known to most medical practitioners of the country, and one resulting principally from the fact that the statistics of these diseases are collected by the surgeon general of the army and frankly published, whereas the corresponding figures for civil life are incomplete and inaccessible. Recent legislation giving the Secretary of War and the military commanders authority to control, not only, as heretofore, the military reservations and cantonments, but also the civil communities immediately adjacent, in all matters relating to prostitution and the sale of alcoholic drinks, already is doing much to bring about the desirable conditions long sought for by the army sanitarian. The regulations established by the Secretary of War prohibit the presence of prostitutes within five miles of any military camp, cantonment, or post. Venereal diseases never have had their origin in military reservations, where strict discipline and constant inspections have rendered it impossible, but rather in the laxly governed civil communities surrounding many army posts, where ignorance of conditions and indifference, or something even worse, on the part of local authorities, have conducted widespread infection, not only of the civil population, but the

soldiery as well. Special measures for protection against this class of infectious diseases were formulated six years ago, since which time, so far as lies within the power of the Medical Department, they have been carried out rigorously and conscientiously, and it is believed that in the great majority of instances there has been no laxity in the strict enforcement of the regulations by others in military authority. However, the prime source of infection in venereal diseases lies not within military jurisdiction and control, but in civil life, quite apart from the immediate garrison life of the soldier and the rigid supervision incident thereto.

* * * * *

The navy Medical Department is playing an important part in working out the conception that the navy is a great educational institution in which its members not only store their minds with valuable knowledge, but also acquire habits, modes of thought, and principles of conduct that make for success throughout life, whether in the service or in civil occupations. The naval medical school gives the newly appointed medical officer a technical course designed to supplement his previous educational opportunities along lines peculiar to naval and military duties. The medical correspondence school aims to reach members of the reserve corps unable to attend the sessions of the medical school in Washington and to render them familiar with special forms of procedure and special methods necessary to the practice of medicine in Government service. It has been impossible to train all of the recent acquisitions to the corps at the school, and for this reason provisions have been made for their training by men of eminence, in most cases members of the Medical Reserve Corps, in large medical centres.

The special training schools for members of the hospital corps have greater significance, relatively speaking, since, in the majority of cases, the members of this corps enter the service without previous knowledge or experience of their specific duties. In addition to the training schools already in existence at Newport, R. I., and San Francisco, a school has been opened at the naval training station at Great Lakes, Ill., and one at Norfolk, Va. In former years the instruction given to each class at the naval medical school has extended over a period of from six to seven months. The purpose of the instruction was to refresh the memory on the principal branches of medicine of such members as had come to the service after one or more years of private practice or who had served in hospitals where the work of any given intern was exclusively surgical or medical; to give specific instruction on subjects such as tropical medicine, sanitation, etc., not always covered in the ordinary curriculum, but of immense importance in the naval service; to give practical illustration of the limitations, modifications, or facilities in the practice of medicine and surgery imposed by service conditions; to acquaint in some measure the practitioners fresh from civil life with the military features of their chosen career, and to impart or review a standard requirement of familiarity with details of laboratory technic.

Editorial Notes and Comments

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BEHIND THE ENEMY'S LINES.

The trench line forms the point of concentration for the conduct of the war. It by no means, however, represents all of the allied nations' task, nor even perhaps the largest part. Behind this fighting line is a vast area of preparation and activity which is being constantly widened and will be far more extended here in our own country when the backward surge of the crippled and maimed shall be fully upon us. The activity and the efficiency which are found in these furthest reaches behind the enemy's lines call for consideration. They should incite to more earnest effort and more thorough deliberation as to the ways and means for meeting the enemy upon the plane of their effectiveness, if we will win the cause of a free and equal opportunity for all men, to which we are pledged.

The *Journal of the American Medical Association*, February 9, 1918, contains a full abstract of a report made by President Sjögren, of the Swedish Medical Association, of his recent observations in Germany upon the efforts of that country to "uncripple the war cripples." The efficiency of the empire's endeavor is due in part to

the element of authority that prevails, but even more to the natural and reasonable principles upon which the work is based. While the work has been well planned and organized, there is no formal centralization of it, and yet there is uniformity in the principles upon which it is carried out, and military authority supplies the necessary organization and the initial incentive. This is supported by the more lasting and effective impulse and desire, which it is the endeavor to rouse in every man to make the best of what remains of his physical equipment, train, and educate it to take up again its natural functions, and adapt it to useful and satisfactory occupation. This in turn the empire seeks where necessary to provide.

Stimulation and development of function through use is evidently the most substantial principle applied. In the Brandenburg district, which was the region particularly visited by President Sjögren, he found the cripples receiving not passive orthopedic treatment, favoring the wounded limbs and creating and fostering a natural inclination to dependence of the injured part or of the whole individual upon supportive treatment and care, but the wounded in an early stage of healing were undergoing active gymnastic treatment, so that by the shortest and most natural route the injured parts might be returned to the greatest measure of efficiency still possible to them, and that the whole body should join in this restoration as far as possible to a normal state of activity. Military discipline at first made this possible, but the wounded soon came to acknowledge the benefit derived from this form of treatment. Good will and a spirit of emulation appeared as results, to become further assets toward full success.

The subject of choice of occupation for those to be restored to usefulness is no less thoroughly handled. Former skill and training is carefully considered, the subject is aroused from listlessness and apathy, the fear of losing his pension is removed by the learning of a trade, and special occupations are chosen and found for those with special defects such as blindness. This occupation training is of course a part of the actual therapeutic exercise from the first, and thus the men are not only supplied with extra incentive but are protected from a long and harmful period of idleness. The services of the workshops are utilized for the making and repairing of articles needed for war and also for the devising and making of

all sorts of artificial limbs and other appliances for cripples. Convalescents, particularly medical students, are also encouraged and aided to resume their studies at the universities and colleges while unfit for service.

An inclination to rural life and also former experience in farming are taken into account, and the establishment of the pensioned soldier upon land where he can make his own home is also the state's care. This feature should particularly recommend itself in our country, where we should not be hampered like Germany with overcrowding and lack of land resource. A study of this report is well worth careful perusal by all those upon whom devolves even now the planning and preparation for the task soon to be brought home in all its force to our nation.

THE DRIVE AGAINST QUACKERY IN ONTARIO.

About three years ago the Ontario Government appointed Mr. Justice Hodgins a commissioner to inquire into medical education and practice in that province, to look into the conduct of the College of Physicians and Surgeons, its relations to the universities, the state of medical education, the various cults doing business as usual, the nursing profession, and the dental profession. It was a large order, but it was gone into in a businesslike and detailed way, and every one interested had ample opportunity to place his case before the commissioner, even to the osteopaths, the chiropractors, and the Christian scientists. The result is a rather bulky report which has been submitted to the Ontario legislature now in session.

Mr. Justice Hodgins has come to the conclusion that the medical profession "are not willing to look things in the face for fear that they may see something. At all events, their attitude is, and has been, that of knowing nothing and wanting to know nothing about these cults," meaning, of course, the osteopaths, chiropractors, and Christian scientists; and goes on to say: "I am glad to say they do not, in my judgment, properly represent the more advanced and open minded of the profession." We had always thought that the medical profession on this continent were a little too eager in taking up new remedies and new means of cure, and, bearing that stricture in mind, it is interesting to examine the recommendations and pronouncements upon each in turn.

The medical profession never saw any good in the chiropractors; neither could the osteopaths. What does Mr. Justice Hodgins say? He cannot accept as part of the recognized profession a

system which denies the need of diagnosis—did we?—a system which refers ninety-five per cent. of diseases to one and the same cause, and turns its back upon all modern medical and scientific methods as unworthy even to be discussed. This is the handwriting on the wall for them. While not always denying some good in osteopathy, the medical profession always held that if its practitioners were to practise the healing art in that form, they should come into the game by the same route as the regular practitioner. Mr. Justice Hodgins recommends that osteopaths, chiropractors, and other drugless healers, practising in Ontario up to June 30, 1913—about the time Sir James Whitney intimated a commission was to issue—are to be permitted to continue for six months from January 1, 1918, without being subject to any disability or prosecution. He further says that no one should be permitted after July 1, 1918, to practise medicine, as defined in the province—and it should be defined—without a license from the College of Physicians and Surgeons, excepting those practising osteopathy on June 30, 1913, holding a certificate from one of the five colleges recognized by the American Osteopathic Association, having had five years practice in osteopathy, and having obtained a certificate from the association that they are qualified to pass an examination for license in the State with the highest standard. These may continue in practice under a special license from the minister of education.

The medical profession never had anything to do with Christian science as a religion. How is it to be regulated? A clause should make it clear that there is nothing in the legislation to prevent the practice of the religious tenets of any church, but any person exercising any religion for gain for the benefit of the sick or diseased shall be required to possess a permit from the Provincial Board of Health of Ontario, certifying that the holder is required to be reported under the Public Health Act. As Christian science treatments have the effect of eliminating the regular practitioner, the interests of public health demand that such persons should be held responsible for mistakes in the nature of disease; that they should therefore conform to the present and future health regulations; that when they act for gain they should possess sufficient medical knowledge to recognize those diseases pronounced by health authorities as communicable. The commissioner recommends heavy penalties upon any persons controverting the new act in that respect. They should be carefully restricted to the *bona fide* tenets of their religion.

They should have no other right or immunity than that enjoyed by any minister of any other religious denomination. Optometry is to be taught by the faculty of medicine of the University of Toronto, the courses to be arranged by the faculty, the Optometrical Association, and the Toronto Technical School. It will be only on a student's passing that course that he will be entitled to style himself an optometrist.

Not the least of the commissioner's recommendations is that physical therapy shall be thoroughly taught in connection with the hospitals and universities, and that staffs be selected from those having special training along these lines, particularly those trained in war work. He further recommends that a medical director be appointed for the province in order that the interests of the public shall be safeguarded; that independent examinations be continued to be conducted by the College of Physicians and Surgeons and the universities of the province until the universities are prepared to hand over part of the degree conferring powers to the college; that the Royal College of Dental Surgeons turn over its surplus students to the University, the latter to provide increased facilities for training students; and that trained nurses have recognition, with the establishment of local branches for registration.

The homeopathic representation on the medical council of the province has always been in Ontario a bone of contention, five representatives speaking for about thirty practitioners in the province, while the regular profession had sixteen representatives to speak for 2,500 to 3,000. Doctor Hodgins says it is apparent that the followers of homeopathy are fewer now than formerly, and believes it is wrong that the whole medical council of the College of Physicians and Surgeons is responsible for all matters pertaining to the regular profession, and that three out of five homeopaths on the council name the colleges where medical training may be had.

REMOVING THE MISFITS FROM THE MEDICAL DEPARTMENT.

The announcement that more than 1,000 officers of the Medical Reserve Corps have been discharged from the army service and that discharges are proceeding at the rate of fifty a week will come as a surprise to the medical profession as well as to the public. Up to last Saturday 411 members of the corps had been discharged for physical disability, 154 for inaptitude for the service, 306 to join other branches of the service, fifty-nine for

domestic difficulties, thirty-two because they were needed by communities, hospitals, schools, etc., and eighty-eight had resigned. During the same period 4,000 applications had been rejected and 21,740 had been accepted and recommended for commission in the Medical Reserve Corps.

On February 23d there were on active duty 768 officers of the regular army Medical Corps, 1,207 officers of the Medical Corps of the National Guard, thirty-two officers of the Medical Corps of the National Army, and 13,687 officers of the Medical Reserve Corps, making a total of 15,694. At the outbreak of the war 490 regular officers and 297 reserve officers were on duty. In building up a corps of such vast proportions on so slender a foundation and in such a brief time, it was inevitable that some errors of judgment must have been made. That the Surgeon General has set about the rectification of these errors through a careful study of the records of the officers on duty and their reexamination proves that General Gorgas does not propose to be satisfied with anything less than the best the country affords for the Medical Department. While discharge from the service may seem a hardship in individual cases, the department is fortunate in having at its head a man whose regard for the welfare of the service is superior to his regard for the feelings of individuals. It is only by the application of rigid discipline that the Medical Department can be brought to its highest stage of efficiency and whether incompetency arises from physical, mental, professional, or temperamental causes, it is most important that the unfit should be dropped at the earliest possible moment.

Fortunately but few cases have arisen in which the lack of fitness of the medical reserve officers has led to serious results. In these few cases court-martials have been held and suitable punishment has been meted out. This record of discharges from the service is one of the best answers which could have been made to the recent criticism of the Judge Advocate General of the attitude of the medical officers toward each other when one of them was under trial. In this case the Judge Advocate General said: "Notwithstanding these facts every member of the Medical Corps called to testify in the case sought by theory and inference to excuse and justify the action and conduct of Lieutenant Dwyer. The morale of the men in the ranks must to a measurable degree at least depend upon their confidence in the disposition and competency of the Medical Corps to give them adequate care and treatment when sick or wounded; and it is difficult to conceive how that confidence could be more effectually undermined and shaken than by

the members of that corps seeking to prove that the conduct of Lieutenant Dwyer in the case of Private Gherring measured up to their conception of the standard of care and skill that men in the ranks may reasonably expect at their hands."

This is a very serious charge from an important source. One can well understand that the medical reserve officers not familiar with the details of military duty might err on the side of rigidity of discipline in view of the numerous warnings which they have received regarding malingering. This seems to have been the basis of the error in this case and the sympathy with this view is what called out the severe criticism of the Judge Advocate. The action of the Surgeon General, however, in applying to the officers of the Medical Department the most rigid discipline and requiring from them the utmost efficiency shows conclusively that the general charge against the department made by the Judge Advocate General is groundless. No organization which has grown so rapidly as this could be devoid of faults or free from misfits. The energetic action of the Surgeon General shows that these faults are being remedied as soon as they are discovered and that these misfits are being promptly removed.

A SUGGESTION FOR THE TREATMENT OF IMPETIGO.

One of the fundamental differences between civil and military practice is that frequently in civil practice, while cure is desired and should not be delayed unreasonably, still the time element does not enter so largely into a problem as it does in military practice. If a civilian feels that he is improving and that the treatment is doing him good he is usually not particularly anxious that the cure should be hurried unduly unless indeed there is some special reason for speedy cure, such as marriage or a journey. It is highly important, however, that the sick soldier should be returned to the front as quickly as possible. Everything else must be subordinated to this. If in an army of 5,000,000 men the average yearly time lost by illness is twelve days, and if by improved methods of treatment this time can be reduced to ten days, this is equivalent to keeping an army of 27,396 men constantly on the firing line. If the average time of disability in the example can be cut in half, it would be equivalent to keeping an army of nearly 100,000 men at the front. Now, 100,000 men, or 50,000, or even 30,000, might easily turn the tide of battle at a critical time.

Skin diseases, the British army surgeons report, disable a man affected for an average of

thirty-one days. Impetigo is frequent and annoying, and is difficult to treat. We are familiar with the various treatments, some more or less satisfactory according to the textbooks and yet disappointing in actual practice. Most commonly, perhaps, we adhere to the simple formula of removing the crusts and treating the lesions with an ointment such as ammoniated mercury. Acting on the theory that impetigo is a superficial or intracellular infection, probably due to a strain of streptococci, why not try out the treatments which at the present time are giving the most satisfactory results with infection, namely, the Carrel-Dakin and the dichloramine-T. Let us select a number of typical cases of impetigo contagiosa, say thirty, treat ten by ammoniated mercury ointment, omit treatment in ten entirely, and treat ten by the Carrel-Dakin method, with all its minutiae. This is offered frankly and originally as an experiment, justified, it would seem, theoretically at least, by our conception of this disease as primarily a superficial infection. Impetigo is not only a painful and disabling skin disease, but a soldier suffering from it is liable to chagrin on account of the fact that many of his comrades will mistake his trouble for syphilis and he will surely be subjected at the least to chaffing and at the worst to boycotting.

ESPECIALLY A MEDICAL OFFICER.

In the *Naval Digest* for 1916, which contains a digest of orders and regulations promulgated by the Secretary of the Navy, of laws enacted by congress affecting the service, and of important decisions and opinions of the judge advocate general of the navy, the following comment by the Judge Advocate occurs: "Every naval officer, and especially a medical officer, whose use of intoxicants is carried to such an extent that his superiors cause him to be tried and who is convicted of drunkenness on duty should be sentenced to dismissal from the navy and such sentence should be inexorably carried into execution. Whatever charity or assistance may be extended to such officers should be given when they have reached some other walk in life than the naval service. They are worthless members of their profession and should in every case be forced off the list of officers of the navy." The distinction afforded by the phrase "and especially a medical officer" is welcomed by the editor of the *Naval Medical Bulletin* (Vol. xii, No. 1) as evidence of the fact that whatever becomes an officer and a gentleman should be the peculiar attribute of the medical officer, and that whatever is not in harmony with the most exemplary behavior will indeed be most conspicuously bad in a physician. Fortunate, indeed, is that service which cherishes such lofty ideals for its members and to the credit of the Medical Corps of the navy it can be truly said that its members live up to them.

News Items.

Four New Army Hospitals for Tuberculosis.—It is announced that hospitals for the treatment of tuberculous soldiers are to be erected at Whipple Barracks, Prescott, Ariz.; Asheville, N. C.; New Haven, Conn., and Denver, Colo. They will cost about \$550,000 each.

Health Conditions in France.—At a meeting to be held in the New York Academy of Medicine, under the auspices of the Public Health Committee, Wednesday evening, March 13th, Dr. James Alexander Miller, who recently returned from France, will deliver a lecture on Health Conditions in France and America's Efforts to Aid Them, which will be illustrated with lantern slides.

United States General War Hospital No. 1 Opens New Wards.—A new section has been opened at this hospital for service containing eighteen new wards, practically doubling the original hospital accommodations. About a thousand patients may now be cared for at one time. Colonel Edward R. Schreiner has been succeeded by Major William H. Bishop as chief surgeon and commander of the hospital staff.

Meetings of Medical Societies to Be Held in Philadelphia during the Coming Week.—Monday, March 4th, Academy of Surgery, Blockley Medical Society, Clinical Association, Wills Hospital Ophthalmic Society; Tuesday, March 5th, Laryngological Society; Wednesday, March 6th, Academy of Stomatology, College of Physicians; Thursday, March 7th, Obstetrical Society; Friday, March 8th, Atlantic County Medical Society; Northern Medical Association, Physicians' Motor Club (directors).

Personal.—Dr. Victor C. Vaughan has been promoted to the grade of lieutenant colonel, Medical Reserve Corps, National Army.

Major Alexis M. Forster, Medical Reserve Corps, has been ordered to command the United States Army General Hospital to be established in New Haven, Conn.

Dr. Leo Buerger has been appointed professor of genitourinary diseases in the New York Polyclinic Medical School and Hospital, to occupy the chair of urology, recently made vacant by the resignation of its previous incumbent.

Harlem Medical Association.—At a stated meeting of the association to be held at 82 West 126th Street, Wednesday evening, March 6th, the following programme will be presented: A Report of Three Cases of Tuberculosis, by Dr. Henry L. Shively; Serology of Tuberculosis, by Dr. Hyman Rudolph Miller; Prognosis in Tuberculosis, by Dr. Maurice Fishberg; Personal Experiences of Tuberculosis in France, by Dr. James Alexander Miller, with lantern slide illustrations of present day conditions; Tuberculosis and the War, by Dr. Hermann M. Biggs. There will be general discussion, which will be opened by Dr. Alfred Meyer, Dr. Gerald B. Webb, and Dr. Max Teschman.

Prevalence of Tuberculosis in the United States.—According to the latest estimate of the National Association for the Study and Prevention of Tuberculosis, based on a revised conception of the prevalence of the disease as the result largely of the examination of recruits and drafted men for the new army and navy, there are probably between two and three million active cases of tuberculosis in the United States. In the military medical examinations so far, an average of about two per cent. of the men of draft age in the country at large were found to be tuberculous. There are 43,000 beds available for tuberculosis in the United States at present, and 50,000 more hospital beds are needed to cope with the problem.

Medical Officers Face Court Martial Because of Soldier's Death.—News despatches from Washington, dated February 23d, state that Lieutenant Colonel J. H. Allen, Medical Reserve Corps, and Major Milton Beard, Medical Corps, officers at Camp Zachary Taylor, near Louisville, Ky., have been ordered by the War Department to appear before a court martial for trial in connection with the death of Private Otho Murray, a selectman from Cumberland County, Kentucky. Murray, it was said, was ordered back into training before he had fully recovered from an attack of measles. The case against Lieutenant Colonel Allen is understood to be based on the technicality that as the superior officer he is responsible for the acts of his subordinates.

Meningitis Carriers at Camp Merritt.—Fourteen men, said to be meningitis carriers, were taken from Camp Merritt, Tenafly, N. J., to Base Hospital No. 1, the Bronx, for treatment. It is said that there are now about 750 patients in this hospital, about forty per cent. of them suffering from tuberculosis.

Ellis Island War Hospital.—Plans for converting Ellis Island into a great army and navy hospital for the period of the war provide for the care of 7,000 soldiers and between 3,000 and 5,000 sailors. There are several reasons for the selection of Ellis Island by the Government for a temporary war hospital, the principal one being that the present amount of immigration is not sufficient to require the large plant used before the war.

Naval Surgeons in Charge on Transports.—Under an agreement which has been entered into by the War and Navy departments, sick and wounded on transports from France will be under the care of the navy hospital organization. There has been some doubt in the minds of the department heads here just where this responsibility rested, but since the navy has taken charge of the transports, it has been decided that it was advisable to place the hospital arrangements on these ships under its control. As soon as the convalescents are received in this country the army will care for its own in the many hospitals that are being prepared.

Carnegie Foundation Gives \$1,000,000 to McGill University.—The Carnegie Foundation has presented to McGill University, Montreal, \$1,000,000 in recognition of the institution's "devoted service and sacrifice toward Canada's part in the war." A letter accompanying the notification refers to the award as an expression of appreciation and sympathy for the people of Canada on the part of their allies south of the border. The work of McGill which has earned this tribute includes the maintenance of an officers' training corps, through which the university has contributed more than 2,000 of its own men for overseas service and trained 10,000. Of these, 236 McGill students have given their lives. McGill has also raised and equipped two batteries of siege artillery and maintained a general hospital in France with more than 2,000 beds.

Many Surgeons Dropped from the Army.—Washington despatches dated February 26th state that in line with its reorganization on a greater efficiency basis the Surgeon General of the Army has released from service 1,050 medical officers. The discharges are classified as follows: Physical disability, 411; inaptitude for the service, 154; to join other branches of service, 306; domestic difficulties, 50; resignation, 88; needed by communities, hospitals, schools, etc., 32; total, 1,050. During the same period there have been 2,265 promotions of medical reserve officers, including some officers promoted more than once. The discharges are in addition to about 4,000 rejections of applicants, 21,740 having been accepted and recommended to the Adjutant General's office for commissions, and of these 13,687 were on active duty on February 23d. The Surgeon General is determined to put the Medical Department on the highest plane possible by elimination of all who are unfit for actual service.

Meetings of Medical Societies to Be Held in New York during the Coming Week.—Monday, March 4th, Clinical Society of the New York Throat, Nose, and Lung Hospital, German Medical Society of the City of New York, Brooklyn Hospital Club, Clinical Society of the New York Polyclinic Medical School and Hospital, West Side Physicians' Economic League; Tuesday, March 5th, New York Academy of Medicine (Section in Dermatology), New York Neurological Society, Society of Alumni of Lebanon Hospital; Wednesday, March 6th, Brooklyn Society for Neurology, Society of Alumni of Bellevue Hospital, Harlem Medical Association, Bronx Medical Association, Psychiatric Society of New York, Society of Alumni of St. John's Hospital, Brooklyn, Long Island Society of Anesthetists; Thursday, March 7th, New York Academy of Medicine (stated meeting), Brooklyn Surgical Society, Physicians' Economic Society of New York; Friday, March 8th, New York Academy of Medicine (Section in Otolaryngology), Society of Externs of the German Hospital in Brooklyn (annual), Flatbush Medical Society, Eastern Medical Society of the City of New York, Clinical Society of the German Hospital and Dispensary, Manhattan Dermatological Society.

Modern Treatment and Preventive Medicine

A Compendium of Therapeutics and Prophylaxis, Original and Adapted

TREATMENT OF SLEEPLESSNESS.

BY LOUIS T. DE M. SAJOUS, B. S., M. D.,
Philadelphia.

(Continued from page 373.)

In considering the toxic forms of insomnia, stress was laid on the probability that direct or indirect effects of various toxic materials on the circulatory system were responsible, at least in part, for the difficulty in sleep induction, these effects so reacting upon the distribution of blood in the various portions of the body as to prevent the readjustment of blood flow to the brain which is believed physiologically to favor sleep. Such circulatory effects of toxic materials, it was implied, may supplement direct excitation of nervous tissue by these materials, or even in some instances entirely replace it, in the pathogenesis of insomnia. Caffeine was cited as a substance which, in addition to its well-known excitative action on the nerve centres, directly promoting sleeplessness, also exerts a combination of actions on the circulation calculated markedly to impede the oncoming of sleep.

Tobacco, with its alkaloid nicotine, is another agent frequently causing sleeplessness. The initial effect of nicotine on the brain is excitation, an effect ascribed in general to a direct irritating action of the alkaloid on the nervous tissues. This stimulation involves apparently the entire central nervous system, from above downward, being manifested also in the medullary centres and spinal cord. That nicotine actually does excite nerve cells directly is suggested by the experimental observation that when this alkaloid is applied to one portion of the cord, the resulting convulsions are limited to the motor structures innervated from this level (Sollmann); it is also shown by the well known effects of painting nicotine directly over nerve ganglia of the vegetative nervous system. Typical of the effects of nicotine is that the larger the amount experimentally administered, the less marked the initial stage of nervous stimulation and the more prompt and profound the secondary depression. With the smallest doses, corresponding to those taken into the system in smoking, the early stimulation of the brain centres thus probably persists longer than it does after larger experimental doses. Yet, apparently a secondary central depression cannot be excluded from consideration, even in relation to smoking. While the anxiousness and tremor met with in chronic tobacco intoxication may seem to suggest a continued irritation of the brain or spinal centres, the mental slowness and lack of energy, and the incoordination point rather to an interference with the cerebrospinal functions. Again, the species of pleasant psychical repose or detachment which accompanies the effects of tobacco in habituated subjects, independently of actual chronic intoxication, would seem, if anything, to favor the oncoming of sleep if no other factors were present to modify actual results. Such other factors, how-

ever, do exist in relation to the circulatory effects of the drug, which, like the nervous actions, are due almost exclusively to the contained nicotine.

Experimental work has shown that the initial effects of nicotine on the circulation include a distinct slowing of the heart, due to stimulation of the cardioinhibitory centre as well as of the vagus ganglia. Simultaneously there is marked stimulation of the vasomotor centre, as demonstrated by Pilcher and Sollmann, 1915, and also stimulation of the vasoconstrictor sympathetic ganglia, as shown by Hoskins and Ranson, 1915. These actions induce a more or less pronounced rise in blood pressure, which may, as suggested by the experimental labors of Cannon, Aub, and Binger, 1912, Jackson, 1913, and Gley, 1914, also be independently promoted by a discharge of epinephrin from the adrenals into the bloodstream. The stimulation of the vagus ganglia, slowing the heart, is soon followed by paralysis of these ganglia, as a result of which the heart action not only returns to its former rate, but regularly becomes accelerated beyond the normal, the stimulating action on the sympathetic, accelerator ganglia persisting longer than that on the vagus ganglia. In moderate smokers the blood pressure during smoking has actually been demonstrated to rise slightly and slowly; in novices, on the other hand, there is a sharp initial rise followed by a marked fall as the sympathetic ganglia become secondarily depressed and the peripheral vessels give way to marked dilatation. Smoking two medium cigars or eight to ten cigarettes was observed by John, 1913, to cause a rise in the diastolic blood pressure, which often remained high for two hours. Evidently, then, tobacco at times tends, somewhat like caffeine, to affect the general circulation in such a manner as to impede the oncoming of sleep, the blood pressure remaining for a considerable time more or less elevated above the normal and thus preventing, in part at least, the diminution of blood flow to the nervous centres which is believed to accompany sleep induction. According to Aliprandi and Fornaroli, 1905, the chewing of tobacco causes a constriction of the cerebral vessels. The fact is to be remembered, however, that often the local vascular effects of nicotine are only of short duration and that if, as John found, the diastolic pressure remains high for two hours after smoking, this pressure will probably still be high after the cerebral vasoconstriction has given way to secondary dilatation, thus causing in the brain, possibly after a period of somewhat reduced blood flow, a secondary period of markedly increased blood flow. This is in accord with Sollmann's statement that as a secondary result of the action of nicotine on the cerebral hemispheres in mammals, a violent headache, evidently due to the vascular dilatation, develops. Apparently the persistence of high general blood pressure after partial relaxation of the general vascular tree has already occurred is due to the continued

increase in the heart rate caused by nicotine. As shown in one of Sollmann's diagrams, the initial general vasoconstriction under nicotine disappears rapidly as one passes from small to moderate doses, while the heart rate continues high and the heart strength at least normal; the result of these actions is logically a persistent rise in blood pressure. Hence, in smoking, when an unusual degree of toxic action is exerted, a circulatory condition calculated to induce sleeplessness may probably be assumed to exist. If the toxic action is still greater, however, a tendency to collapse supervenes.

In the treatment of tobacco insomnia, complete withdrawal may seem a necessity, but as a matter of fact, reduction in the amount used is at times sufficient to bring relief. As Sir James Sawyer, 1912, points out, smokers often fail to sleep either sufficiently or soundly if they smoke more than their usual quantity of tobacco or use a stronger tobacco than that to which they have been accustomed. Pushed to undue limits, the stimulation of cerebral circulation caused by tobacco, as recognized by Sawyer, leads to cerebral vascular debility, "with a consequent tendency to persistent conscious thought, and so to wakefulness." In addition to the diminution or withdrawal of tobacco, brain sedatives such as chloral hydrate, or probable brain vasoconstrictors such as the coal tar analgesics, may be temporarily used. Frequently, however, the nonpharmaceutical measures previously mentioned—hydrotherapy, posture, etc.—will suffice as auxiliary procedures.

(To be continued.)

Treatment of Nerve, Muscle, and Joint Injuries in Soldiers by Physical Means.—R. Tait McKenzie (*Canadian Medical Association Journal*, December, 1917) says that the conditions to which physical therapy applies are as follows: 1. Injury to peripheral nerves, all the way from the bruising of a nerve trunk to its destruction and restoration by surgical means. These injuries are accompanied by weakness or paralysis, muscular wasting, and contractures. These conditions are met by the application of wet or dry heat to keep up the circulation; support in proper position by splints, to prevent the overstretching of weakened muscles and the resultant permanent contraction of those that are unimpaired; galvanic, and afterward faradic, stimulation of the affected muscles; massage to keep up and improve their nutrition, passive movement to prevent contraction and limitation of the normal range of the joints; progressive active movements, joint by joint, to bring back and strengthen voluntary power; and later, gymnastic and vocational training to fit the patient for his place in civil life. 2. Scar tissue. The bullet may leave a small entrance wound, but its course through the tissues may leave great areas in which muscle, fascia, tendon, nerve, periosteum, and skin are matted together in one confused, distorted mass, strangling the circulation and leaving the limb blue, clammy, moist, and painful to the touch. Such wounds are treated by the whirlpool bath, which in twenty minutes changes the cold purple of the painful hand into a warm crimson, and enables the masseur to stroke, knead and otherwise move

a joint in a way that no amount of persuasion would have made tolerable. Repair in these scars may be hastened by diathermy and ionization, and beginning contractures may be stretched by careful manipulation.

3. Old septic wounds, long healed, are frequently painful persistently, and a focus of infection may be found by massage. Often the stimulation of heat and massage hastens the extrusion of a sequestrum, or other foreign body, which would otherwise have remained a source of trouble for months. Such cases need most careful supervision. 4. In all postoperative conditions the cure must be completed by physical means. It is not enough to break down an adhesion or restore a joint to potential usefulness; its nutrition must be improved, and the patient taught to use it. He needs to be reeducated, beginning with free simple movements and advancing to those that are harder and more complex. 5. Functional neuroses, in the form of palsies, contractures, loss of sight, speech, or hearing, areas of anesthesia or hyperesthesia, show many cures by physical means. Contractures are slowly stretched and kept in place by splints, systematically massaged and exercised by the faradic battery where voluntary movement cannot be obtained, and brought back to usefulness by a combination of hypnotism, suggestion, encouragement, and the gradual replacement of them by voluntary movement. The mental is even more important than the physical treatment in these cases and must be continued intelligently sometimes over long periods of time.

6. The conditions grouped under the name shell shock, which vary from minute hemorrhages in the brain, caused by concussion, to fear and intolerable weariness, must be treated. When a soldier in the trenches begins to move his head rhythmically, twitch his arm, or clutch at the sound of a shell, the wise regimental surgeon sends him back to the rest camp for a week or two. If he is kept until the inevitable smash comes, his recovery will be a matter of months, and usually he is put out of commission permanently. Tremors, coarse and fine up to a general convulsion, rhythmic movements, increasing when the man is spoken to and calming down when he is left alone, are characteristic. Such men usually present a history of nervousness, frequently have enlarged thyroid, rapid pulse, and prominent eyes; all such cases call for rest and sedative treatment. Continuous bath at skin temperature, hours of rest in bed daily, and the substitution of gentle massage and electricity for active movement at first, with a gradual increase of exercise, beginning with a slow walk and ending with gymnastic games and vocational training. 7. The soldier's heart is but a symptom of overstrain. The faradic or high frequency current, the sedative bath, gentle massage, and rest quickly reduce the rapid pulse rate and allow him to bear without danger an increasing load in the form of gymnastic exercise, walking and manual labor.

8. Debilities, whether due to thyroid, dysentery, or exhaustion, are built up again and made ready for service by graded exercises of effort, like light gymnastics, and of endurance, like walking, until the patient can stand the amount of work to which

he was formerly accustomed. 9. The majority of the men who fill our war hospitals and convalescent homes must depend for their future efficiency on the masseur, the practitioner of electrotherapy and hydrotherapy, the physical instructor, and the teacher of vocational training. The course usually followed begins with preparation by heat, either wet or dry, or produced by electricity, on through the stimulation of nutrition by massage and passive movements, to simple voluntary exercise, and eventually to skilled movements by gymnastics, games, and handicrafts. Finally McKenzie urges the training of medical officers in these lines of work. The *Canadian Medical Association Journal*, commenting editorially on this paper, speaks of the remarkably successful results achieved by him in his work at Heaton Park, England, and mentions as one instance the fact that of 2,000 men who had been discharged from the service in 1916 as physically unfit, over one half have been sent back to the fighting line. The editor also states that about ten per cent. of the convalescent soldiers who pass through the hands of the Military Hospitals Commission require vocational reeducation.

Functional Capacity of the Heart.—T. B. Barringer, Jr. (*Archives of Internal Medicine*, December 1917) states that in a person with a normal heart, twenty to thirty seconds after physical work the systolic blood pressure and pulse rate are increased. When further readings are made fifty and ninety seconds after work, and later every sixty seconds, the pressure and pulse are found to return rapidly to the figures noted before the work. When the amount of work is progressively increased, a quantity is finally reached which is followed by a different type of blood pressure curve. The latter does not reach its greatest height within thirty seconds after the completion of work, but at a later period—fifty to ninety seconds, when the pulse rate has dropped back toward normal. The group of muscles employed in performing the work is immaterial as regards this delayed systolic rise, which regularly appears after a certain amount of work has been performed in a given time. Children are able to do much larger amounts of work in comparison with their weights than adults before a delayed rise ensues. The amount of work followed by a delayed rise varies but slightly from day to day in the same individual. Patients with cardiac insufficiency perform much less work than normal subjects before a delayed rise appears, the work accomplished by them being measured in hundreds of foot pounds as compared with thousands in normal subjects. Occasionally in cardiac cases the pressure after work is lower than before, then rising to or above the original figure. Patients with marked cardiac insufficiency, edema, dyspnea at rest, etc., are able to do no work at all which is not followed by a delayed rise or fall. As the general health of normal persons improves, or cardiac patients get better, the amount of work performed before a delayed rise increases. Digitalis in heart cases causes a marked though temporary increase in the work performed before a delayed rise. A delayed rise is taken to mean that the work has overtaken the heart's reserve power, and

may be considered an approximate index of this reserve power. The simplicity of the test places it within the reach of every practitioner; any kind of work is appropriate, e. g., stair climbing, walking, dipping exercises, or dumb bell work. The test affords much information as to the kind and amount of exercise a cardiac patient may take and the suitability of any particular occupation.

Vaccine Therapy in Prostatic Cases.—H. C. Bumpus (*Journal A. M. A.*, January 26, 1918) sought to test the value of the administration of colon bacillus vaccine in cases of prostatectomy and adopted the plan of giving the vaccine in all cases for a period of five months and then comparing the results with those of the previous five months during which the vaccine was not used. As the other factors in the treatment had been standardized these were constant for both series. The vaccine used was mixed, fresh, autogenous vaccine and the dose was fifty million given twice weekly and increased by multiples of fifty million up to a maximum of 500 million. The development of pyelonephritis, epididymitis, and other colon bacillus complications of prostatectomy was taken as the criterion of the influence of the vaccine. The results showed that the use of the vaccine did not influence the incidence of these complications, did not confer even a relative immunity, and had no influence on the postoperative course of the cases.

Causes of Death and Maternal Mortalities in Childbirth.—J. A. Harrar (*American Journal of Obstetrics*, January, 1918), referring to 101,197 actual confinements at or near term conducted by the New York Lying-In Hospital from 1890 to 1917, states that in the outdoor service among 69,081 confinements, there was a mortality of 0.31 per cent. On the indoor service of 23,130 regular applicants confined, 0.47 per cent. died. Among women admitted as emergency cases, who either had never submitted to ante partum examination or prenatal care, or who had been sent in by midwives or doctors after failure to deliver, five per cent. died. Puerperal infection led to more than twice as many deaths as any other single complication, causing 0.95 per 1,000 of deaths among the regular applicants confined indoor and 0.85 per 1,000 among the outdoor confinements. Of the deaths occurring among the post partum admissions and the emergency labors handled by a succession of midwives and doctors before admission, over one third were due to puerperal infection. Eclampsia, ranking second, caused 0.43 per 1,000 of deaths among indoor applicants and 0.37 per 1,000 in the outdoor service. The third cause of death was peritonitis after Cesarean section. Placenta prævia ranking fourth, caused 0.26 per 1,000 of deaths in indoor cases and 0.36 per 1,000 in outdoor cases while in the case of rupture of the uterus, ranking fifth, the corresponding figures were 0.26 and 0.28 per 1,000. Deaths from nephritis, broken cardiac compensation, pneumonia, shock and exhaustion from prolonged labor, and post partum hemorrhage ranked next, and after this, deaths from shock and hemorrhage after Cesarean section, tuberculosis, acute toxemia of pregnancy with convulsions, and accidental hemorrhage.

Emergency Treatment of Wounds of the Bladder and Urethra.—Chevassu and Escat (*Presse médicale*, December 13, 1917) assert that bladder wounds due to military arms are associated with great immediate danger, largely because of the peritoneal and intestinal lesions which frequently coexist. The ideal treatment of bladder wounds by suture of the wound openings is only exceptionally applicable, its results being often highly disappointing. Men with bladder wounds reaching the special hospitals belong chiefly to two classes; those on whom a cystotomy has been performed and those to whom no bladder treatment has been applied. An emergency cystotomy seems to be the best form of surgical treatment for bladder wounds. In the presence of a vesicointestinal fistula, formation of an iliac anus seems useless in the majority of cases, and its indications are very few. Patients on whom cystotomy has been performed should always be quickly transferred to the military urological hospitals, provided it is considered certain that no intestinal wound contraindicating early removal coexists. In wounds of the urethra, immediate suture, always tedious and difficult, should not be attempted unless a second route of evacuation for the urine, usually suprapubic, can be simultaneously established. Simple derivation of the urinary flow by a suprapubic cystotomy coupled with a free opening up of the focus of traumatism, is immediately sufficient in the majority of cases.

Application of the Carrel-Dakin Method to Civil Surgery.—G. A. Moore (*Boston Medical and Surgical Journal*, January 24, 1918) says that the results of this method of treatment may be grouped under two headings, a saving of men and a saving of money. Many limbs can be saved by it which formerly were amputated; septicemias and abscesses following wounds have been greatly reduced. From an economic standpoint the closure of wounds of soft parts and compound fractures, after infection has been subdued, and the resulting healing by primary union, is an enormous saving over older methods of treatment. The more rapid closing in of compound fractures effects a saving of from fifty to seventy per cent. in the cost, while it results in a better function of the limb and a greater probability that the patient will be able to earn his living after convalescence. In the Carrel-Dakin method of treating wounds we have a solution that is simple and easy to make and does not require a well equipped laboratory or a special knowledge of chemistry, and the ingredients of which are always available. In the hospitals and dressing stations where it has been used, it has proved that the inevitable sepsis following war wounds can be controlled; that many of the maiming operations which were done in the early months of the war to avoid sepsis were unnecessary; and that the mortality from sepsis can be greatly decreased as compared with older methods. As regards the use of this method in civil surgery the writer thinks that it would give as good results in killing domestic bugs as military bugs, and that its adoption in civil practice will be attended by results as gratifying as those obtained in the military hospitals.

Fluid Substitutes for Transfusion After Hemorrhage.—Peyton Rous and George W. Wilson (*Journal A. M. A.*, January 26, 1918) find that about three quarters of the total hemoglobin may safely be removed from animals and they will still survive provided that the blood fluid bulk is approximately retained. Great losses of blood plasma can also be tolerated with recovery, because the animal body has the power to replace the loss with great rapidity from its tissue fluids, if the bulk of the blood is maintained. Irrespective of the desirability of blood transfusion in other respects, it is not necessary to the saving of life in the majority of cases of acute hemorrhage if only the blood volume can be maintained by some means. Many fluids have been suggested for this purpose, but experiments and clinical trials have shown that almost all fall far short of maintaining the required blood volume for a sufficiently long time to permit the restoration of the plasma and the hemoglobin. The one which has proved most satisfactory is a solution of acacia of five to seven per cent. strength. This has the further advantages over most of the other suggested substitutes for blood in being nonprotein and hence devoid of the danger of causing serum sickness or protein intoxication, and of being readily sterilized by simple boiling.

Action of Tin Oxide and Metallic Tin on the Fever in Pulmonary Tuberculosis.—Arthur Compton (*Bulletin de l'Académie de médecine*, November 27, 1917), in view of the efficacy of a mixture of tin oxide and metallic tin, taken internally, in antagonizing staphylococcal infection in furunculosis, acne, chronic bone suppuration, traumatic osteomyelitis, and suppuration in war wounds, has been trying out the same remedy against the secondary infection of lung tuberculosis. The dose was one gram of the mixture a day. In the first case, diagnosed as tuberculous bronchopneumonia, sputum cultures showed staphylococci, Friedländer organisms, and two Gram negative bacilli. Tubercle bacilli were absent. In two days after the beginning of the treatment the temperature curve commenced to show a downward tendency, and on the seventeenth day the temperature dropped to normal, where it remained until the patient left the hospital to return to Australia. Two other cases, clearly of lung tuberculosis, are reported in which the treatment gradually brought down the temperature from around 39° C. to normal, the latter condition being reached on the twelfth and the twenty-third days, respectively. The sputum diminished in quantity and the general state was greatly improved. In the only patient under observation and treatment at the time of writing, improvement was still taking place nearly three months after the beginning of treatment. Cultures from the sputum after treatment still showed staphylococci, but the tin is believed to have reduced their virulence, just as it has been shown to prevent the production of acetic acid by the *Mycoderma aceti* from alcohol without interfering with the development of this organism. Similarly, vanadium and its salts have been shown actually to favor the development of the *Bacillus pyocyaneus* yet prevent pigment production by it.

Flatfoot.—H. V. Salis (*Correspondenz-Blatt für Schweizer Aerzte*, September 8, 1917) applies an adhesive plaster bandage over the front part of the foot and back of the toes, so as to force the middle metatarsal bones upward and hold them in the normal arch, after softening and removing the calluses from the foot. This is cut and laced along the dorsum of the foot, and also for a distance at the side near the ankle, so it can be removed easily. He says that mild cases of flatfoot can be cured by wearing this dressing some months, but in bad ones it has to be worn permanently.

Gonorrhea.—Lucius Felix Herz (*Medical Review of Reviews*, November, 1917) finds that the methods of treatment advocated by Bierhoff bring excellent results. They consist in irrigating the urethra with 1:300 protargol, anteriorly in anterior cases, posteriorly and retained until after a prostatic massage in posterior cases. Injections by the patient of 0.25 to 0.5 per cent. protargol are made with a hand syringe four times daily and retained ten minutes. The discharge diminishes appreciably in less than a week, and the average case is cured in from six to eight weeks. The case is not discharged as cured until irrigation with silver nitrate and drinking beer fail to produce a discharge, and an endoscopic examination is negative.

Gonorrhea in the Female.—Edward F. Ziegelman (*Medical Sentinel*, December, 1917) states that gonorrhea in women is one of the most difficult of diseases to cure, requiring unlimited perseverance and in many cases surgical skill and judgment on the part of the physician and the explicit confidence of the patient. A cure must be determined only on bacteriological and serological examination, not on amelioration of symptoms. He believes that in order to control this disease and obtain results it will be necessary that all infected women should be under civil jurisdiction, or subject to the same, and that, if necessary, public clinics with salaried attendants should be provided. It is useless to treat a female gonorrheic who persists in having intercourse with an infected man.

Chest Aspiration by Simple Siphonage Device. Joseph Felsen (*Journal A. M. A.*, January 19, 1918) suggests a simple arrangement of bottles for chest aspiration by siphonage. A large glass bottle is filled about two thirds full of water and is provided with a double perforated rubber stopper through which two glass tubes are passed. One of these reaches to the bottom of the bottle and is connected outside with a long rubber tube for siphonage. The other dips into the large bottle for only a short distance and is connected with a second smaller bottle by rubber tubing and a glass insert. The smaller bottle is also provided with a double perforated rubber stopper through which it is connected, on the one hand with the large bottle, on the other with a flexible rubber tube to which the aspiration needle is to be connected. With the connection to the needle clamped off the siphon is started. The needle is then inserted into the chest, the clamp removed and the fluid is drawn out by the siphon action of the fluid in the large bottle, first filling the small specimen bottle and then overflowing into the large bottle.

Work for the Aged.—Malford Thewlis (*Medical Review of Reviews*, November, 1917) says that work and exercise improve senile toxemias, especially when they are of renal origin. A sedentary life predisposes to senile toxemia. Work for the aged improves their mental state; it occupies their minds and stops them from thinking of old age. Money in their possession is better than medicine in some cases; it makes them independent.

Radium in the Treatment of Benign Pathological Conditions of the Urogenital Tract.—Winfield Ayres (*Urologic and Cutaneous Review*, January, 1918) concludes that while radium has a fairly wide range in urology other than in malignant disease it has its limitations. A thorough knowledge of its action is essential so that the proper dose may be applied to obtain the best results. The hazardous use of radium is to be discouraged and it should be used only under the advice of those who have made a study of it.

Heart Failure and the Administration of Digitalis.—H. L. Flint (*Practitioner*, November, 1917) asserts that the important factor which should determine when digitalis is to be administered is the nature of the cardiac rhythm. When heart failure occurs during an infectious fever, like pneumonia, rheumatism, or diphtheria, digitalis will have no effect. When cardiac failure occurs in any heart, whether healthy or diseased, which exhibits a normal rhythm, digitalis can serve no useful purpose. When the rhythm is abnormal the use of digitalis is indicated.

Fatal Result Following Injection Treatment of Hemorrhoids.—H. J. Spencer (*Journal A. M. A.*, January 26, 1918) reports a case of general septic infection with the gas bacillus and multiple liver abscesses resulting fatally twelve days after the injection of three large internal hemorrhoids with quinine and urea hydrochloride. Attention is called to the fact that the normal intestine often harbors the gas bacillus and that it is practically impossible to sterilize the mucous membrane of the rectum, so that there is always danger of these or other pathogenic organisms being introduced into the tissues when injections are made through the rectal mucosa.

Tonicity of the Wrist in Paralysis of the Ulnar Nerve.—André-Thomas (*Paris médical*, December 8, 1917) reports having frequently observed, in ulnar paralysis due to a wound, a flexed position of the hand. When the patient's elbows are resting on the table, with the forearms vertical, the hand of the injured side sags farther down in flexion than that of the opposite side. Passive flexion, furthermore, can be carried considerably further, sometimes almost as far as in radial paralysis. This is a puzzling observation, for from the distribution of the ulnar nerve one would expect a relative hypertonicity of the extensor muscles of the wrist and an increased range of extension rather than of flexion. Further examination of these cases showed, moreover, a greater resistance to extension than on the normal side, the tendons of the palmaris longus and brevis becoming prominent under the skin during forcible passive extension.

Miscellany from Home and Foreign Journals

Lipoids in 131 Specimens of Diabetic Blood.—

Horace Gray (*Boston Medical and Surgical Journal*, January 31, 1918) presents the following conclusions at the end of a long paper. The most satisfactory single determination for following a diabetic patient is Bloor's fat method—total fat—on the whole blood. There is a lipid threshold, by Bloor's method about 0.7 per cent., analogous to the glucose threshold of 0.1 per cent. A normal Bloor fat value was found only nine times in 124 bloods, i. e., only about seven per cent. of diabetics come inside the threshold of the normal range. The lipid increases in diabetes are most marked in glycerides, then in total fatty acid, cholesterol, and phosphatides. The increase of cholesterol beside the glycerides seems indeed pathognomonic of the long standing hyperlipemia of diabetes, contrasted with the acute hyperlipemia of overfeeding, which has been shown by Bloor to consist of only increased fatty acid. The maximal total lipid value of this series was 16.3 per cent. The plasma exhibited much greater increase of lipoids than the corpuscles. After ether anesthesia in one case, total fatty acid was increased, followed by a fall below that patient's level before anesthesia. Phosphatide and cholesterol were unchanged. Sex in diabetes makes no significant difference in lipid level. The greater the duration, the lower the lipoids; the higher the lipoids, the more unfavorable the prognosis and the greater the danger of deranged fat metabolism, acidosis, and coma. Overweight at the time blood is taken is accompanied by slightly high lipoids. Underweight at the time blood is taken is accompanied by markedly high lipoids. The greater the loss of weight, i. e., from maximal weight—presumably onset—to weight at time the last blood was taken, the lower the lipoids, compared with those patients whose weight loss has been less. High dietary fat is only roughly followed by higher lipoids. With acidosis the lipoids are above the level in diabetes without acidosis. The rise is about twice as great in moderate as in severe acidosis. This paradox may be related to the frequent finding that acidosis is most marked in acute cases, which presumably have not yet had time to pile up excess fat. With increasing carbohydrate balance the lipoids decrease. Hyperglycemia is only roughly accompanied by hyperlipemia. The latter runs much more closely parallel to the patient's general condition and promises, therefore, to displace blood sugar from its present position as an index to prognosis and treatment. When lipoids are high, the percentage of corpuscles in whole blood is apt to be either abnormally low or abnormally high. The general diabetic average is below normal. The term "lipemia" is loose and therefore undesirable. Hyperlipemia—supernormal lipoids—is not paralleled by lactescence—cloudy plasma—except when extreme. When the lipoids are only moderately supernormal, as is true in ninety-three per cent. of the specimens in this series, then the plasma cloudiness is by no means proportional. This series shows clear plasmas which, when tested, were found hyperlipemic, and cloudy plasmas which were found to have normal lipoids.

Interpretation of the Schick Reaction Among Army Recruits.—

Abraham Zingher (*Journal A. M. A.*, January 26, 1918) draws upon an experience of over 2,500 tests on as many recruits and points out the fact that the pseudoreactions are much more frequent among adults than among children, constituting a source of some trouble and confusion. Much of the confusion and uncertainty in the reading of the reactions can be obviated by the use of a control. The test should be performed as follows. A sample of the toxin to be used should be heated to 75° C. for five minutes to destroy the soluble, specific toxic fraction. On the right forearm the usual Schick test is made with a 1:1,000 dilution of the unheated toxin, while a similar control injection is made on the left forearm, using an equal volume of a 1.5:1,000 dilution of the heated toxin. The pseudoreaction shows a well marked redness after forty-eight hours at the site of both injections, but this fades rapidly so that by the end of ninety-six hours there is only a bluish brown area of pigmentation. A combined positive and pseudoreaction shows the signs just described at the end of forty-eight hours, but at ninety-six hours the right arm, infected with unheated toxin, shows a distinct area of active redness while the left arm shows only the bluish pigmentation. Straight positive tests show no reaction at the site of the control injection.

Bence-Jones Proteinuria.—Sydney R. Miller and Walter A. Baetjer (*Journal A. M. A.*, January 19, 1918) review some of the more significant views regarding this supposedly rare condition and point out that the occurrence of the Bence-Jones body in the urine is not wholly restricted to cases of multiple myeloma; also it does not always occur in cases with multiple myeloma, and it has been recorded in association with bone carcinoma and in both lymphatic and myeloid leucemia. It is not known where or how the body is produced, but it is suggested that it is a product of anomalous endogenous metabolism. No case has yet been recorded in which it has been definitely proved that the bone marrow was free from some pathological process. Seven cases of Bence-Jones proteinuria are reported as having come under the authors' observation within a year and a half. One was associated with a myelogenous leucemia and a second with myeloma. In the other five cases there were no bone lesions demonstrable by the most searching examination. In three of them the conditions was discovered by accident; in the other two there were symptoms similar to those of chronic nephritis with edema. In all cases there was hypertension and cylindruria. In the three without evidences of nephritis the phenolsulphonethalein excretion was normal. The Bence-Jones protein was the only one present in the urine in these cases. The occurrence of so many cases of Bence-Jones proteinuria and the finding of the protein in five cases without evidences of bone lesions suggest that the protein may not be so very uncommon as supposed and that its presence may often be overlooked in routine examinations.

Electrocardiographic Observations in Toxic Goitre.—Edward B. Krumblhaar (*American Journal of the Medical Sciences*, February, 1918) presents the following conclusions: In early cases of toxic goitre the characteristic tachycardia is not accompanied by any signs of myocardial change that are demonstrable with the string galvanometer. With persisting overaction of the heart, hypertrophy of either ventricle may become manifest. Progressive hypertrophy and overaction result in myocardial degeneration that may be manifested by any type of cardiac irregularity, sinus arrhythmia, premature contractions, auricular flutter, auricular fibrillation, heart block, etc. If the existing intoxication is the chief factor in the production of the arrhythmia, this may disappear with removal of the intoxication. Successful treatment, whether medical or surgical, improves the cardiac condition by this means, as shown not only by the occasional disappearance of an arrhythmia, but also by diminution in the size of the T wave and in the pulse pressure as well as by the general clinical condition. The development of diphasic or inverted T waves should probably be considered as influencing prognosis unfavorably.

Angina Pectoris.—James B. Herrick and Frank R. Nuzum (*Journal A. M. A.*, January 12, 1918) report their clinical experiences with over 200 cases, mainly seen in private practice and consultation. No cases of false angina are included. Among the special features noted was the fact that by far the most frequent exciting cause of an attack was walking, specially rapid walking against a wind or uphill. When the walking was performed soon after a heavy meal it was even more likely to provoke an attack. On the other hand the classical fit of anger was found to be a very rare cause of an attack. In four cases there was an interesting association of high grade anemia with typical angina, but it was impossible to state whether or not the anemia bore any causal relation to the angina. Several cases were seen in which the angular attack was due to coronary thrombosis. In some of these the thrombosis accompanied the first attack, while in others there had been repeated previous angular attacks. In not every case of thrombosis of the coronary, or one of its branches was the attack immediately fatal, some patients having lived for considerable periods. The thrombotic attacks were generally unusually severe, often with vomiting, and followed by shock or collapse. The pulse in these was often rapid, very feeble, and compressible, and the blood pressure was often low. In some dyspnea and cyanosis were extreme with great distention of the lungs. The pain in most of such cases was low in the chest or in the epigastrium and resembled that of some subphrenic condition. The prognosis was grave, but the average duration of life in fifty cases in which death occurred was almost three years. In the treatment of the condition nitrites were found to be almost specific for the relief of the attacks in only a small proportion of the cases, totally failing in many of the others. They should always be tried, however. Morphine was found of great value in the relief of the pain. The only other remedies of real value were the iodides and digitalis.

Spirochæta Icterohemorrhagiæ in American Wild Rats.—James W. Jobling and A. A. Eggstein (*Journal A. M. A.*, November 24, 1917) examined over a hundred wild rats caught about Nashville and found that at least ten per cent. of them were infected with the *Spirochæta ictero-hemorrhagiæ*. They also recall the fact that Noguchi found similar infection of the rats wild in New York. With the institution of training in trench warfare in our home cantonments the conditions for the outbreak and spread of infectious jaundice would be analogous to those in France and steps should be taken in advance to prevent such an occurrence.

Bruck Precipitation Test for Syphilis.—Arthur William Stillians (*Journal A. M. A.*, December 15, 1917) describes the technic of this new test, recently put forth by Bruck as a simple and valuable aid in the diagnosis of syphilis. The test rests on the measure of the solubility in water of the nitric acid precipitate of the blood serum. As the result of an investigation of this test in 209 cases, Stillians concludes that it is practically worthless as it fails in a considerable proportion of cases of early secondary syphilis, gives positive reactions in about twenty-five per cent. of nonsyphilitics, and disagrees with the Wassermann reaction in over twenty-five per cent. of instances.

Stereoscopic Röntgenograms of the Head.—J. M. Ingersoll (*Annals of Otolaryngology and Rhinology*, September, 1917) has been convinced of the practical value of stereoröntgenograms, which give definite information in regard to the nose and the accessory sinuses, the brain and many of its bloodvessels, and the ear and the mastoid, which cannot be obtained in any other way. The size and boundaries of the maxillary and frontal sinuses can be distinctly seen, and any septum tumors or foreign bodies in these cavities can be accurately located and defined. The ethmoidal and sphenoidal sinuses, because they overlie each other, are somewhat masked, but their relative position to each other and the orbit and to other surrounding structures can be clearly distinguished.

Studies of Lung Volume.—A. Garvin, Christen Lundsgaard, and Donald D. Van Slyke, (*Journal of Experimental Medicine*, January, 1918) determined the total capacity, middle capacity, residual air, and the chest ^{expiratory} volumes, and calculated the normal lung volumes ⁱⁿ thirty-one tuberculous men. They found the total lung volume within normal limits in nine cases of incipient tuberculosis, but the vital capacity was decreased, as a result of an increased residual air, which in turn was caused by inability to expire as deeply as normally. This is apparent in the decreased movement of the diaphragm and the decreased difference between the chest volume after total expiration and in the middle position. The middle capacity was practically normal. In twenty-two cases of moderately advanced and advanced tuberculosis the total lung volume and vital capacity were decreased in most of the cases, the latter mostly as the result of the diminished total capacity. The residual air was generally normal and the middle capacity varied in different individuals, being normal in some and considerably diminished in others.

Late Brain Inflammation after Cranial Operations.—Jumentie and Sentis (*Presse médicale*, November 29, 1917) report a number of cases of this nature in which complete and permanent recovery took place without a second operation. The symptoms differed from those of brain abscess only in a less pronounced interference with the mental processes and the early favorable trend of the condition. Although convulsive disturbances were observed, the condition is ascribed to a temporary inflammation, without suppuration.

Asthma Associated With Ethmoidal Disease.—John Mackenzie Brown (*Annals of Otolaryngology and Laryngology*, June, 1917) remarks that for a long time the association of chronic ethmoiditis and asthma is an intimate one and that a deviated septum or a similar lesion within the nose may aggravate the symptoms. It has been further noticed that great improvement in the symptoms manifested has followed the removal of the pathological nasal lesions; in some cases this has necessitated the extirpation of the diseased ethmoidal labyrinth.

Blood in the Stools in Duodenal Ulcer.—August J. P. Pacini (*Medical Record*, December 1, 1917) considers that the finding of occult blood in the stools of patients with a suggestive history warrants a diagnosis of duodenal ulcer. Extraintestinal sources of bleeding must be ruled out, as hemorrhoids and vaginal discharges in women. Pacini gives a table of thirty-two cases where a diagnosis was made on occult blood findings in the feces and where the diagnosis was confirmed at operation. The examination of the stools should include the guaiac test, the benzidin test, spectroscopic search for hematin, and microscopic search for hemin crystals.

Intracutaneous Reaction in Meningococcus Carriers.—Frederick P. Gay and A. J. Minaker (*Journal A. M. A.*, January 26, 1918) emphasize the fact that the usual tests for antibodies yield no results of value in meningococcus carriers, but tests with a specially prepared meningococcus substance seem to indicate the occurrence of an intradermal reaction of some diagnostic value. Five strains of representative meningococci are grown separately on one per cent. starch agar without peptone. The forty-eight hour cultures are transferred to sterile salt solution, mixed, and precipitated with alcohol. They are then washed with a second portion of alcohol, then with ether, then centrifugalized and dried in partial vacuum over sulphuric acid for two days. The dry mass is then ground in an agate mortar to an impalpable powder and dried again for a day. A suspension of this is next made in normal saline containing 0.5 per cent. phenol. The strength of this suspension is such that the dose of 0.05 mil contains 0.006 mgm. of the dried substance. This is then used for the usual intradermal test, a positive reaction consisting of a well marked red, indurated area of three to seven millimetres diameter, which is best marked at the end of twenty-four to twenty-eight hours and disappears in forty-eight hours. Trials of the test gave 64.5 per cent. of positive results in thirty-one known carriers as compared with only 26.4 per cent. of positives in thirty-eight noncarriers. The value of the test remains to be determined.

Effect of Stimulation of Sensory Nerves upon the Rate of Liberation of Epinephrin from the Adrenals.—G. N. Stewart and J. M. Rogoff (*Journal of Experimental Medicine*, November, 1917) attempted to determine whether stimulation of afferent nerves, sciatic and brachial, produced a detectable increase in the rate of liberation of epinephrin from the adrenals. Adrenal vein blood was tested on rabbit intestine and uterus segments, with negative results.

Action of Spinal Fluid on Growth of Meningococcus.—Cresswell Shearer (*Lancet*, November 10, 1917) reports a series of experiments in which he shows that normal spinal fluid contains some substance which markedly stimulates the growth of the meningococcus on artificial culture mediums. This stimulant property is materially greater in the case of the spinal fluid than is that shown by either the blood or the nasal secretion. This discovery suggests the explanation for the predilection of the meningococcus for the spinal and cerebral tissues.

Localization of Streptococcus Viridans.—H. K. Detweiler and H. B. Maitland (*Journal of Experimental Medicine*, January, 1918) were unable to substantiate fully the theory of the power of selective action of *Streptococcus viridans*. A few of the strains studied, vastly in the minority, tended to localize in a particular tissue, but this happened without relation to their origin, as a streptococcus causing appendicitis in a patient attacked the nervous system of four rabbits. Regardless of the site of origin in the patient, *Streptococcus viridans* produced most lesions in the heart and joints.

Report of the Committee on Uniformity in the Wassermann Reaction.—The members of this committee (*Southern Medical Journal*, February, 1917) attribute the great variation in the results obtained with the Wassermann reaction to four factors: 1. Wide variation in the technic and the reagents employed. 2. Failure to standardize all reagents before each test. 3. Lack of controls of patient's serum and antigen in each test. 4. Irregularities in the character and preparation of the antigens employed.

Trauma and Locomotor Ataxia.—Eugenio Terzile (*Gazzetta degli ospedali e delle cliniche*, January 7, 1917) reports a case of tabes coming on in a man of sixty-five years following a fall from a ladder. An interesting feature of the case is that of the possibility of recovering compensation or damages from either the employer or insurance carrier. Points involved are the impossibility of absolutely excluding syphilis and alcoholism and the possibility that the tabes existed in an undiscovered form before the accident.

The Presence of Bacteria of Secondary Infection in Pulmonary Tuberculosis.—Hall and Harvey (*Journal of Medical Research*, January, 1917) report the results of their study of the blood in the expectation of finding a bacteriemia having its origin in the lesion of a secondary pulmonary lesion. Of fifty-two blood cultures from forty-three patients with pulmonary tuberculosis, two were positive. It would seem, therefore, that severe pulmonary tuberculosis, even with secondary infection, is rarely accompanied by a bacteriemia.

Proceedings of National and Local Societies

THE NEW YORK NEUROLOGICAL SOCIETY.

Regular Meeting, Held March 6, 1917.

The President, Dr. FREDERICK TILNEY, in the Chair.

The Place of a Psychiatric Clinic in a Penal Institution.—An abstract of this paper, by Dr. BERNARD GUEUCK, director of the Psychiatric Clinic at Sing Sing Prison, was published in the April 21, 1917, issue of the *NEW YORK MEDICAL JOURNAL*.

Dr. SMITH ELY JELLIFFE, of New York, said that a ray of optimism was beginning to lighten the problem of the criminal, as a result of Osborne's activities, the psychanalytic movement, and now the studies of Doctor Glueck. The community might look, as he did himself, for a more enlightened understanding on the part of those whose business it was to understand crime.

Dr. BERNARD SACHS, of New York, said that he felt it was a pity one could not get at some of the other social problems in as thorough a manner as criminology was being studied. Doctor Glueck's work showed that excellent work was being done for those who offended against the statutes of the law. Work was also needed in behalf of those who had other social grievances, who had not succeeded in making a success of life, who were suffering from poverty. Some day perhaps the poverty stricken would be gathered together and the reason for their social defects studied, their guilt or innocence analyzed.

Referring to Doctor Glueck's paper, it was noticeable that every cause that had seemed to lead to social maladjustment had been taken into consideration; but taking the community at large it was safe to say that the vast majority of those who did not become criminals had known these same conditions somewhere in their course through life. What was there in addition to this list of conditions that helped to develop criminals? There must be some one cause; or perhaps a few, more important than all the others. The offending criminal was the victim chiefly of heredity and environment, but that was true in all diseased mental conditions that did not necessarily develop into criminality. The problem would bear the closest study. The speaker was glad to hear that Dr. Glueck had a word to say in denial of the general belief that the defective delinquent was necessarily a potential criminal. By accident of life a defective might become a criminal, but the probability was not as great as had been declared.

The remarkably orderly behavior of 1,500 prisoners when the lights were accidentally turned out might be capable of another interpretation than that given by Doctor Glueck. Among an equally large group of free men this sudden darkness would undoubtedly be met by very different conduct, and it occurred to the speaker that the orderliness of the prisoners was not so much due to the rules of self-government as to the latent fear of punishment.

Dr. L. CASAMAJOR, of New York, believed that it might be necessary to change the definition of the word justice, among others. At present the word

meant forcing the criminal to give up something of his freedom, his happiness, or his property as a recompense to society for having broken its laws. That might be justice to society, but was it justice to the criminal? The work now being done at Sing Sing showed how ineffectual was this old idea of curing criminality. Society had paid too much attention to what the criminal had done to it and now it was time to find out what society had done to the criminal. There could be no such thing as a "criminal class." Doctor Glueck's diagrams showed some of the conditions which led to the downfall of this group of criminals, and these were the same as those of many other people not in prison. Criminals did not constitute a class, but each one was an individual problem of personal makeup and of environment and that meant society. The closing years of the eighteenth century saw the birth of ideals of honesty and fairness in the treatment of the insane. Were these opening years of the twentieth century to see the birth of the same ideals in the treatment of another unfortunate group, the criminals?

Dr. WILLIAM STEINACH, of New York, said that there was necessity for a psychiatric clinic at Sing Sing, but there should also be one at the Tombs where the prisoners were first received and from where they were sent to the various prisons and reformatories of the State. Work of this character would furnish a large body of accurate data from which valuable deductions in criminology and anti-social conduct might be made. The speaker had often wondered, not that there were so many criminals, but why there were not more. The intelligence of children was looked after through compulsory attendance at school, but their ethical and emotional side was supposedly developed at home or through ethical and religious agencies. However, in many cases there was no one to look after many children who, especially in the congested districts, were thrown upon the streets at a tender age. As a consequence, these children, having little or no home influence, grew up like weeds, and what emotional training they received was picked up haphazard. It was not to be wondered at that they grew up ethical imbeciles, as it were, and as a result became anti-social and even criminal at times. The problem, then, should also be attacked from this standpoint and an effort made to supply in some way this deficient moral and ethical education.

Dr. FRANK WADE ROBERTSON, of New York, said that it was a matter of historical interest that at the New York State Reformatory, beginning with the year 1805-1806, great attention was paid to the study and treatment of the mentally defective. In 1900, when he left Bellevue and went to Elmira at the request of the board of managers, he made a careful analysis of the population of the reformatory. This resulted in the discovery that out of about 1,300 men, seventy were insane; they were subsequently transferred to the Matteawan State Hospital. Much criticism resulted, the insanity of these men being attributed to their treatment at Elmira, but as a matter of fact careful examination

showed that the insanity had preceded their commitment and had undoubtedly been a factor leading to their criminal behavior. As the speaker recalled the figures, ten per cent. of the inmates at Elmira were epileptics, thirty per cent. were mentally deficient, and fifty per cent. were physically below par.

The question of discipline in prison was very important and had much to do with the development of mental disease. Infractions of discipline occurred in proportion to the requirements of discipline; strict rules met more infractions than lax ones. The treatment of criminals would eventually prove to be a medical problem. Under present conditions, this was not feasible for the head of an institution containing over a thousand inmates could not give individual attention to them. In the General Superintendent's Report for 1901, the speaker had suggested for Elmira a division of the population into groups of 100 or more and the appointment of a psychiatrist in charge of each group that a careful study might be undertaken with a view to securing a better understanding of their mental endowments, thus helping the discipline and assisting the men toward a proper conception of their obligations to society. This had not yet been done. Nevertheless the records of the histories of the men who had been discharged or paroled from Elmira showed that only fifteen per cent. were later convicted of crime; fully sixty per cent. did not again resort to it.

Doctor GLUECK, in closing the discussion, said, in answer to Doctor Sachs's query, that he did not believe it was fear of punishment that made the assemblage of 1,500 men so orderly when the lights were suddenly extinguished. Greater fear of punishment must have existed under the old system of government by force, for punishment was not now what it was under the old régime, and yet in the old days pandemonium would have broken loose under such conditions. The men realized the value to themselves of good behavior. The group of men outside the prison might riot under such conditions for there was no reason for them to think they would be judged and condemned for it, but the inmates of Sing Sing realized more was required of them and they tried to live up to it. The fact that some one had told them he believed there was good in them brought out the good; they were stimulated to show he was right.

The system at Sing Sing had not changed materially under the present warden from the system during the régime of Osborne. This was in spite of the fact that Warden Mayer came to the prison prejudiced against the system by hearsay. The idea of selfgovernment had no better friend today than the warden who had seen it practically illustrated. In speaking of some of the apparent etiological factors of crime, the speaker did not intend to convey that the man who had one or more of them was destined to go to prison, or that they were the essentials of criminal behavior. They were put on the charts for purposes of study and comparison. A man with dementia præcox might not become a criminal, but it was easy to understand how he might become one, if he had delusional ideas, unless

he was protected. There were many more defectives outside of prison than in it, and it was largely a question of proper protection, home environment, and care. A frequent occurrence in the histories of these men was that a number of them had never succeeded in adequately differentiating themselves from their environment, never had a clear cut conception of the rights of the individual. There was no distinction for them between mine and thine. The speaker said he was familiar with the excellent work Doctor Christian was doing at Elmira. But it seemed to be true that most juvenile penal institutions did not lead to reform, but tended to perpetuate criminal tendencies.

Treatment of Paresis by Intraventricular Injections of Salvarsan.—Dr. NORMAN SHARPE, of New York, reported on thirteen cases and presented five of them. He said that most of them had so far responded very satisfactorily, improving mentally and physically and being able to do work they could not do before which, from a sociological standpoint alone, made this operation worthy of fair trial. In all thirteen, both the clinical symptoms and the serology were positive for paresis. In the first patient injected intraventricularly, January, 1915, salvarsanized serum was used. The remaining twelve received solutions of neosalvarsan and salvarsan in blood serum. The first injection in each case was given under ether because of the trephining, but all subsequent injections were given under local anesthesia. There had been no deaths and no accidents. In some of the cases the temperature rose to 101° or 102° F. for twelve to twenty hours following injections and the pulse to 110. This reaction occurred for the most part in the patients given ether. At no time were the reactions severe enough to give rise to uneasiness. The majority of cases were out of bed the second day and left the hospital on the fourth day. Of the thirteen patients, five had returned to work following several months of quiet and rest after treatment, had been at work for four to seventeen months, and were now at work. Examinations were made at intervals in all the cases to guard against possible recurrence.

In the first cases, the dose for each injection was 0.6 mgm. salvarsan. In the cases lately injected double this dose had been given with no more reaction, either of temperature or pulse rate, than when the smaller dose was used. Thirty-seven injections in all were given and the results showed that this method could be accomplished successfully without any danger to the patient at all. The effect of the injection when made into the ventricle had a far wider distribution than when made into the spinal fluid. Nine of the thirteen cases showed improvement of the clinical symptoms of paresis and in some cases there was apparently definite arrest of the disease process. The advantages of the intraventricular method were apparent. Placing the serum in the lateral ventricles was placing it sub-archnoidally at once, and also insured an even distribution over both hemispheres in juxtaposition to the cortical cells before it was drained out of the cranium. Furthermore, the ventricular puncture obviated the lumbar puncture which was necessary in the subdural method before the serum was intro-

duced. Again the ventricular method brought the serum in contact with tissues that were not reached by the subdural route, namely the ventricular system itself and the base of the brain. Finally, it had been shown that the perivascular sheath spaces, extending between the neurons deeply into the brain substance and draining it of waste products, communicated directly with the subarachnoid space. A serum, therefore, placed beneath the arachnoid membrane, came into contact with the brain tissue and this end was achieved best by the ventricular method.

The speaker believed that one should be guided in regard to the number of injections by the serology and by the clinical symptoms. If the serology did not show progressive improvement steadily under treatment, the clinical symptoms should be the guide. The number of injections naturally varied with different patients and according to the extent and the severity of the disease process. It had been found safe to increase gradually the amount of salvarsan in the serum and in this way to reduce the number of injections necessary. Five conclusions had been arrived at in regard to this method: 1. In comparison with the serious nature of paresis, the hazard of intradural treatment, by whatever method, was of little moment. 2. On experimental and clinical grounds, both the subdural and intraventricular methods were superior to the intraspinal route in the treatment of paresis. 3. From an experimental and theoretical standpoint, the intraventricular method was superior to the subdural route and safer. 4. The intraventricular method, with careful technic and a due regard for the anatomy of the brain and the delicate nature of the tissues invaded, was practically free from danger. 5. If the freedom from unfavorable symptoms so far achieved in intraventricular injection could be maintained, it would be imperative so to treat paresis in its earliest stages, with greater chance of marked improvement and perhaps permanent arrest of symptoms.

Regular Meeting, Held April 3, 1917.

The President, Dr. FREDERICK TILNEY, in the Chair.

Discussion of Doctor Sharpe's paper read at the March 6th meeting was continued at this meeting.

Dr. G. M. HAMMOND, of New York, said that he had had opportunity to examine the thirteen cases treated by Doctor Sharpe by his intraventricular method as they had all come from either his service at the hospital or his private practice. They were all unmistakably typical of paresis; the histories were gone into in detail and complete examination made, including all the laboratory tests of the spinal fluid, among them the colloidal gold test. In all but two of the cases, this test was beautifully demonstrated. The two cases referred to were both far advanced in the disease; in fact, both had since died in the terminal stage, and yet in neither case was the typical gold reaction obtained. In regard to the cell count, there was a wide variation between that of the ventricular fluid and the spinal fluid, the ventricular fluid generally containing many more cells.

Personally, the speaker had always been sceptical about all forms of new treatment; he had not known whether this one would be successful or not, but was

willing to make the attempt. The improvement in all the cases was the result. In the first place, the operation was perfectly safe, no patient having been in bed more than three days and all leaving the hospital on the fifth day. There had been no deaths. As regarded the clinical symptoms, there had been improvement in every one. In five out of thirteen cases marked improvement had taken place so that the men were now selfsupporting. Of course more cases were needed and a longer time must elapse before a positive statement could be made in regard to the final efficacy of the treatment; but, though the colloidal gold test was still positive, these five patients had gone back to work, could transact business, had better memories, no longer had any ideas of an expansive nature, and showed progressive and steadfast improvement which had been maintained for some time. Thus this method of treatment had accomplished more than any other. With only one out of 100, it would be better than anything done before, especially as the operation was perfectly safe. Whether these results were going to be maintained or sustained, there was no means as yet of knowing, but a few years would show.

Dr. J. WHEELER SMITH, Jr., of New York, spoke of the laboratory work done in the conduct of the series of Doctor Sharpe's cases. This might be considered under two heads: the preparation of the medicated serums and the examination of the patients' blood serum and cerebral and spinal fluids. A small portion of the serum from the blood, drawn for the preparation of the medicated serum, was put aside each time and was submitted to the complement fixation test for syphilis. Cases III, V, VII, and VIII gave negative reactions before intraventricular treatment was begun. The reaction had remained negative in cases III, V, and VIII. Case VII showed a positive reaction; this was simply an instance illustrative of the greater delicacy of icebox fixation. Six cases gave positive blood reactions before treatment and in five of these the test was still just as strongly positive; in the remaining case there appeared to be a diminution in the degree of positivity. Except in the last case, there was no evidence of any effect by this treatment upon the complement fixation reactions of the blood serums in this series of cases.

A specimen of the cerebral fluid was obtained just prior to each intraventricular injection. For various reasons some or all of the examinations were not made of some of the specimens. Some of them were too bloody, some were delayed in transit from the operating room to the laboratory, and occasionally a specimen was mislaid or lost.

The globulin tests used were the phenol test of Pandey, the ammonium sulphate tests of Nonne and of Ross-Jones, and the butyric acid sodium hydrate test of Noguchi. The globulin content, both in the cerebral and in the spinal fluids, was definitely diminished by this treatment. The effect of treatment upon the Wassermann reaction was appreciable in two cases. The colloidal gold reaction was a valuable aid in the diagnosis of syphilis of the central nervous system, in particular of paresis. Although a satisfactory theoretical basis for the reaction had not been advanced, the test seemed to be of great

practical value. Seven cases all gave typical paretic curves, both with cerebral fluids and with spinal fluids. In two of these a transient effect was produced upon the curves; in five no appreciable change had been wrought in the colloidal gold reactions.

Summarizing, it could be stated that the blood serum, the cerebral fluid, and the spinal fluid of eleven cases of paresis undergoing intraventricular treatment with neosalvarsanized or salvarsanized serum were examined at irregular intervals, usually before treatment, after the first treatment, after the second treatment, and after the third treatment. Some cases had been examined since, after a lapse of four to eight months. The fluid changes were either nil or so slight as to be negligible in most instances. The only conclusion possible was that three intraventricular injections of salvarsanized serum were not sufficient to produce fluid changes, though the clinical improvement was marked.

Doctor SHARPE, closing the discussion, said that he wished to emphasize Doctor Hammond's statement in regard to the safety of the treatment. Out of thirty-seven injections, no accidents and no deaths had resulted and the only reactions consisted of a rise in temperature and pulse rate for twenty-four hours following the injections in some of the cases. It was, as Doctor Hammond said, too early to hold that any of the cases were cured, but when it was recalled that the five patients now greatly improved and back at work had had symptoms of paresis varying from a few months up to two years before treatment, during which time they had been incapacitated for work, and when consideration was given to the condition these paretics would now otherwise have been in if untreated, it was apparent that something indeed had been accomplished. The speaker felt very much encouraged by the results of the last two years' work in these cases.

Congenital Cerebrocerebellar Diplegics.—Dr. L. PIERCE CLARK, of New York, reported three cases of cerebrocerebellar diplegia and spoke of the experience which had been obtained in caring for and training such children. The term, cerebrocerebellar diplegia, was used for a combination of symptoms dependent upon cerebellar agenesis or some form of injury to the cerebellum at the time of or before birth, the exact nature of which had not yet been determined. The varying types of the disorder were those of flaccid and flaccid spastic palsy, and shaded into the general, mildly spastic state. In the cerebellar ataxic type there was hypotonia, dysmetria, gross incoordination, astasia, abasia, dysarthria, occasionally dysphagia, and often complete inability to sit up. In extreme involvement of the forebrain all these cerebellar symptoms were present together with mutism and idiocy. In the mixed types there might be either a slight degree of spasticity in certain parts, combined with hypotonia or flaccidity in other parts of the body.

It was interesting to speculate what ultimately became of these children affected with congenital cerebrocerebellar palsy. No doubt the children possessing the mildest grades of defect quickly outgrew the disorder. The severest types drifted to special institutions for mental defectives. Prognosis of all the varying types of course depended upon the com-

bination of symptoms presented. When the forebrain was damaged to such an extent that the mental state was no longer to be classed as retardation, but showed mental arrest or marked imbecility, these children usually never recovered either from their ataxia or from their defect in mental development. In the less severe types, one should be quite sure that the mental state was one of simple retardation or mental arrest, as much of the definiteness of prognosis could not be determined until one had made a very decided effort to train out the cerebellar symptoms, or force the forebrain to take up vicariously the functions of the cerebellum.

While the principles of treatment embraced mental as well as motor training, the primary point of approach was to be directed toward overcoming the motor defects. First of all, segmental incoordination was to be removed. The child was to be taught to appreciate, by actual manipulation, the flexion, extension, abduction, and adduction of the different segments of the extremities. Frenkel's principles for training trunk incoordinations, laid down for cases of tabetic ataxia, were of the utmost importance. When one had obtained results in removing the segmental defects, there still remained the general motor training for the use of simple, isolated contractions of segments in purposive acts in which all the segments of an extremity were coordinated harmoniously. One might then undertake more definite principles of motor training as laid down in the Montessori, Seguin, and other special school systems, where under the guise of play the child was further taught to develop coordination.

In many cases there was ataxia of speech for which training was needed on the same principles as those used for the deaf and dumb. The process of teaching the child the complicated mechanism of speech was often long and tedious. The temperamental defects which invariably went with these cases of congenital cerebrocerebellar diplegia, was an important feature to be handled. The disciplinary system of nursery ethics had much to do toward helping the child to develop out of his motor and mental disorder. The training should be followed for a number of years under the direction of a capable nurse teacher. The child's disposition should be studied and his interests, ambitions, and physical and mental dislikes taken into consideration. The underlying principle was really to help the child to develop along the lines of his inclination and to build about the central core of his interest. The results of four years' experience had convinced the speaker that not only might the training system he had employed be of service to this type of cerebellar disorder, but it might serve to encourage a more persistent and careful training of children suffering from cerebral palsies and the simpler types of feeble-mindedness where similar cerebellar symptoms of incoordination existed.

Dr. CHARLES L. DANA, of New York, said that he had no criticism or suggestion to make regarding the training and reeducation of this class of cases as he considered Doctor Clark's recommendations correct and admirable. The speaker was especially interested in the fact that there were cases of cerebellar diplegia without mental defect and so more typically

and truly cerebellar than most of those described by Doctor Clark.

H. Voght, in Lewandowsky's *Handbook*, referred to the large range in the degree to which the cerebellum was involved in congenital cases, but few typical and purely cerebellar cases had been fully described. The speaker had watched a case for twenty-five years in which the cerebellum alone was slightly defective. The patient, a very intelligent person, had never been able to dance or join in active play; she had to balance herself carefully in walking, stood in a cerebellar attitude and had a little tremor of the hands. Conjugate deviation of the eyes was difficult, but she had no nystagmus. If one were to study carefully the cases of persons regarded perhaps as only naturally very awkward and of poor equilibrium, it might be discovered that mild cerebellar defects were a more frequent feature than supposed heretofore, and by proper methods of education the handicap might be much lessened. So one value of this paper of Doctor Clark's might lie in directing attention somewhat from the subject of cerebral and mental defects to the frequency and importance of cerebellar defects.

(To be continued.)

Book Reviews.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

History of Medicinal Plants. By WILLIAM MANSFIELD, A. M., Ph.D., Professor of Histology and Pharmacognosy, College of Pharmacy of the City of New York, Columbia University. First Edition. First Thousand. New York: John Wiley & Sons, Inc., 1916. London: Chapman & Hall, Limited, 1916. Pp. xi-305.

Doctor Mansfield has here brought together in an attractive form, a practical knowledge and a practical study of the histology of some of the more important medicinal plants. To the student of pharmacy, such a work would be of much value. The medical student will find a clear description of the various forms of plant cells found in drugs and also in all vegetable substances, and one who is interested in the study of digestive processes and the action of these processes on vegetable matters can learn much of the structure in consideration of a study of this work, even if it is more distinctly prepared for a study of medicinal substances, following the earlier manuals of Jelliffe, Kramer, and others.

Manual of Laboratory Diagnosis. By STELLA M. GARDNER, M. D., and MARY C. LINCOLN, Ph. B., M. D., formerly Assistant Professors of Laboratory Diagnosis, College of Medicine, University of Illinois. Chicago: Chicago Medical Book Company, 1917. Pp. 133. (Price \$1.25.)

This book is no more nor less than a short, concise guide to the modern methods of clinical laboratory diagnosis, in which the authors have recorded the technic and tests followed by themselves. No attempt is made to include more than a single satisfactory method for any one test or more than one test for the determination of a given point. The examination of the blood, urine, gastric contents, feces, human milk, cerebrospinal fluid, and sputum are given in practical form and the volume also includes a short chapter on bacteriological examinations and another on the three serum reactions, the Widal test, the Wassermann reaction, and the complement fixation test for gonorrhea. The book is intended as a guide to refresh the memory of the laboratory worker and the clinician, and as such it should prove useful owing to its convenience of size and arrangement.

Color Pictures. An introduction to Clinical Hematology. By CECIL PRICE-JONES, M. B. (Lond.), Captain R. A. M. C. (T. C.), Bacteriologist, British Expeditionary Force; Formerly Assistant Pathologist Middlesex Hospital Cancer Research Laboratories; Assistant Bacteriologist Guy's Hospital, London, S. E., etc. With five colored plates and four illustrations in the text. New York: William Wood & Company, 1917. Pp. 91. (Price \$2.00.)

The author says that it was his purpose in this booklet to furnish clinicians with some guide to the interpretation of laboratory reports upon blood examinations. The purpose has been most excellently fulfilled in a brief volume which is replete with really valuable information and free from the cumbersome details which are of little or no interest to the practitioner who does not do his own hematological work. The essence of the plan of presentation is a brief, clear discussion of the influence of various factors, such as infections, blood diseases and the like, upon the normal blood picture, following these with a few representative examples of actual findings. An ingenious method is suggested for the recording of so called "incomplete blood pictures," or those obtained from the skilled estimation of the proportions of the various blood cells as seen in a stained blood film. This consists in recording the apparent deviations from the normal by "+" when the cells seem to be increased; "-" when they are apparently decreased; and "o" when there is no apparent deviation from normal. This does not convey the idea of accuracy which even avowedly estimated figures do, yet it indicates the direction and apparent degree of deviation from normal. For the numbers of plus and minus signs can be varied according to the conditions. In addition to this helpful plan, the author has classified blood pictures into those due to bacterial infections, to protozoal infections, to blood diseases, and to malignant disease. Several excellent colored plates are included in the volume. It is difficult to see how the book could fail to prove helpful to the clinician in interpreting the reports which he receives from the laboratory.

Births, Marriages, and Deaths.

Died.

- BROWNE.—In Woonsocket, R. I., on Monday, January 28th, Dr. Wilfred W. Browne.
 BUELL.—In San Francisco, Cal., on Monday, February 4th, Dr. William E. Buell, aged forty-two years.
 CASSIDY.—In Norwich, Conn., on Monday, January 28th, Dr. Patrick I. Cassidy, aged forty-three years.
 CONNOR.—In Philadelphia, Pa., on Tuesday, January 29th, Dr. Annie L. Connor, aged forty-two years.
 CRAIG.—In Philadelphia, Pa., on Saturday, January 26th, Dr. John Martin Craig, aged fifty-five years.
 CROSBY.—In Atlantic City, N. J., on Thursday, February 7th, Dr. George W. Crosby, aged sixty-six years.
 GARDNER.—In New York, on Sunday, February 24th, Dr. Frank Harris Gardner, First Lieutenant, Medical Reserve Corps, U. S. Army, aged twenty-eight years.
 GORDON.—In Quincy, Mass., on Friday, January 25th, Dr. John Alexander Gordon, aged seventy-five years.
 HARRINGTON.—In Yonkers, N. Y., on Sunday, February 24th, Dr. Edwin I. Harrington, aged sixty-two years.
 JONES.—In Basking Ridge, N. J., on Saturday, February 6th, Dr. Frederick Childs Jones, aged sixty-three years.
 KARSNER.—In Philadelphia, Pa., on Friday, February 8th, Dr. Daniel Karsner, aged sixty-five years.
 LEWIS.—In Little Rock, Ark., on Thursday, January 24th, Dr. Jacob Franklin Lewis, aged sixty-five years.
 LUHRSEN.—In Brooklyn, N. Y., on Sunday, February 3d, Dr. Ernest Frederick Luhrsen, aged forty-two years.
 MALSCH.—In Victoria, Tex., on Sunday, January 27th, Dr. Edmund A. Malsch, aged fifty years.
 MILLIKEN.—In Placerville, Cal., on Saturday, January 26th, Dr. A. Milliken, aged eighty-five years.
 ROTH.—In New York, N. Y., on Sunday, February 3d, Dr. Frederick C. Roth, aged forty-nine years.
 SAWIN.—In Somerville, Mass., on Friday, February 15th, Dr. Charles Dexter Sawin, aged sixty-one years.
 SEVERANCE.—In Camden, N. J., on Saturday, February 9th, Dr. Ella Eliza Severance, aged sixty-one years.

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Original Communications

SHOES, PHYSIOLOGICAL AND THERAPEUTIC.

By DEXTER D. ASHLEY, M. D.,
New York.

Many men, otherwise physically fit, have been debarred by reason of foot disability or deformity from becoming officers in the army or entering a chosen branch of the service. Because of the generally good lines of the army shoe (Fig. 1), many men who have mild metatarsal weakness or deformity will be cured of their affliction. The unbalanced, pronated foot in a recruit, when not discovered and corrected by a modified shoe, may become a rigid flat foot, and the soldier a burden to

flat heel seat (Figs. 4, 5 and 6) sloping forward; a counter and heel seat not conforming to the wearer's heel (Fig. 6); fullness over the internal arch; extended outer sole; and deficient extension of sole to the inner side and behind the ball, at once tending to disturb the balance of the foot and prevent an approach to normal foot action.

The best of these shoes should not be considered therapeutic in their action. These shoes may be modified, when the patient cannot afford a custom made shoe, or, as often happens, when the "made to order" shoe is no better or even worse (Fig. 11). In many cases of minor affections these shoes will meet the demands.

The best shoe manufacturers, who have produced shoes approaching the physiological, are compelled to make shoes in the prevailing styles. Thus many purchasers delude themselves in thinking that they are wearing a well formed shoe because the maker has the name of making a good shoe, although they have indulged their fancy and selected the extreme form dictated by fashion. On the other hand, those who desire to wear a physiological shoe are generally burdened with a heavy, toe pinching, so called orthopedic shoe which the "shoe doctor" clerk insists is the last word in physiological footwear. These shoes (Fig. 4), with a few notable exceptions, purport to sustain the inner longitudinal

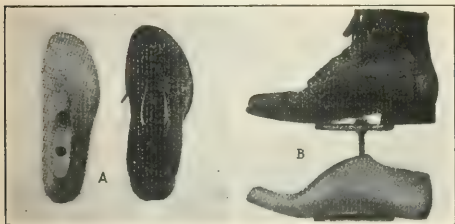


FIG. 1.—Army shoe and lasts. This is the pattern of the shoe which is considered to permit the best mechanical action of the foot when properly fitted. Civilians' shoes do not need to be so heavy and strong. (From Munson's *The Soldier's Foot and the Military Shoe*.)

the state for life, as has been experienced by the Canadians.

We have passed, it is to be hoped, the crest of the wave of viciously formed shoes, especially in shoes for women. "To every action there is an equal and opposite reaction." May we not hope that the ebb tide will give us a sensible, sane shoe for every day use? Already there has been a marked betterment in the sensible walking shoe. Our climate demands a shoe, not to support, but to protect. Many women are seen wearing low, broad heels made on English lasts, a start in the right direction, although these heels are unnecessarily broad and the counter out of all proportion to the heel of the wearer. As stated before, the physiological shoe should conform to the normal foot when in action. There are several shoes in the market approaching this in design. Each of these retains some of the defects heretofore enumerated, such as a high heel set too far back (Fig. 3), a broad,

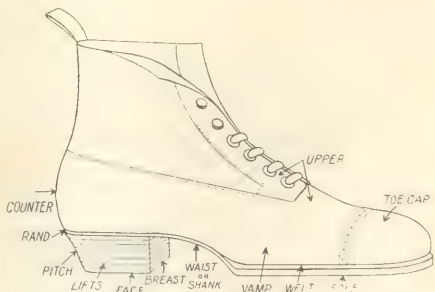


FIG. 2.—Various parts of the shoe. The artist has drawn a very good looking shoe; the heel is set well forward, as it should be.

arch, that being the one part of the foot which in the general mind can produce suffering which will cripple the foot function.

In the design of a physiological shoe many manufacturers and doctors will meet upon a plane of

understanding and approval. The therapeutic shoe will be a source of greater difference of opinion; among orthopedists, in regard to the form and functions of the foot brace, there are advocates of the rigid shank and of the flexible shank, the broad waist and the snug waist, the extremely low, broad

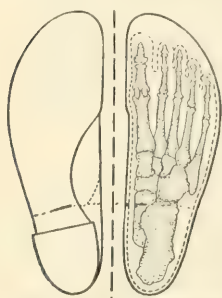


FIG. 3.—One manufacturer's conception of a physiological shoe, view taken from the sole. The heel is too far behind. It illustrates a well formed uppers spoiled by a bad heel which makes the shank too long. The breast of the heel should be as far forward as a line dropped perpendicularly from the anterior border of the internal malleolus. This would bring the breast forward to the dotted line. By making the heel full pitch behind, as in Fig. 2, the face of the heel would be no larger than at present. With a flexible shank this shoe would soon become broken and the heel tipped up behind.

modified to relieve the affliction, making this also a therapeutic shoe, and so on.

A physiological shoe for one man would not of necessity be beneficial for another man, because of difference of occupation; a shoe for a floor or pavement walker should have a higher or better cushioned heel than one for the man who walks upon the turf. A therapeutic shoe should conserve all the points of a physiological shoe that may be possible in treating the individual foot, and in any case there is no reason for constricting the toes. Let no



FIG. 4.—The long drag heel. The heel is too long, wide, high, flat, and hard. This style of heel is peculiar to numerous makes of trade shoes. Noting the position of this individual's heel in this shoe, it will not take much discernment to realize that the foot is confined at a great disadvantage. The exceeding width of the heel counter cannot be depicted in the x ray. Heel seat is very insecure and the toes are wedged. With all this length of heel, the breast is not far enough forward, according to the rule. If the counter and heel seat were built in conformity with the contour of the wearer's heel, much of the weight of the heel would be relieved.

normal function of the foot be restricted to the further weakening or damaging of the machine, though in many instances a departure may be necessary in several respects, changing the shoe materially. Seldom will these modifications from the physiological make the shoe unsightly or even particularly noticeable or heavy. It should be borne in mind that a shoe may have excellent lines physiologically and yet be ruined by a heel or a sole, or both, which tend to pronate or unbalance the foot. This is generally done by the heel being built higher

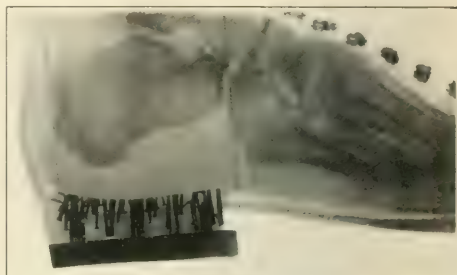


FIG. 5.—The writer's conception of the physiological heel seat. The heel could have been made a quarter of an inch shorter.

on the outer side, or the welt extended further on the outer side and cut away in the region of the ball. The same mechanical effect is produced by too long a heel or shank, the breast not set far enough under the arch (Fig. 3). The breast of the heel should be as far forward as a line dropped perpendicularly from the anterior border of the internal malleolus (Fig. 2, 5, 8, and 9). As remarked before in this series, other therapeutic measures are not to be excluded. Causative factors other than the shoe are to be kept in mind and diligently sought out. It is of primary importance to instruct the patient to walk so as to protect the foot, to direct the weight and body thrust away from the naturally weak or weakened part. Of no less importance is the building up of a strong muscular tone by systematic exercises especially designed to strengthen the foot structures. The foot must recover in a measure the loss of function and strength entailed by wearing bad shoes, before he can expect comfort.

In this paper it is intended to outline briefly 1, abnormal attitudes induced by shoes of improper or vicious shape; 2, conditions accentuated by improper shoes; 3, methods of modifying physiological shoes to improve or ameliorate these abnormal conditions; 4, the intimate relation of medical and

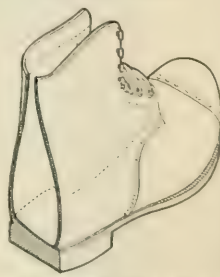


FIG. 6.—The trade's idea of a good heel seat. Note the almost square edge at union of counter and heel. The fibroconnective tissue cushion is squashed out into these square corners of long standing, the tubercles of the heel being denuded and made painful, giving rise to the dead tired feeling, and various painful conditions.

surgical diseases to the deformed, weak, or painful foot.

The anterior foot demands our first attention,

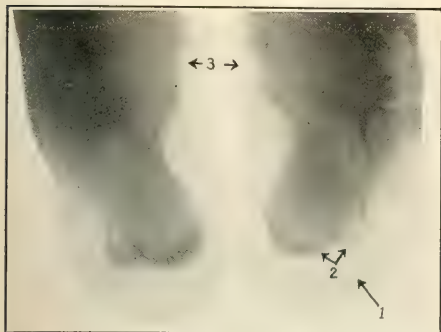


FIG. 7.—Radiograph of heels from behind. 1. Fatty fibroconnective tissue cushion. 2. Great and lesser tubercles seen in relief. 3. Subastragaloid joint and sustentaculum tali. This part of the foot, the heel, may be fitted snugly without impairment of function. The measure of this snug fitting counter should be taken with outside calipers. The plaster of Paris cast will not give this measurement, since most heels have been flattened by the flat heel seat. The heel can generally be compressed one quarter to one half inch. If the heel seat fits the heel of the wearer there will be no slipping from side to side and the motion from behind forward wedging the toes will be reduced to a minimum.

since hardly any one who has worn ordinary shoes approaches adolescence without deformity and some loss of function in these parts. The effect of high heels and the consequent digitigrade progression occurs more frequently than the much discussed longitudinal arch weakness, although this does not hold true in the clinic. The anterior foot impairment is apt to be more insidious in development. First in order of frequency will occur metatarsalgia, or Morton's disease, Morton's toe, or Morton's neuralgia, metatarsal marbles, sensitive anterior metatarsal arch, callosities, and bruised, inflamed sesamoid bones of the great toe, inflicted upon the anterior foot by the body thrust making pressure upon these parts in the unnatural position assumed in high heels, combined with the effect of the thin "turned" sole and "rocker" sole. The comparatively low, drag heel, with weak shank (1) gives the same mechanical strain, and is a very potent factor in producing these painful conditions.

A patient suffering with anterior metatarsal discomfort, complaining of numbness, burning sensations, cramps, etc., requires added toe room, a shoe built on physiological lines, permitting the great toe and all the toes to function (Fig. 14). The heel should be somewhat lower than usual (Fig. 10). It is manifest that the lower the heel of a shoe the

more weight will be borne upon the calcaneus. Therefore the heel should be one half to five eighths of an inch high, or lower, with a strong or reinforced sole and a metatarsal elevation or anterior heel one eighth to three eighths inch in thickness placed well behind the ball. The adjustment of this metatarsal heel or support requires skill and patience. If it is placed too far forward it will irritate; if too far back it will be inefficient. It may be too wide, extending to the outer side and impinging upon the distal extremity of the fifth metatarsal. Individuals suffering with this condition find it very agreeable to have a shoe with a counter and heel seat conforming to the natural heel to hold the heel cushion well under the calcaneus (Figs. 5, 8, and 9); otherwise the patient may acquire a sensitive heel in such a low heeled shoe, especially if compelled to stand or walk on stone floors. Such patients require a higher heel. Shoes for metatarsalgia should be built upon a last designed for a low heel. A shoe made upon the ordinary last requires a heel one and one quarter inches to two or more inches high; when the heel is lowered the toe must go up, resulting in a "rocker" sole. This misshaping of the shoe is accentuated by habitual loss of flexion of the toes—the clawed toe—which is almost constant in this

affection. The ability to wear the low heel with comfort, removing the weight from the metatarsal region, will imply a heel cord of normal length. When shortening is present it must be eliminated.

In aggravated cases of metatarsalgia

and in that type of the rigid, reversed anterior arch, the patient will find relief earlier and more satisfactorily by submitting to the simple operation described

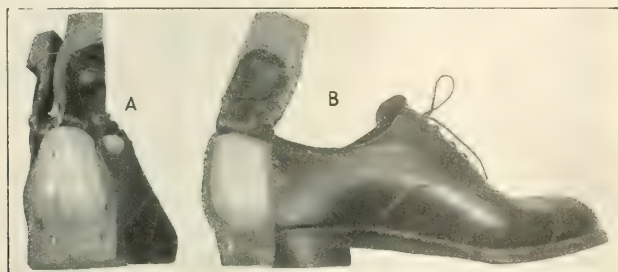


FIG. 8.—The writer's conception of the physiological heel seat. A, as viewed from behind. The bottom of the heel seat is rounded. There are no square corners into which the heel cushion may escape. B, side view.



FIG. 9.—Transverse view of left shoe and foot, in Fig. 10. Heel of the shoe is very good; breast well forward. This illustrates a well proportioned shoe for a case of metatarsalgia.

by Dr. Roland O. Meisenback (2). Retaining the high heel and narrow shoe, the pain, cramps, and general discomfort may be relieved sometimes by lifting the anterior arch of the foot with a brace, or strapping with zinc oxide plaster and incorporating a ingerlike pad of felt just posterior to the anterior metatarsal arch. This is a makeshift. Quite as distressing are the flattened heel cushion, the spur

heel, sensitive heel, sometimes designated as policeman's heel, and the dead tired feeling due to pressure produced by long standing in low, hard, flat heels with wide counters. This squashed heel cushion offers slight protection to the almost denuded internal and external tubercles of the calcaneus (Figs. 6 and 7). This flattened heel cushion, productive of sensitive heels and the dead tired feeling so frequently diagnosed as due to falling arch, may be relieved by the felt pocketed or physiological heel seat (1), preventing the squashing out and thinning of the fatty cushion under the bearing surface of the heel. This condition demands a heel one to two inches high, ac-

cording to the severity of the condition, of live rubber or live rubber covered with a lift of leather. Should there be any pronounced metatarsal symptoms, this modification of the shoe will not be agreeable. In this case the ordinary shoe may be given a thick piece of felt under the tender heel as a cushion, and a slip in counter to hold the heel snugly. Should the anterior metatarsal arch be weak or tender, with deep or hemorrhagic corns upon the heel and metatarsal at the same time, a felt insole one half inch thick will give relief. Again, all weight may be taken off the tender parts by making depressions in the felt insole.

Deformities so prevalent as not to be recognized as such are ingrowing nails, clubbed toes, over-riding toes (Fig. 11), inflamed great toe joint, bunions, hallux valgus, the result of the pressure of narrow, wedged toed shoes, the ordinary shoe, combined with the unphysiological stride and the toeing out of the foot induced by these shoes (Figs. 13 and 14). In this same category may be placed

corns, hammer toes, clawed toes, crumpled flexed toes, distorted bones, and atrophied muscles. The anterior foot is often crushed, par-boiled, characterless, with quite as much function and much resembling the nether extremity of the hermit crab. These conditions and the hallux rigidus are generally due to restricting pressure of short shoes and the wedging of the foot by slipping forward on the inclined plane made by the high heel and unstable heel seat. Mild deformities of the toes are to be met by plenty of toe room combined with a stable heel seat, and a snug waist, as outlined in the treatment of metatarsalgia. Due attention



FIG. 10. Custom made shoes are not always perfect. This model is considered to have a very neat toe, though imperfect from a physiological point of view. Note that the shadows of the rubber heels are well forward according to the rule.

must be paid to cultivating the intrinsic muscles of the foot, the toe flexors, by exercise.

Mild to severe bunions, hallux valgus deformities (Figs. 13 and 14), and inflamed great toe joint may be treated successfully by making the shoes snug posterior to the ball (Meyer) to support the bunion, with a straight inner vamp line to the end of the great toe. Give plenty of room over the distal extremity of the fifth metatarsal and little toe. Encourage the great toe to swing into a straight line with the centre of the heel by cultivating the habit of walking with toes straight to the front. The shoe should "break" in line with

the distal ends of the metatarsals. Figures 12 and 14 illustrate the working of a mechanical device for correcting hallux valgus. A further impulse to correction and relieving pressure of the great toe joints is given by elevating the sole one eighth to one fourth inch on the inner side, with a low heel, preventing weight and body thrust upon the anterior foot. To this end a snug and stable heel seat are highly desirable in this form of foot affliction. In the condition of hallux rigidus, the physiological shoe with a light steel spring in the sole prevents bending upward of the toe, the spring maintaining the straight sole. This will be efficient in relieving all but the most aggravated cases.

Occurring less frequently are the corns, bunions on the little toe and proximal and distal extremities of the fifth metatarsal produced by the narrow toe and the shoe "run over" to the outer side, or excessively canted heel and sole. A rebalancing of the shoe is here indicated. A rather unusual example illustrating the shoe's action in producing weakness, callosities and corns on the outer side of the foot seems worth recounting, as it conveys two lessons in exceptions. Usually the well worn shoe will reveal much regarding the foot of the wearer. When the shoe is worn off badly on the outer side of the heel and sole we expect to find a club foot.

CASE.—C. M., twelve years old; seen January 9, 1917; female; was the third child in a family of four children, all healthy. This child for several years had been accustomed to returning soon from play complaining of pain in her feet. She appeared well. With shoes on she walked with toes turned slightly outward and very much on the outer side of the heel and sole of the shoe. A one inch heel had been worn away three eighths of an inch on the

outer side and the sole worn through on the outer side, which apparently indicated a double club foot. Without shoes removed the child walked without pain; the feet were long, narrow, and flat; the great toe was very long, bent in valgus at distal joint, and clubbed; all the toes were clubbed. Circulation was poor; the skin was clammy; there was a plantar corn on the distal extremity of the fourth metatarsal and callosities on proximal extremity of fifth metatarsal; all muscular movements were weak; excursions were about one third normal; passive movements were normal.

A diagnosis of very weak, flat, flaccid feet, due to exceedingly short shoes with high heel, was made. Pain was due to the cramped position in the shoe; flaccidity was due to impaired motion; the feet had to assume the varus position, shortening them, to accommodate the short shoe.

When examining a foot many conditions are not recognized. I am convinced of this when looking back to my early study and the remarks of assistants today. I remember to this day the mental perturbation experienced when an excellent teacher requested me to explain what was to be seen in a pair of feet. The request implied that there was something to see. To me those feet were just bad, painful feet. If it is true that we see only that which we are looking for

or taught to see it is to be hoped that this paper may assist some in seeing more. A very prevalent condition is the short tendo Achillis, the muscle bound foot of Hibbs, due generally to constant wearing of high heels. The short tendo Achillis puts a strain upon the mediotarsal joint when walking in low heeled shoes or in bare feet. This should be corrected by stretching or by Doctor Hibbs's procedure, lengthening the tendon without severing.

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(To be concluded.)



FIG. 11. Custom made shoes made these feet. The right foot is in the custom made shoe. The bunion is given room and the great toe is pushed into valgus position.

REVERSIONARY PSEUDOBILE CANALICULI FORMATION IN THE CIRRHOTIC LIVER OF A VULPINE PHALANGER.

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It is common knowledge that there has long been a difference of opinion regarding the genesis of the bile ducts which we see so conspicuously in microscopic sections of the various cirrhoses of the liver. Passing the older textbook discussions and opinions, we find the following ideas current among modern pathologists: Adami and Nicholls (1) state that three modes of origin are possible: new ducts derived by proliferation of the original bile capillaries; bile capillaries that have persisted after de-



FIG. 1.—Darker parts are centres of lobules. The lighter are the reversionary peripheries. Fat globules in reverted and reverted cells appear as minute vacuoles, more numerous at left. Very low power.

struction of the lobules to which they belonged; or reversionary degeneration of liver cells. They state that on careful examination the new formed capillaries often resemble atrophic columns of liver cells more than bile capillaries because the cytoplasm of their component cells strikes a color with hematoxylin and eosin similar to that of normal liver parenchyma. "Such pseudocapillaries, therefore, probably represent columns of liver cells that have reverted to a more primitive condition." They favor, then, the reversionary theory.

McFarland (2) says that in cirrhosis of the liver the bile ducts "appear distinctly more numerous

than normal," in some cases suggesting adenoma. In explanation he suggests first that "some may have preexisted and become conspicuous by loss of hepatic cells," but that in extreme cases they are certainly more numerous than could ever have been normal. He also mentions the reversionary idea, that they represent isolated and atrophic columns of liver cells. He gives, in the third place, as the usual interpretation, that they are efforts at regeneration on the part of the bile ducts to compensate for atrophied liver parenchymal cells. He names the same three possibilities as Adami and Nicholls, but does not commit himself to any theory. Mallory (3) strikes a median position, stating that probably both true and apparent bile duct formations occur in alcoholic cirrhosis. He seems to prove the reversionary idea by citing the same kind of fat globules and hyaline material in the apparent bile ducts as appeared in the parenchymal cells. He speaks of these ducts as compressed liver cells. McCallum (4) in spite of Adami's and Mallory's statements, cuts the Gordian knot most boldly by saying that "everything goes to show that they are bile ducts for the greater part newly formed from the stumps of those which were left, and now growing to re-establish connection with the liver cells."

Kelly (5) seems to come nearest to the truth when he says: "Doubtless the great increase of these structures in cirrhosis is relative only, and due in small part to mutual approximation of already existing bile ducts occurring in consequence of loss of the liver tissue; but that most of them are newly formed is generally conceded and is quite apparent from their excessive number and the evidences of active proliferation (mitosis) that they commonly exhibit. Their origin has not been determined definitely for all cases. It seems quite certain that some, at least, of them result from proliferation of previously existing bile ducts; on the other hand, since they are found in a wide variety of disorders, such as all forms of cirrhosis, acute yellow atrophy, in the neighborhood of hydatid cysts, tubercles, gummas, etc., in other words, in diseases alike only in that they destroy liver tissue; since they differ from normal bile ducts in the absence or relative paucity of encircling elastic tissue; since they have been found by Ackermann and others to be directly continuous with liver cells; and since in cases in which the liver cells have been much destroyed they are found in large numbers in what may be interpreted as the remains of the skeleton of the lobule, we are quite warranted in the opinion that they may result from proliferation of the liver cells themselves, constituting in this event a reversion to a less highly specialized type of structure." The only part of Kelly's statement that is open to objection is the one in reference to Ackermann's findings. That the transition occurs is certain. The writer has seen it repeatedly, and a drawing of it is shown in Delafeld and Prudden's *Textbook of Pathology* (6) where these authors also lean to the reversionary theory. The objection lies in the interpretation. A little thought will show that the continuity *per se* simply indicates that the ducts and liver cords communicate; and no more that the new duct is derived from within the lobule

than from without. In either event they should be expected to effect a purposeful juncture.

Schmaus and Herxheimer (7) state that they are to be looked upon in part as atrophic bile ducts and that "the bile ducts grow in a regenerative manner in an attempt to construct a new liver cell, bespeak-

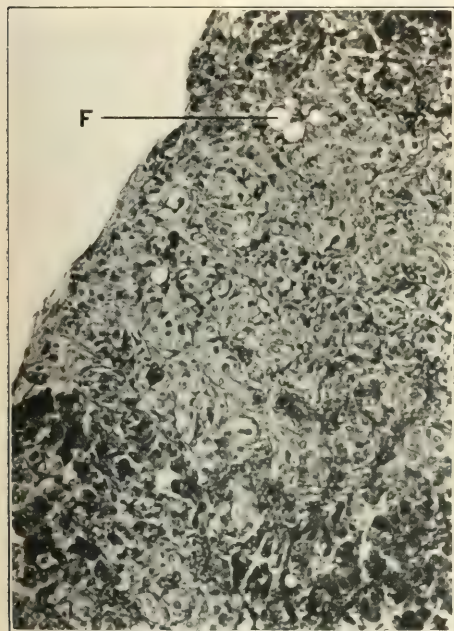


FIG. 2.—Showing differences in cytological detail between normal parenchymal cells (dark) and reversionary ones (pale). Fat globules in reverting and reverted cells at *f*. Medium magnification.

ing at the same time the history of the developmental origin of the liver cells." They do not mention the reversionary theory.

It is in the hope of adding yet another link to the chain of evidence supporting the reversionary theory that this finding is reported. The material was obtained from an autopsy on a vulpine phalanger (*Trichosurus vulpecula vulpecula*), a small marsupial from Australia which died at the Philadelphia Zoological Gardens (P. Z. G. 4054). Clinically it had shown no symptoms. At autopsy it was strongly jaundiced, the gallbladder was small, and bile ducts were notably dilated and filled by thick gelatinous bile. The liver was apparently below normal size; the whole animal weighed 1,249 grams, the liver fifty-three grams. This cannot be asserted with certainty, however, where given animals are posted at long time intervals. It was finely nodular like a fine morocco leather, rusty brown, jaundice yellow, and hard. The small size of the nodules and their uniformity in size stamps this anatomically, as a monolobular cirrhosis; and this, in conjunction with the marked jaundice and catarrhal choledochitis suggests that it is a hypertrophic one. The unsettled question of size is unfortunate; however, the

value of this case does not rest so much on this as on the microscopical findings.

Microscopical description of liver—sections stained by hematoxylin and eosin: The organic capsule and perilobular fibrous tissue are of about normal weight. Arteries, veins, and associated ducts are normal, the original major ductule being clearly recognizable in nearly every case as accompanying its proper artery and vein. There are no intermediate sized ducts between these vascular groups and the pseudobile canaliculi presently to be described in the lobule. In central parts of lobule the blood capillaries are very narrow and contain but few red blood cells, and Kupfer's cells are swollen and loaded with a coarse, granular, golden brown pigment. Parenchymal cells are likewise swollen, finely granular, vaguely outlined, and contain an abundance of very finely granular yellow pigment¹ and minute vacuoles. Some of the latter contain a diffuse greenish material, in which case their out-

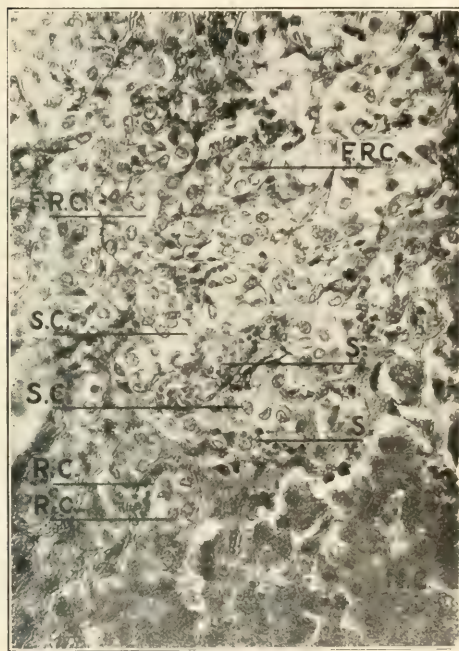


FIG. 3.—Taken at juncture of reverting and normal cells; *r. c.*, reverting cords; *f. r. c.*, fully reverted cords; *s. c.*, special cords, fully reverted, showing red blood cells on either side and therefore bounded by sinuses (*s*). Very high magnification.

lines are indefinite and their contents merge with the cytoplasm. Nuclei are on the whole in good condition—intact, vesicular, and rich in chromatin, and while occasional lysis is noted in extreme

¹Sections treated by Perl's test show much finely granular blue material in lobular centres and practically none in the reverted periphery. Coarser, blue green bile pigment is also found in centres not so abundantly as the blue, and contained, like the blue, in both parenchymal and Kupfer's cells. The small amounts of the blue (iron bearing), seen in the peripheral, reverted parts are, even though meager, valuable signs of the original parenchymal nature of these cells.

centric or lobules, the severer fragmentary and pycnotic changes are never shown. These appearances are maintained through about half the diameter of the lobule, no more markedly in peripheral than in central parts, when suddenly the type of cell changes generally to a ductal one. Out here a scanty fibrous framework appears between the cords, dense and homogeneous at the extreme periphery, loose and fibrillar toward the centre, in which the remnants of the original blood sinusoids appear only at more or less scattered intervals, and always in narrowed form, but numerous enough and in favorable places encircling cords in such a way as to leave no doubt as to their sinusoidal nature. They are certainly not newly formed capillaries accompanying the fibrous stroma. They are too broad and irregular in form for these. Furthermore, iron bearing pigment is seen in relation to some of them, contained in cells having the form of Kupfer's cells.

The "ductiform" cells here in the periphery are arranged in closely placed, uniform sized, rounded, compact alveoli, a little narrower than liver cords elsewhere, and generally showing no lumina. Where a lumen is shown it contains nothing or often a degenerate cell or group of cells still showing their original parenchymatous qualities, among which the presence of fat globules, huge and small, may be mentioned. The cells proper to the alveolus average a little smaller than the parenchymal ones, and generally a little larger than those of the original true ducts, and are not definitely cuboidal, but rather polygonal. Their cytoplasm is very pale, rarefied, elect little of the eosin tint, and are generally largely occupied by variously sized, poorly outlined, more or less confluent vacuoles which give them a reticular appearance. Another kind of vacuole is sometimes seen in addition, with sharper outline, so large at times as to give the "seal ring" appearance, and this in a cell a definite member of the pseudoduct; i. e., it is not between these ducts. Nuclei are larger and paler than either the original ductal or parenchymatous ones, round or ellipsoidal, and occupy a larger proportion of the cell than the latter. Their chromatin is finely granular, sparsely scattered and never filamentous. Occasionally, too, a cell or more is found lying between "ductiform" ones which still has the pink, granular cytoplasm of parenchymal cells, representing, evidently, original elements which have not as yet shared in the reversionary process. This extreme type shades suddenly to the parenchymatous as we pass from the extreme periphery and reach the midzone of the lobule, this with no intervening zone of special atrophy or necrosis. The nucleus becomes smaller, chromatin granules a little heavier and closer, and the cytoplasm more granular and dense. In selected places splendid examples of the transition from ductal to parenchymatous morphology can be traced in one and the same liver cord, as described by Ackerman. Mitotic figures were never found anywhere, nor signs of regeneration such as are seen so commonly in postinfectious biliary cirrhosis.

This picture is certainly unusual and perhaps unique in both comparative and human pathology.

Viewed broadly, it shows a moderate degeneration of lobular centres, while the peripheral halves are occupied by short cords or "ducts," whose cells are of ductal type, such "ducts" running even more irregularly than liver cords and separated by minimal amounts of fibrous tissue and compressed sinusoids. After a consideration of all these features the writer concludes, first, that the "ducts" are exactly in the original positions of liver cords. On this point there can be no doubt, for, 1, their arrangement is after the fashion of liver cords, i. e., they do not extend as directly from the periphery toward the centre as regenerating ducts, and they occur in short, closely placed segments; 2, isolated cells are found between ductiform ones which still retain parenchymal characteristics and which cannot be interpreted as ductiform elements which have attained a fuller differentiation because they show degenerative features rather than young vigorous ones; 3, they are often partially encircled by sinuses, strengthened by the relationship of pigment bearing cells of Kupfer. The sinuses clinch this question of position. It remains to show, second, that the cells in such cords are of parenchymal origin, and not regenerating ductal cells. This is a more difficult matter to prove conclusively, for, given the proper, nice adjustment between stimulus, degeneration, and reaction, we can theorize how in some atrophic or postinfectious process we might have the parenchyma in the periphery of the lobule destroyed without affecting its skeleton or notably fibrosing it, and that after this the peripheral bile ducts might furnish regenerating epithelium which poured into the spaces vacated by the disintegrated and absorbed parenchyma. This would give much the same picture described above, and it has taken much study of the sections and consideration before coming to the conclusion announced in the title, for it is well known that we do have these lobular skeletons in acute yellow atrophy, and that ducts regenerate into them. The negative evidence against this rationale in my case is, first, that there is no fibrosis commensurate with the grade of atrophy or destruction which must have preceded, and which is always seen, in fact, in such a class of cases. Indeed at times there is none whatsoever at the transition zone. Second, grossly the liver shows a perfectly uniform distribution of the process, whereas in acute atrophic cases it varies in different parts. It would be difficult finally to conceive of the nice adjustment supposed above, and such a perfect maintenance of the skeleton that the regenerating epithelium would be confined to definite cordal distribution. In short, the theory supposes too much, as viewed in the light of our present pathological knowledge. Direct, positive evidence that the cells are parenchymal is given by the presence of fat globules within cells which have ductal qualities, as reported in human cases by Mallory.

The writer believes, then, that the cells in this phalanger are beyond cavil reversionary parenchymal ones. What has caused the cirrhosis is another matter. Fox (8) has shown that cirrhosis is not infrequent among wild animals, and gastroenteritis is well known as the scourge of all zoological gardens. The viscid quality of the bile noted grossly

suggests at once an inflammatory factor operating by an ascending ductal route from the intestines, but this must be dismissed because microscopically the usual cellular infiltrates of this condition are lacking, and there is no special fibrous proliferation around the larger bile canaliculi. It is more probable that this is a portal cirrhosis, in which the absorbed intestinal products have had a subtle, selective action upon the peripheral lobular cells, inducing their reversion by unknown chemical or malnutritive processes, reduced their bulk a little, and that the modicum of fibrous tissue here is a replacement process. It cannot be pressure of the fibrous tissue that is causing the reversion, for areas of parenchymal cells are repeatedly seen showing beginning reversion where fibrous tissue has not yet reached them.

In relation to human cirrhosis, this case simply shows that it is the parenchymal liver cells of the phalanger only that can revert to ductal form. No one believes that the intestinal products of the phalanger are exactly the same chemically as those of the human, and no one will assert that the same factors always operate in similar diseases of man and lower animals; but we do know, both from observation at the zoological gardens and from outside sources, that the same principles govern disease in both, and therefore believe that this case assists Mallory, Kelly, and others in strengthening the reversionary theory. The features peculiar to this case, i. e., great numbers of "ducts," scantiness of fibrous tissue, uniformity of disposition, maintenance of cordal arrangement, etc., which separate it from human forms—the writer believes that differences in morphology are of more value in comparative pathology than similarities—are probably due to the fact that the cirrhotic substances generated in the intestines of this phalanger—simply had the proper, nice, chemical constitution to set up those reactions in its liver cells which in the end determine the morphological changes of reversion without at the same time stimulating notable fibrous tissue formation. In human cases, on the other hand, such substances affect the fibrous tissue, not to enter into the question of stimulative or replacement overgrowth, to such a degree as to hinder or prevent the recognition of the real nature of the parenchymal changes. Had the moiety of fibrous tissue in this animal's liver increased markedly and contracted, it is conceivable that it could, say in a year, have so compressed, distorted and atrophied these "ducts" that the picture would finally have been the same that we now commonly see in human atrophic cirrhosis and some of whose "ducts" we call ducts.

Reviewing and broadly comparing finally the findings in this case and those heretofore reported in human ones, we find that we can confirm Mallory's fat inclusions, and report a new and valuable feature consisting in the arrangement of the "ducts." Whereas before we depended for positive evidence mainly upon Ackerman's questionably valuable findings, and Mallory's and Adami's as to cell characteristics, now we have the additional and important one of maintenance in cords and preservation of sinuses to betray the real nature of the "ducts,"

and we have probably been thus fortunate because we have stumbled across an animal in which the etiological factor did not produce enough fibrous tissue to destroy this arrangement as it does in human cases.

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242 NORTH SIXTY-FIRST STREET.

TRICHINOSIS.

A Group of Twelve Cases.

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The outbreak of trichinosis which occurred at San Rafael, California, presents several interesting points. First, there were twelve cases in a family of thirteen; one member, the nine months old infant, escaped infection. Second, the diagnosis was for some time obscure, the attending physician having naturally regarded the cases as suspected typhoid fever. Third, although four of the twelve had severe symptoms, there were no deaths. Several members of the family had been sick for about a week before the county physician was called. Then, as they were in poor circumstances, he ordered the sick to the county hospital. During the following four days, the remaining members, with the exception of the infant, became ill, and were admitted to the same institution. Owing to the similarity of the early symptoms in this group of cases to typhoid fever, blood specimens were brought to the laboratory of the Bureau of Communicable Diseases for the Widal test. When a negative report was made on these specimens, the hospital authorities suggested that this bureau make an investigation to determine the nature of the infection.

In studying the hospital records of these cases it was noted that the temperature charts simulated those of typhoid fever; the temperature was high, ranging from 101° to 105° F. in all cases.

CASE I.—Mrs. A., the mother of the family, in describing her symptoms, stated that there had been neither headache nor backache, there had been no diarrhea, but there was weakness, stiffness, and pain in the limb muscles. She found it difficult to extend her legs and when doing so there was some pain. The leg muscles were found to be quite rigid; there was pain on active and passive motion, and this was marked on pressure, especially over the extensors of the foot and flexors of the thigh. The arms were but moderately involved. The muscle soreness and stiffness at about the tenth day of the illness were far more extensive than in typhoid fever. The eyelids were moderately swollen and there was a clean red tongue.

The symptoms in this group of cases ranged from a mild fever only, in the younger children, to a temperature of 105° to 106° F. with marked muscular involvement in the older ones.

CASE II.—J., age fourteen years, was typical of those most

severely affected. At the time of examination, about the twelfth day of illness, the temperature was 103.5° F., the pulse 87, and the respiration 38. There was moderate rigidity of almost the entire body; the face was flushed, eye bright, and eyelids edematous and slightly ecchymotic; the hands appeared swollen, and there were sordes of both mouth and nose. Speech was accompanied by pain and was somewhat interfered with, the voice being rough and gurgling. The tongue could be only partially protruded and the mouth was opened with difficulty. The neck muscles were noticeably involved, as was shown by the difficulty with which the head was turned from side to side. The arms were in a semiflexed position, and the legs were drawn up. When the left arm was drawn out by moderate force, there was pain in the biceps, the involvement of the left biceps being the less marked. The forearm flexors of the hand showed involvement, by the pain elicited on pressure, and this was more marked in the left than in the right; the grip of the right hand was almost normal and accompanied by only slight pain in the fingers, while that in the left was weak and accompanied by considerable pain. The intercostal muscles and diaphragm appeared somewhat involved, as indicated by moderate increase in respiratory rate. There was no demonstratory involvement of the back or abdominal muscles. The patient could draw up the legs with comparative ease, whereas extension was difficult and more painful; passive motion of the legs was painful, though less so than active motion. All the limb muscles were involved, as was shown by the pain elicited on pressure of the various muscle groups. Involvement, however, of the extensor groups appeared to be less than of the flexor groups. The extensiveness of the involvement of the muscle groups was indicated by the degree of rigidity, the flexion, and by pain on pressure. The reflex contractions of the muscles were wholly involuntary, and their similarity to those muscle group contractions in tetanus would indicate a like reflex mechanism in production. The knee reflexes were difficult to obtain, and on response were exaggerated. The patient walked with great difficulty and, owing to the marked rigidity of the flexors of the legs and the extensors of the feet, the knees were continuously extended forward and the heels were raised from the floor, the body being poised on the toes. (See Figs. 1 and 2.) The diagnosis reached by a study of this clinical picture was that of trichinosis.

The family diet had been limited for the most part to dried fish, potatoes, bread, and milk. It was ascertained, however, that a hog had been killed



FIG. 1.—Standing posture in trichinosis, Case II, J.; knees thrust, body poised on toes.

about three weeks prior to the onset of this sickness. A part of the pork had been made into sausage and, following their usual procedure, this had been hung by the stove for a period of eight days, for the purpose, as Mrs. A. explained, of blending the condiments used in seasoning. She usually cooked the three daily meals, but during her frequent absences, the children occasionally ate the sausage, and the only cooking they resorted to was a mere warming on the stove lids. Fur-

thermore, the two older boys admitted that they had eaten some of this raw. Specimens of the pork were obtained for laboratory examination; the gross specimens were suspicious of trichina, and on microscopical examination many muscle forms were found.

CASE III.—H., age sixteen years; temperature 102.5° F., pulse 92, respiration 42. The face was pinched, rigid, and sallow. The eyelids were swollen, the eyes bright, and the mental condition unclouded; sordes were marked. He was apprehensive, complained of pain and general discomfort, and asked why something was not done for him. His mental attitude might lead one to suspect mild hysteria. Of all those ill, this patient had the most marked symptoms of muscle involvement. The jaws could be opened to the extent of one half inch and the tongue extended only to the outer margins of the lips. Both of these acts required a great effort on the part of the patient and were accompanied by pain. His voice was high pitched and speech and deglutition were both painful and difficult. Apparently the entire voluntary musculature, including the neck and back muscles, was involved. The muscles were stiff, rigid, and boardlike. The muscle groups were markedly contracted; the more powerful of these caused the thighs to be flexed on the body and the legs on the thighs and the feet extended. It



FIG. 2.—Walking posture in trichinosis, Case II, J.; body poised on toes, feet spread apart.

required considerable effort, after mental concentration, for the patient to extend the legs. The arms were flexed and lay across the thorax. The back and leg muscles were moderately rigid. The head was thrown back and the back slightly bowed. The patient preferred to lie on the side on account of the pain in the neck and back muscles when lying flat. His condition was that of mild epistaxis. There was pain on pressure in practically all muscle groups. During the third week of illness the legs became markedly edematous, a condition which lasted for three weeks.

CASE IV.—M., age thirteen years. The face was somewhat sallow, eyes dull, but mental condition normal. There was pain in the throat when the tongue was extended, and speech and deglutition were accompanied by pain. The jaw muscles were contracted. The left arm and forearm were more involved than the right, the grip of the left hand being practically powerless, while that of the right was below normal. She complained of pain under both knees when the legs were extended. After considerable mental concentration, movements of the legs were executed with an abnormal degree of effort.

CASE V.—I., age ten years. Temperature 105° F., pulse 102, respiration 24. There was pallor of the skin; the cheeks were flushed; the eyelids were edematous, and slightly ecchymotic; sordes moderate, and severe epistaxis. The patient had delirium during the night, due doubtless to the high temperature. She had been sick for from ten to twelve days, and the muscles were as yet but slightly involved. The biceps were moderately contracted, and a gripping by the hand or drawing out of the arm produced some pain. The legs were somewhat more involved than the arms, being drawn up with the musculature moderately firm and painful on pressure.

In the remaining six children the severity of the symptoms lessened with the successive decreases in their respective ages. In the younger two there were mild fever, irritability, increased eosinophilia, and no demonstrable muscle pain. The mild symptoms in the younger children may be explained on the basis of the smaller amounts of sausage eaten, the degree of infection depending directly upon this factor. The illness in the case of Mr. A. was a moderate infection of about the same degree as that of Mrs. A. It is interesting to note that eosinophilia was most marked, forty-two per cent. in the patients who were in the early stages of muscle involvement; while only twelve per cent.

was found in the patient with the most extensive muscle invasion. In those with the muscle rigidity of a week or more the percentage ranged from twelve to twenty-four per cent. The average white cell blood count, taken about the twelfth day of illness, for the twelve patients is as follows: large mononuclear, 5; small mononuclear, 11; neutrophils, 41; eosinophiles, 26; basophiles, 0.1.

Differential diagnosis.—The extent of the invasion of the muscle groups was indicated by the degree of rigidity, the flexion, and the pain on pressure. The contractions were wholly involuntary and tonic in nature and were apparently due to a tetanuslike toxin. The reflexes, which were elicited after repeated attempts, were exaggerated. The various limb muscle groups were apparently quite uniformly involved. Even though the legs could be flexed on the thigh this did not mean that the flexor groups were more involved, for the greater involvement of the flexors would seem to be only apparent and not real. The combined reflex muscle contractions of the larger groups, the flexors, overpower the contractions of the smaller groups, the extensors. It was noted in these patients that after they had been standing for some time the reflex tonic contractions of the leg flexors and the foot extensors were finally broken, so that the legs became straight and the body rested on the heels.

The differential diagnosis between trichinosis and tetanus is not difficult, as in the latter disease the early involvement is unilateral, affecting first the muscle groups in the immediate vicinity of the focus infection, then the jaw muscles; only later is there a generalized tetany. On the other hand, it is to be noted that the muscle involvement in trichinosis appears first, ten days to two weeks after the onset of symptoms, in the legs, then in the arms, and finally, in severe cases, in the tongue and jaw muscles. This involvement is bilateral, though there may be a slight difference in degree. The reflexes in tetanus are easily elicited, whereas in trichinosis they are difficult to elicit, but when there is response it is, as in tetanus, exaggerated. The prodromal symptoms, the edema of the eyelids and face, the eosinophilia and the high temperature of trichinosis are absent in tetanus.

The differential diagnosis from typhoid is to be made by the early edema of the eyelids, conjunctivæ, and face, appearing later in the lower limbs, the clean red tongue; eosinophilia; the finding of trichinæ in the muscles, bloodstream, or stools; the dyspnea; the involuntary contractions; and an absence of a positive Widal test.

The early differential diagnosis of trichinosis depends chiefly on the edema of the eyelids, the eosinophilia, and a history of undercooked pork having been eaten. Many mild cases undoubtedly go unrecognized and the symptoms, edema and eosinophilia, recognized as pathognomonic, must be kept in mind for the diagnosis of isolated cases of trichinosis. In the group of cases here reported, sausage from one hog formed one of the chief articles of diet for a week or more; consequently the ingestion of repeated large doses, especially by the older members of the family, resulted in severe infections and well defined symptoms. A single

dose of the same sausage, or of any measly pork, inactive to the same degree, might produce symptoms so indefinite as to pass unrecognized.

Treatment.—The treatment consisted in mild purgation over a period of a couple of days, after which time a liberal dose of thymol was given followed by Epsom salts. As accurately as could be determined the thymol treatment was given about the twelfth day of illness. Inasmuch as the ingested trichina may survive in the intestine for as long as twenty-five days, their destruction and elimination should be accomplished as soon as a diagnosis is made. Following the thymol treatment there occurred in all cases a drop in the temperature curves almost to normal without a subsequent rise. Whether or not this was due to a destruction and expulsion of the worms by the thymol cannot be definitely stated. It would appear, however, from the uniformity of results in permanently lowering the temperature in all cases, that the thymol treatment was of benefit. If this benefit resulted from a destruction of the intestinal forms of trichina one would have to conclude that these, rather than the young migrating forms, were responsible for the temperature. Following the thymol treatment stool specimens from all patients were examined, but no trichinæ were found.

SUMMARY.

1. There were twelve cases of trichinosis in a family of thirteen members, the nursing baby being the only one not affected.
2. The infection was due to eating partially cooked pork, and in two cases to eating uncooked sausage.
3. The degree of illness was most severe in the older children who had unrestricted access to the sausage.
4. The symptoms of muscle involvement were typical in those severely affected.
5. Eosinophilia was most pronounced in those in the early stages of muscle involvement.
6. In the gross the pork was suspicious of trichinosis, and on microscopical investigation trichinæ were found.

Value of the Wassermann Reaction.—Douglas Symmers, Charles G. Darlington, and Helen Bittman (*Journal A. M. A.*, February 2, 1918) point out that the value of the Wassermann reaction has been called into question by a number of observers. An effort was therefore made to compare the results of this reaction, as carried out with both cholesterin and crude alcoholic antigens, with the results of post mortem examinations. Every precaution was taken to make the observations as accurate as possible and due allowances were made for possible errors. The remaining ninety-nine cases, after excluding all negative at post mortem and to Wassermann, gave the following results: Among the cases in which the characteristic anatomical evidences of syphilis were present at necropsy the Wassermann reaction was found to be negative during life in from thirty-one to fifty-six per cent., depending on the antigen employed. On the other hand, the reaction was positive in at least thirty per cent. of cases in which no anatomical lesions of syphilis were found post mortem.

COMMON SENSE IN THE PREVENTION AND CORRECTION OF SOME PARALYTIC DEFORMITIES.

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Without doubt one of the important problems in infantile paralysis is the treatment of deformities. Orthopedically speaking, both the prevention and, when deformity has occurred, the correction are implied.

We have had under observation at this clinic two

and 2) which seemed at first to be efficient. Upon closer study this did not prove to be the case. The brace consists of a leather band about six inches wide, which reaches halfway across the chest wall both anterior and posterior. Attached to the edges of this leather band are two canvas strips which continue the circuit of the chest. These canvas pieces are held together by means of a lacing. Incorporated in the leather band is a steel bar which runs as far as the axilla and is then bent at right angles to support the paralyzed arm. The lower edge of the brace when applied reaches the tenth rib.



FIG. 1.—Note posture and attempt of child to rest lower edge of brace on iliac crest.



FIG. 2.—Note posture.



FIG. 3.—Postural scoliosis due to inefficient brace.

classes: patients having deltoid paralysis and those having talipes equinus. For the prevention of shoulder deformity a type of brace was used (Figs. 1

In order to hold the apparatus in position, tight lacing is necessary. During expiration the chest wall contracts, proves an inefficient support for the brace, and naturally, the apparatus slips down. In so doing it pulls the arm down with it. To remedy this, the advice has been to tighten the canvas straps. Then again, as will be seen in the photographs, the child assumes a peculiar posture. The chest wall, being an inefficient anchor for the brace, gives, and in so doing the shoulder on that side drops, causing a postural curve of the spine with the concavity on the side of the paralyzed deltoid (Fig. 3). It will also be seen that the patient makes an attempt to secure a fixed point and accomplishes this end by tilting the pelvis upward on the side of the brace until the lower edge of the appliance rests on the crest of the ilium.

In order to overcome these deficiencies a brace was devised which has proved highly efficient. The crests of the ilia were taken as fixed points. A celluloid belt was made from a plaster mould stretching from a point about one, to two inches in front of the anterosuperior spine across the back and to a corresponding point in front of the opposite anterosuperior spine. This leaves the abdomen entirely exposed. A thin steel band is attached to the lower part of the celluloid belt to serve as anchor for the steel bars which run up either side. One is short and reaches the axilla. The other, on side of paralysis, is longer and runs up to the axilla where



FIG. 4.—New brace—anterior view—note comfort of patient.

it is bent at right angles in order to serve as a support for the arm proper. Across the back a thin band of steel connects the upper ends of the upright bars. Attached also to the upper ends are two crutches which encircle the axilla and encroach

the other can be overcome by a few minutes' exercise daily.

In the treatment of talipes equinus aluminum



FIG. 5.—Posterior view.

about one and one half inches on the chest, both anterior and posterior. The forward ends do not touch the chest but are about three eighths of an inch away. The arm rests on a shelf to which it is held by means of narrow straps. At the present time, instead of a shelf a bowl is made in which the arm rests, doing away with any sort of constriction. There is also a ratchet on one side and a slot joint on the other by means of which the brace can be lengthened as the child grows.

The advantages of this appliance over the other are: 1. It is more comfortable. 2. It is highly efficient. 3. It prevents a spinal curvature. 4. It does not constrict the chest wall. The disadvantages are: 1. It is heavier. 2. It does not allow spinal movement. The fact that the brace is heavier is of minor importance, as the weight is on the pelvis and not on the shoulder;



FIG. 6.—Note extreme amount of equinus before treatment.



FIG. 7.—Foot after ten weeks treatment.

splints, wire splints, and plaster casts are advised. All of these have been tried and found inefficient. Especially in cases where the gastrocnemius and soleus have remained normal, was the reduction ex-



FIG. 8.—Foot strapped. Note adhesive "bridge"; also difference in angles between foot and leg before (Fig. 7) and after strapping.

ceedingly difficult. At the clinic best results were obtained by means of adhesive strapping applied as follows: A two inch bandage is applied from the toes to the popliteal space. The leg is then flexed on the thigh and the foot is forcibly flexed on the leg.

A strip of adhesive, one inch wide, is applied at the head of the metatarsal bone of the little toe, across the anterior arch and strapped to the posterior portion of the upper end of the calf on the side of the little toe. Another is started at the head of the metatarsal bone of the big toe across the anterior arch and strapped to the posterior portion of the up-



FIG. 9.—Anterior view of strapped foot showing how straps cross each other.

end of the calf on the side of the big toe. Another strip is run around the calf to hold the other two pieces in place. The leg is then extended and kept in that position by means of a short posterior splint. This method has been found most efficacious, and has never failed to produce results.

In order to see to what extent this method could be used, a case of equinus, of four years' duration was experimented upon. Fig. 6 shows the child before treatment was instituted. Fig. 7 shows the result of ten weeks strapping. Straps are applied, following each treatment. The most important advantage of this method is, that it makes tenotomy of the tendo Achillis unnecessary, and also prevents some cases of ununited tendo Achillis following tenotomy.

1444 BRYANT AVENUE.

BRAIN ABSCESS CAUSED BY CHRONIC SUPPURATIVE OTITIS.

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Three cases of cerebral abscess of otitic origin, which came to the Brooklyn Eye and Ear Hospital within the past few months demonstrate the paucity of symptoms presenting in this serious complication of middle ear suppuration. The only constant symptom is the chronic ear discharge. In none of the cases was there noticeable slowing of the pulse. Pus was present in the ear, and the history was elicited from the patient, of its previous long continuance, together with recurring attacks of pain in the ear or in the corresponding side of the head, in all three of the cases.

Two of the cases were abscesses of the left temporosphenoidal lobe. In one of these a typical amnesic, sensory aphasia appeared. In the other, while the report of the house surgeon seemed to justify the conclusion that there was, at the time he saw the patient at her own home, a true loss of memory for words, when seen subsequently by me the disinclination to talk was certainly more an inertia, a disinclination to make any effort either mental or physical, the condition typical of advanced brain abscess. In the case of rightsided abscess in a righthanded man there was no difficulty of speech or in naming objects correctly. The two patients who recovered have dry ears for the first time since childhood.

CASE I.—*Chronic middle ear suppuration; necrosis of tegmen tympani et atrii; abscess of adjacent temporal lobe; operation; recovery.* Mrs. Rosie M., thirty-seven years old, came to the clinic January 4th, complaining of feeling ill for five weeks, with earache and pain in left side of the face and head. There was no tenderness of the mastoid. A slight amount of thin, bad smelling discharge could be seen issuing from a good sized attic perforation. Granulations were absent from the margins of the perforation, none being visible by way of the meatus. We learned that the discharge had existed since childhood, that no special attention had been given the ear, that she had been taught that the discharge was a good thing and only to be a matter of concern if it ceased to run. Her memory had been poor for five weeks past. She miscalled the names of objects. Thus she called a watch a bell, answering without delay, but realizing at once that she had miscalled the object. She explained her state by saying that her head felt confused and that she could not remem-

ber the names of many things she knew well. Wassermann reaction was negative.

Operation, January 5th. The bone of the mastoid was of the hard, dense type characteristic of chronic suppuration, with nearly an entire absence of cells, or bone spaces. The roof of the antrum and tympanic cavity was necrosed away, the dura was perforated, the gap extending into the brain substance directly above the tegmen of the tympanum and antrum for three quarters of an inch, fairly well limited by a wall of granulation tissue deposit. A drain was introduced and the wound packed loosely and wide open. After operation she had headache; she was not nauseated and there was no disturbance of vision or pupillary reflexes. A desire to sleep was marked for a few days. Her aphasia continued but about one week, her memory for objects rapidly improving. Her headaches diminished gradually. She was allowed to sit up at the end of the third week and to go home at the end of the fourth week, but she was advised to rest in bed the greater part of the day. Her ear was dry four weeks after the operation, this being the first time in her memory that it had been so. The wound was healed at the end of the eleventh week, some drainage of serous fluid continuing at the depressed site of the brain abscess up to this time, this being the last spot to heal at the end of the eleventh week. This patient has remained well for a year and a half, and recently reported at the hospital to say she had given birth to a child without mishap.

CASE II.—*Suppurative otitis; mastoiditis; necrosis of tegmen tympani; abscess of temporosphenoidal lobe of cerebrum; two operations; death from extension of abscess, supposed rupture of abscess into fourth ventricle.* Mrs. Hannah K., fifty-four years of age, inclined to stoutness, called at the clinic on April 27th with rather indefinite pain, chiefly in the occipital region, radiating to the mastoid region of both sides. She had a purulent discharge from the nose. Both drum membranes showed the cicatricial deposits of old suppuration while from the left ear there appeared a thin, bad smelling discharge from an attic perforation of the left drum membrane. There was no tenderness of the mastoid, and this absence of pain or tenderness to pressure continued throughout. The discharge from the nose was found to have its origin from the ostium of the left sphenoidal cavity. Headaches were worse in the mornings, and on account of the discharge continuing from the sphenoid it was determined to drain the sphenoid through its anterior wall. This was done under local anesthesia, and all discharge from the nose ceased within ten days thereafter. The discharge from the ear varied rather markedly, diminishing for a few days and then increasing. About the time the discharge from the nose ceased a lymph node at the angle of the jaw became enlarged. She had some headache, however, though not as much as when first seen; she seemed to be losing weight and complained that she got tired easily. Though her hand grip was not very strong there was not noticed the typical loss of grip of the hand opposite the affected side so commonly noticed in temporosphenoidal abscesses of large size. A certain slight hesitation of speech was noticeable, though neither at this time nor later could a true sensory aphasia be demonstrated. There was no choked disc or optic neuritis. Wassermann reaction was negative.

Operation was recommended and performed July 11th, at which the tegmen antri was found necrosed away and a small ragged perforation existed in the dura just over the tegmen from which pus was oozing. No chiestoma appeared in the brain abscess, mastoid antrum, or ear. A large bone cell at the tip of the mastoid was filled with pus, its inner wall necrotic and broken through into the diastrophic fossa—Bezold's type of mastoiditis. The tip of the mastoid was removed and a separation of the tissues was made from this deep abscess through the side of the neck and skin and a rubber tube inserted. The brain abscess cavity was held open with a gauze cigarette drain with a large quantity of fluffy gauze laid over this. The patient did well for a time and during her stay in the hospital progressed apparently favorably, but several weeks later the house surgeon who had been dressing the case was summoned to the patient's house to see her. She was then presenting symptoms of retained secretion and was extremely weak, partly delirious, pulse slow and weak. The house surgeon got her into the hospital where we again evacuated pus in greater quantity than before apparently

both from the original abscess and certainly from another more deeply situated than the first. She again rallied and the next day appeared bright and cheerful. The improvement, however, lasted only a few days; she continued to grow weaker and her death occurred a few hours after a sudden collapse, with accession of temperature, restlessness, delirium, and coma on September 15th.

A peculiarity about this case was the resemblance to true aphasia exhibited by the patient, which as the abscess was on the left side we were at first inclined to consider it. It was merely that the patient was slow in cerebral processes and unless she was sufficiently roused she would not make sufficient effort to answer intelligently. This was made clear in that, very late in her illness, at sharp urgent questioning, she could name familiar objects.

CASE III.—*Brain abscess with labyrinthine irritation following chronic middle ear suppuration; operation; recovery.* Tony M., twenty-seven years of age, well nourished and muscular, came to the clinic of the Brooklyn Eye and Ear Hospital, December 26, 1916. The purulent discharge from the right ear had existed since childhood. He now complained of having had pain in the affected ear for two weeks. It appears from questioning him, however, that for several years he has suffered from earache every winter. Last winter he gave up an outdoor job for one in a factory thinking this less exposing, and believed he had less pain last winter as a consequence. This winter he has had more or less pain constantly since the middle of November. He had never had pains so severe as during this last attack. The pain was his only complaint, but it was observed that his gait was slightly staggering and when questioned he said he had dizziness at times. The mastoid was but slightly, if at all, tender. The hearing in the affected ear was poor but he was able to understand conversation when standing close at hand, with the Bárány noise apparatus at the unaffected ear. He could touch the end of his nose with the forefinger of either hand promptly and accurately. On January 2, 1917, he exhibited a spontaneous nystagmus. This was not regularly directed but was continuous during the clinical examination; his stagger was also noticeable. There was no spontaneous pointing. The pain was better and he declined operation at this time. His blood count showed normal, viz., white blood cells, 7,100; polymorphs, sixty-nine per cent.; lymphocytes, twenty-seven; mononuclears, two; eosinophiles, one; transitional, one. The pulse was slow and full but not significantly so. Wassermann reaction was negative.

Severe pain returned and he willingly went to a bed in the hospital, January 8, 1917. Pulse, 60. Operation, January 9th. The pus in the antrum, when opened, escaped as from under much pressure and in large quantity. The cavity of the mastoid antrum was found to be a part of the brain abscess, the cavity extending through the bony roof and upward and backward into the brain substance about an inch beyond the level of the antral roof. The brain abscess cavity seemed to be firmly walled off from the surrounding brain substance by previous hyperplastic inflammation. The malleus, much necrosed, was found in the middle ear cavity surrounded by a dense mass of granulation tissue. It was believed to have been exerting pressure on the foot plate and to have been the cause of the nystagmus. The cartilaginous canal was incised along its length and the mastoid wound and external meatus were left open so as to give the freest access to the abscess cavity for further dressings or possible subsequent operation. On the third day after operation the temperature rose to 102.4° F. His first dressing was now renewed with a warm wet chloride dressing and the temperature subsided. Subsequently to operation the pulse was not lower than 72, and neither nystagmus nor vertigo at any time subsequent to operation, but there was occasional complaint of headache in the right temporal region for six weeks after operation. The man was kept in bed in the hospital for seven weeks; ear was then dry. His wound was entirely healed in eight weeks. The ear was healed, having previously constantly discharged from early childhood up to seven weeks after operation.

425 CLINTON AVENUE, BROOKLYN.

TWO STAGE PROSTATECTOMY.

Twenty Consecutive Cases Without a Fatality.

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There has been perhaps no more encouraging development of surgery in recent years than the remarkable lowering of the mortality of operations for the removal of the prostate. Instead of its former reputation of being one of the most serious and dangerous operations, prostatectomy is now a comparatively safe procedure when performed with due precautions. The early high mortality has been reduced to a point where at the present time, when properly safeguarded, the operation is attended by very little risk. This favorable change is almost solely due to the recognition of the necessity of a careful preparation of the patient for operation. Indeed the preliminary preparation is undoubtedly the most important factor in the whole surgical management. It is of much greater importance than the selection of the particular type of operation, perineal or suprapubic. In twenty consecutive prostatectomies performed by the two stage method the writer has not had a single fatality. Although this number is not large, it seems significant as indicating the safety of the procedure, especially in view of the fact that several of the cases were bad surgical risks. Only as recently as 1911, Rovsing (1) reported twenty-five prostatectomies performed by himself with a mortality of sixteen per cent. Page (2) in twenty-six cases operated on in four London hospitals from 1906 to 1910 quotes a mortality of 21.5 per cent. Deaver (3) in 1905 collected from the literature the records of 186 cases of suprapubic prostatectomy with a mortality of 10.75 per cent. The more recent records, however, of Freyer, Young, Judd, and others show a much lower mortality, varying from three to 5.5 per cent. These improved records are undoubtedly to be ascribed to a more intelligent preparation of the patients for operation.

Most of the fatalities after prostatectomy are due to impairment of renal function and to infection of the bladder and its surrounding tissues. "Often in addition to these complications prostatic subjects are victims of marked arteriosclerosis and myocardial degeneration. As Deaver (4) has said: "The vital organs show the scars of the battle of a life almost spent." Too much emphasis, therefore, cannot be given to the necessity of a careful examination and of the exercise of a wise judgment as to when rather than how the prostate shall be removed. Under no conditions is prostatectomy an emergency operation, and there is no longer any justification of the former rough and ready methods of proceeding to undertake the operation without any more preliminary study and preparation of the patient than would be given to the usual healthy man with a hernia.

Realizing that most of the fatalities are due to impaired renal function and to severe bladder infection, it is highly important that in the examination of every prostatic subject special emphasis should be given to these points. In the author's hands the phenolsulphonephthalein test of Row-

and gravity (5) has proved of great value in determining the operability of this kind of cases, although other urinary factors, such as specific gravity, presence of casts, etc., must be considered. Patients who show a greatly delayed appearance of the substance, beyond twenty minutes after hypodermic administration of the drug, and who secrete only thirty-five to forty per cent. or less of it in two hours have proved invariably to be bad risks. In determining the degree of cystitis, one should not be content merely with noting the quantity of pus. The examination should also include the making of bacteriological cultures. Examination with the cystoscope, while not always imperative, is nevertheless an important step in the routine because it reveals more accurately the nature of the prostatic hypertrophy, the presence of diverticula or calculi; the suspicion of malignancy, etc. But the fact should not be lost sight of that even so comparatively simple a procedure as a cystoscopic examination occasionally leads to disastrous results in a prostatic subject.

For the purpose of improving renal function the all important principles are to remove back pressure on the kidneys from an overdistended bladder and to cure if possible, or at least to diminish, the bladder infection. Crabtree and Cabot (6) consider the blood stream to be the most frequent source of infection. Regardless of whether the kidney impairment is due to an ascending or a hematogenous infection from the bladder, the fact remains that one of the most important indications in the pre-operative handling of these patients is the removal of the original infection. To carry out these principles it is obvious that drainage must be instituted, for improper drainage caused by the prostatic obstruction has caused the complications. Adequate drainage can be carried out only in one of two ways: 1, by frequent or permanent use of the catheter over a period of time, and 2, by establishing artificial drainage through a preliminary cystostomy. Of these two methods it is obvious that cystostomy, when properly done, certainly insures better drainage than occasional catheterizations and probably as good drainage as a permanent catheter in the urethra. Furthermore, a permanent catheter is so painful to many patients that it can not be tolerated. The only real disadvantages to a preliminary cystostomy are that it necessitates two operations and that the later operation for the removal of the prostate is perhaps a little more difficult technically. Neither of these objections is important. Suprapubic cystostomy is so simple, especially with local anesthesia, that it hardly deserves to be considered as an operation in itself, and the technical difficulties of the second operation are not sufficiently greater than those of a primary prostatectomy to constitute a serious objection to the method. In the writer's opinion the two stage operation has abundantly justified itself in the results obtained.

Our procedure with prostatic subjects is invariably to perform a two stage operation, 1, if there is an associated cystitis; 2, if the specific gravity of the urine is persistently low—under 1010—and if the phenolsulphonephthalein test shows marked delay in elimination of the dye as, e. g., only forty

per cent. or less within two hours after hypodermic injection; or, 3, if the patient seems to be a poor risk for any other reason, as advanced age, marked arteriosclerosis, etc. If, however, there is no cystitis, and if the renal elimination and the general health are good, we remove the prostate at one sitting.

After the preliminary suprapubic cystostomy the patient is encouraged to get out of bed as soon as he feels able, usually on about the third day. He is also encouraged to drink water freely. If there is evidence of a threatened acidosis as determined by the carbon dioxide tension of the alveolar air or of the blood plasma, or by marked shortness of breath, care is taken to see that the patient gets alkali, usually as sodium bicarbonate, and sufficient carbohydrate to improve the symptoms. The drainage is carried into a bottle which the patient wears strapped to the side of his abdomen or thigh, which thereby avoids keeping him soaked in his urine. This drainage is maintained as long as is necessary to insure a marked improvement in the renal elimination, the cystitis, and the general clinical symptoms. In one case it was maintained for eight weeks. The cystostomy is nearly always performed under novocaine anesthesia. If the patient is a poor subject for local anesthesia and complains of pain, the procedure is finished under nitrous oxide and oxygen. For the second stage, the prostatectomy, the anesthetic which we use is usually nitrous oxide and oxygen. Occasionally we use ether, and we have also performed a few prostatectomies with local anesthesia. In our opinion chloroform should never be used. In a former publication (7) we have shown that chloroform is split up in the body in such a way that free hydrochloric acid is formed from it. Accordingly, therefore, whenever one administers chloroform he is in fact administering hydrochloric acid to the tissues. We therefore strongly dissent from the view of Deaver that chloroform should be used in prostatectomy operations on patients who have bronchitis. There is no evidence to substantiate the popular belief that ether is more likely to induce pneumonia than chloroform. That idea is a relic of the time, when, owing to improper manufacturing methods, much of the ether contained sulphuric acid. As a matter of fact, as indicated above, since whenever we give chloroform we actually administer hydrochloric acid to the cells of the body, there is more danger of untoward results after chloroform than after ether.

The following are typical illustrative cases, some of which present unusual features:

CASE 1.—A retired farmer, aged eighty-six years, showing marked senility; entered the hospital because of acute retention of urine with the bladder greatly distended. He had not passed urine for twenty-four hours. He had a history of prostatic symptoms extending over a period of about ten years. He did not use a catheter himself but had been compelled repeatedly to have urine withdrawn by his physician. Examination through the rectum revealed a plainly hypertrophied prostate, which was evidently not malignant. Marked senility and arteriosclerosis were evident. The systolic blood pressure was 185. There was nothing else of importance in the examination. Catheterization was difficult; therefore a suprapubic incision was made into the bladder with novocaine anesthesia, and tubular drainage was established. There was no appreciable shock following the operation. Three days later a

functional test with phenolsulphonephthalein showed the first appearance of the dye in fifteen minutes after injecting it hypodermically; and at the end of two hours only forty per cent. had been eliminated. The urine was markedly alkaline and contained much pus. Cultures showed a pure culture of *Bacillus mucosus capsulatus*. An unusual feature of this case was that the skin adjacent to the bladder incision became infected with the development of from twelve to fifteen discrete ulcers, all of which had a characteristic appearance. They were circular in outline from two to five millimetres in diameter, with shallow edges with little induration, and a floor covered with grayish necrotic tissue which was stringy and distinctly mucoid in appearance. Cultures from this necrotic tissue yielded a pure growth of *Bacillus mucosus capsulatus*. These ulcers were painful and annoying. After persisting for three weeks with practically no change in spite of applications at various times of iodine, alcohol, bichloride, and boric acid, they finally yielded to a single cauterization with stick silver nitrate and promptly healed. After four weeks of drainage, the urine was free from pus and a functional phthalein test showed an initial appearance in ten minutes and an elimination of sixty per cent. within two hours. The patient had been up and walking around after the third day, and his general symptoms were much improved. Accordingly it was felt safe to proceed with the prostatectomy which was performed in five minutes' time with light ether anesthesia through the original suprapubic cystostomy opening. A large adenomatous prostate, weighing sixty-eight grams, was removed, which microscopically showed no evidence of malignancy. Following the operation the patient's general condition was excellent. On the following day he ate three regular meals, and on the fifth day he was allowed to sit up in a chair. The tube was removed on the fifth day, and two days later urine was evacuated through the urethra. Two and one half weeks after the operation he was discharged with the wound entirely closed. He was able to hold his urine for from four to six hours at a time.

CASE II.—A man, aged sixty-five years, with marked sepsis and high grade arteriosclerosis had had no occupation for past two years because of physical disability. He was brought to the hospital in the ambulance with a history of great suffering for the past two weeks because of nearly constant tenesmus and desire to urinate but with ability to urinate only a few drops at a time with great difficulty. He had been bedridden during most of this time and was exhausted from lack of sleep. There was a history of prostatic symptoms for eight years with frequent use of a catheter by a physician and frequent passing of milky, ammoniacal urine. The patient stated that he thought he had lost about thirty pounds in weight during the last six months. His temperature on admission was 102.4°F.; pulse, 120; systolic blood pressure, 205. Radial arteries were like pipe stems and there was marked arcus senilis. Hemoglobin seventy per cent. (Dare); leucocytes, 14,000. Rectal examination revealed a large, moderately firm, and tender prostate with no gross evidence of malignancy. By catheterization, which was very painful, 500 c.c. of urine were removed. The urine was greenish from the taking of methylene blue tablets and contained much pus from which the colon bacillus was isolated in pure culture. It was strongly alkaline. Because of the desirability of giving the patient immediate relief from his tenesmus, a suprapubic incision was made with novocaine anesthesia and tubular drainage established. There was a slight amount of shock following the operation but after about an hour he went to sleep and slept continuously for four hours, the longest continuous sleep which he said he had had for two weeks. After three weeks of drainage his blood pressure had come down from 205 to 160, the urine was practically free from pus, and a phthalein test showed sixty per cent. elimination in two hours. The temperature had been normal for two weeks. The patient was now regarded as a safe risk for the prostatectomy, and accordingly it was quickly performed with light ether anesthesia in six minutes. There was no appreciable shock following the operation. Recovery was uneventful and the patient was discharged three weeks after the operation with the wound healed and continence sufficiently well established to enable him to retain his urine for four hours at a time. Microscopical examination revealed a simple adenoma of the prostate.

Six months later he reported that he had gained thirty pounds in weight, felt twenty years younger and was able to hold his urine all night and then void it normally.

CASE III.—A patient aged sixty-two years, with prostatic obstruction complicated with a carcinoma of the fundus of the bladder entered the hospital complaining of passing very bloody urine almost continuously for the last three months and of frequent attacks of severe tenesmus and difficulty in urination. At intervals he was compelled to urinate as often as every hour. He had been treating himself during this time with various kinds of proprietary medicines. There had been symptoms of moderate urinary obstruction present for about eight years, characterized chiefly by difficulty in starting the flow of urine. He had been catheterized only once about ten days ago. There had been no marked loss of weight. Examination revealed rather marked signs of senility, such as a well marked arcus senilis, marked arteriosclerosis, etc. A specimen of urine obtained by voluntary micturition was bright red in color from the presence of a large amount of blood, and there were numerous small clots in it. The urine was alkaline in reaction. Catheterization immediately afterward resulted in the withdrawal of about twenty c. c. of foul smelling, bloody urine. The systolic blood pressure was 165. Hemoglobin, 70 (Dare); leucocytes, 10,200; temperature, 99° F. Rectal examination revealed a soft moderately enlarged prostate which was also somewhat tender. A cystoscopic examination was attempted by Dr. M. J. Fitzpatrick, but was abandoned because the presence of the blood rendered a good vision of the bladder impossible. A tentative diagnosis was made of hypertrophy of the prostate and a papilloma of the bladder. An exploratory operation on the bladder was advised and consented to. A suprapubic incision was made under ether anesthesia and an elevated platealike, soft carcinoma was found on the right lateral wall of the fundus of the bladder. This tumor was about two centimetres in its longest diameter and was elevated from the bladder wall to a distance of about one centimetre. The prostate was found to have a large middle lobe which projected over the urethral opening. The carcinoma was removed by resecting a portion of the bladder widely around the base of the tumor, cauterizing the edges with the actual cautery and closing the defect with No. 3 catgut. A tube was inserted into the bladder and closure made in the usual way in cases of suprapubic cystostomy. Microscopic examination of the tumor confirmed the diagnosis of carcinoma. Convalescence from the operation was uneventful and there was no blood in the urine after the second day. Two weeks later the phthalein test showed an elimination of sixty per cent. in two hours, and the enucleation of the prostate was performed quickly through the suprapubic opening with the aid of nitrous oxide and ether anesthesia. The prostate microscopically was found to be an adenoma. Three weeks later the patient was discharged from the hospital with the wound completely healed and with continence sufficiently established to allow him to go from four to six hours without urinating. At the time of this writing, seven months after the operation, there has been no return of any of the former symptoms, and the patient feels well.

CASE IV.—A retired farmer, aged sixty-six years, had marked myocarditis with arrhythmia and a history of having had several attacks of decompensation and prostatic symptoms for five years. Acute retention of urine was relieved by catheterization four times during the past year by his physician. There was a moderate colon bacillus cystitis. Phthalein test showed thirty-eight per cent. eliminated in two hours. Suprapubic cystostomy was done with local anesthesia. One week later there was marked edema of lower extremities and of penis and scrotum, followed on the tenth day by acute cardiac collapse. Compensation was recovered. Four weeks after the establishment of cystostomy the phthalein test showed sixty-two per cent. elimination and absence of edema. The prostate was then removed through the suprapubic opening by intraurethral enucleation method of Squier. It proved microscopically to be an adenoma. Convalescence was rapid and the patient was discharged on the nineteenth day with the wound healed and continence nearly entirely established.

CASE V.—A man, aged fifty-four years, had had slight prostatic symptoms for one year: acute retention four

days previous to admission was relieved by catheter. There was no cystitis. Phthalein test showed sixty-five per cent. elimination in two hours. This was a simple, uncomplicated case of prostatic hypertrophy and the two stage operation was unnecessary. Suprapubic operation was performed in one stage with light ether anesthesia. Recovery was uneventful and the patient was discharged on the sixteenth day.

CASE VI.—A retired harness maker, aged eighty-one years, senile, had marked cystitis and multiple calculi. Prostatic symptoms had been present for about ten years. These were much more severe during the past year and were characterized by severe tenesmus, passage of ammoniacal, cloudy urine, and frequent urination of small quantities at a time. Catheterization by a physician was necessary three times within the last year. On admission to the hospital, the general examination was negative except for the usual evidences of senility. Systolic blood pressure was 175. Hemoglobin was 90; leucocytes, 4,600. The urine was strongly alkaline and had an odor of ammonia. It contained much pus from which a colon bacillus was obtained in pure culture. There were thirty c. c. of residual urine. Examination per rectum showed a very large, rather soft prostate with no evidence of malignancy. A phenolsulphonphthalein test showed a first appearance of the dye in eleven minutes, thirty-five per cent. excreted in the first hour and twenty-five per cent. in the second hour. The specific gravity of two specimens was 1016 and 1024 respectively. On the following day a suprapubic cystostomy was performed under novocaine anesthesia and twenty small stones were removed from the bladder. There was no shock. One hour later the patient sat up in bed and ate his lunch. Four days later his systolic pressure had come down to 155. Eight days later a phthalein test showed the first appearance in eleven minutes and a total of sixty-two per cent. eliminated in two hours. The specific gravity of the urine in the two samples now registered 1030 and 1031. On the following day, nine days after the cystostomy, the prostate was enucleated under light ether anesthesia. There was no appreciable hemorrhage and no shock. The prostate was very large and was found to be a simple adenoma. Convalescence was uneventful. Urination through the urethra occurred on the third day. The patient left the hospital at the end of three weeks after the prostatectomy with the bladder wound entirely healed and continence nearly completely established.

SUMMARY.

Twenty consecutive prostatectomies without a fatality, performed by the two stage suprapubic method, many of which were on patients who would ordinarily be considered as had surgical risks, bear witness to the relative safety of this method.

When properly controlled by functional and other tests, it minimizes much of the risk.

A preliminary cystostomy has the advantages of providing the best possible drainage, thereby affording relief of back pressure on the kidneys and an opportunity greatly to improve an existing cystitis before performing the more radical operation of enucleation of the prostate.

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Manometric Determination of Arterial Tension.

—Antonio Fulchiero (*La Riforma medica*, December 15, 1917) declares that systolic manometric measurements have no definite significance and that the diastolic reading is the index of the sum of the peripheral circulatory resistance. Pulse pressure has no relation to the volume of the cardiosystolic wave.

ECZEMA DUE TO DEFICIENT THYROID SECRETION.*

Report of a Case in Which the Administration of Thyroid Extract Acted as a Specific.

By M. H. EDELMAN, M. D.,

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CASE.—The patient in this case was a boy, three and one half years of age. The family history was as follows: The father was forty years of age, negative for syphilis, insanity, tuberculosis, and alcoholism. The mother was thirty-seven years old. She became gray at the age of twenty years; her sister was also gray at twenty years of age. The parents were not related; they had been married ten years. The mother was pregnant five times, having had three living children and two spontaneous miscarriages. All the children were normal except the patient, who was the third child. While pregnant with the patient, the mother was said to suffer from gravel in the bladder, for which she was under treatment. Diet during pregnancy consisted of cooked fruits, cereals, fresh vegetables, and milk; no red meats were taken. Diet was the same during nursing. The mother's condition during nursing was normal. Delivery of the patient was normal; he weighed eleven pounds. He had none of the diseases of childhood; he had furunculosis at six months of age. He was breast fed for ten months, regularly every two hours. He was weaned at ten months and was then given milk, cereals, and fruit juices. His present diet consisted of fruits, cereals, vegetables, skimmed milk, no red meats, eggs, sugar, and butter in moderation. Bowels were very constipated; his appetite was good. He slept very poorly. Urination was normal.

Until four months of age the patient was well, physically and mentally. Since then he had had a scaly and weeping eruption, involving the cheeks, forehead, chin, scalp, neck, shoulders, chest, and upper and lower extremities. He had been treated by pediatricists and dermatologists at many clinics of this city. Treatment was mainly local and dietetic. In spite of consistent treatment lasting three years the eruption became more extensive. It has always been very itchy, worse at night. For the past year, the mother noticed the child looking old; he was not as playful as formerly, seemed extremely quiet, and masturbated. The withdrawal or modification of the diet had no effect upon this eruption. The patient was able to hold up his head at three months, to sit up alone at six months, and to stand up at twelve months. He began to walk at sixteen months, and to talk at nineteen months; the first teeth appeared at six months. He was always considered a bright child. On July 27, 1916, the patient was brought to the Post-Graduate Hospital under the writer's care.

Physical examination showed the following points: The child had a cretinoid facies; his color was pasty. Mentality was normal; he stuttered. He was fairly well nourished and not obese; there was general glandular enlargement. There was an eczematous eruption on scalp, forehead, face, entire neck, shoulders, elbows, arms, chest, thighs, and legs. The skin was dry and coarse and wrinkled on the forehead, forearms, and hands. No hair was seen on the body. The head was twenty inches in circumference; its shape was regular and there were no bosses; sutures and fontanelles were closed. The hair was coarse and abundant; the scalp showed a seborrhea and was covered with a thick crust. The face was pasty and the cheeks covered with a dry scaly eruption and crusts. The eyes were small and reacted to light and accommodation; the pupils were equal; there was edema of upper lid, puffiness of the lower lids. Eyebrows were deficient. The upper eyelashes were normal; the lower were scant and fine. The mouth was open; the nose was saddle shaped; the ears were negative. The tongue was moist and clean and seemed to fill the mouth; the mucous membrane was normal. The teeth were regular; the upper two incisors were decaying. Gums were normal. Tonsils were small and imbedded; adenoids were present but not enlarged. A

*Read before the Pediatric Society at the Academy of Medicine, November, 1916.

tense, dry eruption involved the entire neck and there was general glandular enlargement. Because of the tenseness of the skin the child was unable to turn his head. The chest measured twenty-one inches in circumference and there was a scaly eruption on posterior surface; otherwise negative. In the lungs a few coarse râles were heard posteriorly. The heart was negative; pulse, normal. The abdomen measured twenty-one inches and seemed enlarged and distended. The liver and spleen were not palpable; no tumors or masses were felt; the abdomen was soft to touch and there were no tender areas or signs of fluid. There was slight umbilical hernia. There was no lordosis. There was an eczematous eruption from elbow to fingers; the skin over the fingers was wrinkled and dry and the fingers tended to squareness; the nails were brittle. There was an exudative eruption from knees to ankles; the skin was coarse and rough. The penis was hyperplastic and in a state of priapism. Testicles, both in scrotum, seemed and felt normal. Reflexes were normal. Urine was normal. The blood on first examination showed hemoglobin, seventy per cent.; red blood cells, 4,200,000; white blood cells, 6,500; polymorphonuclears, 62; lymphocytes, 36; eosinophiles, 2. Second examination showed hemoglobin, eighty per cent.; red blood cells, 4,600,000; white blood cells, 8,500; polymorphonuclears, 36; lymphocytes, 63. The Wassermann and von Pirquet reactions were negative. Temperature was 98° F.

On July 27, 1916, the patient was given 0.5 grain thyroid extract three times a day. No local treatment was prescribed and the diet was left alone. Bran baths were ordered to be given every night. August 2d. Patient returned transformed into a different child. The eczema of face and neck had almost disappeared and he was able to move his head freely; the eczema on the legs was improved slightly. The mother volunteered the statement that for the first time in three years the patient had slept through the nights. The itching remained about the same. Protective measures were used to prevent scratching and the same dose of thyroid continued. Weight was thirty-one and one half pounds. August 9th. Improvement continued; itching still persisted. The child weighed thirty pounds. Sodium bicarbonate baths were ordered instead of bran. Owing to rapid loss in weight—two pounds in fourteen days—we discontinued the thyroid extract and instead discontinued all sugars and fats from the diet and used Lassar's unguent as a local application. August 17th. The patient returned much worse; eczema had again appeared on face, scalp, and neck. The diet was then changed, allowing fats and sugars as previously, and again thyroid in 0.5 grain doses was given three times a day. Temperature was 90° F. August 30th. Weight, thirty-one pounds; again a marked improvement was noted. Thyroid extract was increased to one grain three times a day. September 25th. The patient continued to improve and gained in weight to thirty-two pounds. Since then the condition improved steadily, but not quite to the same extent as during the first week. At the present time, the weight was thirty-five pounds and he was receiving one grain of thyroid extract three times a day. He still retained the cretinoid facies, and the skin eruption, while still present, was softer, paler, and considerably improved. Those who knew patient previous to his treatment, could not believe he was the same child. He was eating better, bowels were regular, he was happier, wanted to play, and began to take more interest in his surroundings. Since then he has had a severe attack of measles, and when last seen, October, 1917, was enjoying good health. The skin was normal and he was in every respect a normal child. He has not been receiving any medication.

This case presents so many interesting points, that I desire to devote the rest of this paper to the discussion of some of them. The interesting points in the history were the premature grayness of the patient's mother and her sister and their rather pasty complexion which are suggestive of deficient thyroid secretion. It then becomes probable that the mother is responsible for this child's condition. The persistency and extent of the eczematous condition of the skin, in spite of careful dietetic and local treatment, suggests a rather complex etiology.

The eczema bears no relation to the food. The following facts in the physical examination are significant: general cretinoid facies; almost total loss of eyebrows; puffiness of upper and lower lids; pasty complexion; dry and coarse skin; slight lordosis; apparent large abdomen, or pot belly; umbilical hernia; anhidrosis or absence of sweating; extensive eczema; a practically normal mentality.

The miraculous improvement in the eczematous condition with the administration of thyroid and the remission when it was not given for a week, in spite of local and dietetic treatment, must be looked upon as additional evidence of the correctness of the diagnosis. We must conclude, then, that we were dealing with a disturbance of the thyroid gland, causing a diminished secretion, with a normal mentality—a condition of hypothyroidism. We had to decide whether this extensive eczematous condition was due to deficient thyroid secretion or to other causes. If in spite of careful dietetic and local treatment for three years, an aggravated and more extensive process was produced, having a negative Wassermann and von Pirquet, we were justified in assuming that the hypothyroidism was wholly responsible for the eczema, the same as it is responsible for the other cretinoid manifestation.

Can disturbances of the thyroid produce eczema? In considering the pathology of the skin in hypothyroidism, we find the skin undergoes a degeneration with a mucoid exudation into the subcellular tissue; the epithelium of the sebaceous glands becomes swollen and occludes the lumen, causing anhidrosis and favoring dermatosis and eczemas. Calcott, Weill, and Fox report cases of eczema, psoriasis, and ichthyosis due to diminished thyroid secretion. Winfield reports a case of skin manifestation in a child two and one half weeks old, and on autopsy the thyroid was found wanting. Basinger found that scaly like lesions of the skin develop in cretin rabbits. The hormone, or active principle, of the thyroid secretion, is supplied to the blood, as an iodized albuminoid, known as iodothyronin. This iodothyronin must be in normal quantities to produce proper activation of the metabolizing functions upon fats and proteins, but if this hormone be diminished, as we have in this patient, the metabolism of fats and proteins is lessened and tends to produce intermediate products, a gain in weight, and a slowing of all functions.

Sajous states that a perfect secretion of the thyroid is necessary for, 1, proper relationship of the amount of fat to the rest of the body; 2, proper nitrogenous metabolism of the body; 3, proper health and functions of the skin and its appendages, hair, nails, etc. Hence, deficient secretion is apt to produce disturbances of skin functions and to interfere with the metabolism of proteins and fats. The skin being the largest fat organ in the body, therefore bears the brunt of the manifestations occurring in deficient thyroid secretion. It must therefore be conceivable that changes in the hormone producing organs, resulting in disorders of general nutrition as above mentioned, may influence the evolution of such skin manifestations as dermatoses and eczemas.

In considering the treatment, we must bear in mind that a child with deficient thyroid secretion

has lessened metabolic powers; Magnus Levy, Du Bois, and Talbout, who have experimented with metabolism of cretins, found it to be very much less than normal. Talbout found that the metabolism of a cretin three and one half years of age was about equal to a normal child eight months old. This means that we must give less food to these children at the beginning of treatment and increase the food with the improvement.

Fairly large doses of thyroid should be administered at first, in order to remove results which have been produced by privation of thyroid secretion. Later, smaller doses are given to maintain a normal equilibrium and prevent a recurrence. Following improvement, the dose of thyroid which at first was sufficient later becomes an overdose, increasing the oxygenizing process, and the patient begins to consume his own fat. Thyroid, therefore, should only be given when definitely indicated. In conclusion, I may add that if we regard the lesions of the skin as merely a symptom rather than a disease, greater progress will be made. In every obstinate skin manifestation, a thorough physical and chemical examination of secretions and excretions is indispensable for determining the proper method of treatment. I would emphasize that the clinical picture of disturbances of internal secretions should always be kept in mind, for it is very important that they should always be estimated in connection with any other symptom, since upon the proper treatment of this factor usually depends success or failure.

530 WEST 144TH STREET.

A MODIFIED METHOD OF BONE GRAFT.

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CASE.—The patient came to me for the first time on October 28, 1916. He had been injured sixty days previously by the collapse of a building, injuries at the time being compound comminuted fracture of the tibia and fibula, three inches above the right ankle joint. He was given emergency treatment and ten days later the fracture was reduced by open operation in a hospital. A cast was applied from the toes to half way up the thigh. After about fifty days an x ray was taken through the cast and the patient was discharged. He then came under my care. I removed the cast and found there was no union of the fragments. The leg was one inch shorter, there was an angular deformity of the leg three inches above ankle, the apex of the angle being posterior, and the ankle was greatly swollen. Landmarks of the ankle were difficult to map out, and the shape of the foot was distorted. Wassermann test was negative. Ten c. c. of the patient's blood removed from median basilic vein was injected to promote union. After two weeks' immobilization of the part an x ray was taken with the cast on and nonunion of tibia was found with no callus formation. There was union of the fibula. The lower fragment of tibia was displaced backward and inward with an open space, as shown in the x ray, between it and the upper fragment. There was slight motion at the point of separation of fragments, both anteroposteriorly and laterally. Patient was operated on by me December 21st.

Operation. The entire leg was sterilized the night before operation and on the day of operation was painted with three per cent. iodine. A five inch incision was made along the crest of tibia down to within one inch of the ankle joint, the upper and lower fragments of tibia being brought to view. Some fibrous union between upper and

lower fragments was easily broken by blunt dissection. The ends of the fragments were scraped with a sharp curette and fragments were freed from surrounding tissues. Apposition not obtainable because of atrophy and shortening of the bones. A three inch piece of the tibial crest, prismatic in shape, three inches in length, by half inch in width, by half inch in thickness, was removed from the upper fragment about two inches above the fracture. The anterior surface of the upper and lower fragments were approximated with the exact shape of the bone graft that had been removed from the upper fragment. The bone graft was wedged in a groove made for it in surface of tibia, upper and lower fragments, raw surface to raw surface. The periosteum was not removed from the bone graft. The graft was held in place by five chromic catgut sutures, three placed completely along the tibia at its upper and lower fragments and tied to one side of the bone graft. One pair of chromic catgut sutures was placed through a hole bored through the upper end of graft and the upper fragment. The same was done with lower end of graft. The fascia was then sutured over the bone with catgut and skin closed over the whole with silkworm gut. One per cent. formalin dressing was put over the skin incision and loose gauze over this. A plaster cast was applied from the toes to the middle of the thigh.

The patient recovered uneventfully from effective operation. Two weeks later a window was cut in cast through the field of operation and the wound was examined. There were no sloughing, no infection, no sinus, and primary union. The sutures were removed and the window closed. The patient was allowed out of bed and in a wheel chair. Six weeks later the entire cast was removed. Examination showed good union and a well shaped foot and leg with no deformity. A light removable cast was applied and the patient was instructed to massage the foot and leg daily. Eight weeks after operation the patient was permitted to walk around on crutches with a brace below the knee to ankle. After two weeks the crutches were discarded and only a brace was used. When seen three months after operation, he had removed brace and was walking around almost normally. There was one inch shortening of leg with a partial ankylosis at ankle, but no visible deformity. A slight limp was only noticeable after attention had been called to it.

Syphilitic Joint Disease Simulating Tuberculosis.—Percy Willard Roberts (*Journal A. M. A.*, February 9, 1918) says that until very recently the diagnosis of tuberculosis joint disease was considered one of the easiest in medicine, but that this is wholly unwarranted by the facts, for a considerable proportion of cases with gradually developing arthritis, spasm of muscles on passive movement, general limitation of motility, atrophy, limp, pain, and alteration of posture will be found on careful examination to be due to congenital syphilis. The diagnosis of the syphilitic origin of these cases of arthritis must include the most careful investigation of the family and past history of the child, and the most thorough physical examination of the child for evidences of syphilis. Of these the occurrence of dental deformities, such as Hutchinson's teeth, widely spaced incisors, early decay, and the several types of irregularity in the development of the molars, is perhaps the most important. Other evidences should be sought in scars of skin lesions, corneal opacities, and tender tibiae. All cases of chronic joint disease in children should be regarded as syphilitic until this is excluded. This is important because syphilitic joint conditions are amenable to treatment by mercury and the iodides, while permanent disabilities may be produced if they are subjected to the measures employed in the treatment of lesions due to tuberculosis.

Our Readers' Monthly Prize Discussions

Twenty-five Dollars Is Awarded for the Most Satisfactory Paper

All persons, whether subscribers or not, are invited to compete for the prize of \$25 offered for the reply deemed best by the editors to the following questions:

CXCI.—How do you treat lobar pneumonia? (Closed.)

CXCII.—How do you treat whooping cough? (Answers due not later than March 15th.)

CXCIII.—What kind of feet must a soldier have? (Answers due not later than April 15th.)

The award will be based solely on the value of the information contained in the answer. No importance will be attached to literary style. Answers should preferably not contain more than six hundred words, and should be written on one side of the paper only. All papers submitted become the property of the JOURNAL, and should bear the full name and address of the author for publication. The prize will not be awarded to the same person more than once within a year.

The prize of \$25 for the best answer to Question CXC has been awarded Dr. T. J. Tudor, of Keokee, Va., whose paper appeared on page 404.

PRIZE QUESTION NO. CXC. TREATMENT OF BURNS.

(Continued from page 406.)

Dr. Louis Newwelt, of New York, makes the following contribution:

The problem of the treatment of burns consists of four elements: 1, the prevention and treatment of shock; 2, applications to the burned area, including the first dressing and subsequent dressings for the prevention of sepsis; 3, the prevention and treatment of contractures; 4, the prevention and treatment of the complications resulting from the toxemia—duodenal ulcer, nephritis. To prevent or treat the shock in a burned patient is the first and most important part of the treatment. The patient should not be moved or the clothes removed until he has received an adequate dose of morphine. In marked shock, subpectoral or rectal saline enemas are given. Sufficient blankets to cover exposed areas should be provided to prevent chilling. As soon as the shock has passed off the clothing is carefully cut away. The room temperature should be about 110° F. Compresses of a one per cent. picric acid solution are applied in sections to facilitate removal and held in place by a bandage. The first dressing is left in place for forty-eight hours. Inextensive superficial burns of the first or second degree do well with a coating of the tincture of chloride of iron, leaving the part exposed in a warm room and without a covering. In severe shock, the patient is at once placed in a continuous hot saline bath, 90°—110° F., and the clothing is removed only under water. This precaution is very important. The bath should be continued and repeated if necessary until the shock has completely and permanently passed off. Plenty of fluids are given and medicinal stimulation is administered where necessary.

The first dressing plays an important part in the prevention of sepsis. The skin surrounding the burned area should be washed twice daily with alcohol. All blebs are carefully and frequently pricked and the crusted areas incised and elevated to secure adequate drainage. In the minor cases the open air treatment seems most desirable. The tincture of chloride of iron is sopped on the burned area and repeated every hour until a protective

layer is formed, and later is applied only occasionally. At first this is slightly painful but subsequent applications are painless. No dressing is necessary but a light bandage may be applied for protection. After a few days, warm saline solution is applied to small portions of the crusted area, and after forty-eight hours the crust is removed, leaving a clean, raw, granulating surface. In severer cases, second degree, a one per cent. solution of picric acid serves well. The first dressing is left on for forty-eight hours.

The tendency to the formation of contractures can be considerably diminished by three measures. First and most important is the prevention of sepsis; second, the early and continuous application of properly moulded plaster of Paris casts before granulation begins; third, the early use of active and passive motion and massage.

The symptoms of the complications are due to toxemia resulting from the absorption from the burned area and readily respond to dram doses of sodium bicarbonate three or four times daily, in addition to the forcing of fluids. For severe third degree burns the paraffin treatment is indicated. There are various paraffin preparations on the market, all resembling the original ambrine introduced by Dr. Barth de Sandtford, of Paris. The method of application is as follows: The burned area is gently cleaned, removing the dead skin and discharges and the blebs are pricked near their bases but the cover is not removed. The surrounding skin is thoroughly cleaned with alcohol, and the part is allowed to dry. Drying may be hastened by a warm air blower, by gauze overlaying, or by fanning. The paraffin is melted in a hot water bath, and is then painted quickly and gently with a one and one half inch camel's hair brush over the burn and for about two inches over the surrounding healthy skin. The paraffin dries quickly in a thin, smooth film. A very thin layer of cotton slightly larger than the burn is laid over the paraffin film, and a second layer of paraffin is painted quickly over all. Near joints a splint is applied to immobilize and prevent the film from cracking. A bandage is then applied. This dressing is at first changed every day, but later as the secretion decreases, every other day. The advantages of this dressing are: it is painless; it is easy to apply and remove; it does not favor infection; more rapid

healing results; it leaves a smooth, soft, pliable scar; to the patient it is a great comfort.

Dr. Louis Frischman, of Yonkers, contributes:

Extensive burns may be divided into three stages: 1, the stage of shock; 2, the sloughing stage; 3, the stage of cicatrization. The first consideration in the treatment is shock. A hypodermic injection of 0.25 to 0.5 grain morphine will act favorably on the condition of shock in that it relieves the pain and keeps the patient quiet. If the shock is profound, adrenalin may be administered intravenously, and saline by hypodermoclysis or proctoclysis. In local treatment all vesicles are punctured. If a very large portion of the body is affected, the continuous saline bath is in order. It prevents sepsis, keeps away the air and alleviates the agony of the patient. The paraffin method of treating burns was introduced by De Sandtford in a preparation he calls ambrine. The results achieved by this method of burn therapy have entirely justified the tremendous reputation it has achieved. The treatment consists in irrigating the burned surface with sterile water, drying, and either painting or spraying the surface with ambrine. Then the surface is covered with a thin layer of wool and a second application of the paraffin is made. The paraffin hardens soon after it is applied; then a layer of wool and bandage is applied.

The main advantages of the paraffin method of treating burns may be epitomized as follows: 1, burns heal rapidly; 2, constitutional symptoms are minimized; 3, pain is lessened; 4, scarring is reduced to a minimum; 5, the necessity for grafting is lessened; 6, sepsis is rare. The favorable effects of this method of treatment may be attributed entirely to mechanical factors. The burn is mechanically protected from the air and the immobilization from the hardening of the wax and protection of granulation tissue are the factors responsible for the success of the treatment. The increased vascularization incident to the application of the warm paraffin undoubtedly facilitates the healing process. The epithelium proliferates and the burnt area heals either by granulation or by extension of epithelium from the edges. The paraffin affords the much needed protection to the delicate and newly formed epithelial cells. The ordinary ambrine has a lower melting point than wax, is more elastic, does not crack, and adheres readily to the skin. As the ambrine preparation acts only by virtue of its mechanical properties, Hull has devised a preparation which adds stimulating and antiseptic properties. The burn is irrigated with sterile water and dried. The melting point of Hull's paraffin preparation is 48° C. As soon as the melted paraffin shows a solidifying film on the surface, it is applied with a camel's hair brush. A thin layer of wool, a second layer of paraffin on this, and wool and bandage complete the dressing. This is changed every forty-eight hours.

The formula for this very satisfactory method devised by Hull, consists of:

Betanaphthol,	0.25 per cent.
Eucalyptus,	2.0 per cent.
Olive oil,	5.0 per cent.
Paraffin molle	25.0 per cent.
Paraffin durum	67.75 per cent.

Dr. H. M. Stanley, of Creston, Iowa, states:

Determine first the character and degree of the burn. If the burn is of the first degree apply a dressing at once. With a second degree burn with the formation of blisters, rupture the blister at once allowing the serum to escape and the displaced epidermis to return to its former position. When reduction is complete apply the dressing in the same manner as a first degree burn, which is as follows: Cut four to six pieces of plain gauze to cover the area involved, and saturate with camphorated phenol. Apply this dressing and fix it to the parts, and leave it in place for twelve to twenty-four hours, keeping it moist with camphorated phenol. For first degree burns one such dressing well applied and kept moist will be all the treatment necessary. Areas where a blister was evacuated often look perfectly normal at the end of twenty-four hours with no subsequent desquamation of the epithelium. The salient points in this treatment are immediate relief of pain, the reduction and abortion of inflammation, and above all the antiseptic action of all the ingredients make a desirable dressing of perfect therapeutic balance and efficiency. For burns beyond the second degree I use the same dressing, but with frequent changing necessary especially when sloughing of destroyed tissues begins. After cleaning away the sloughing masses the wound granulates and skin forms rapidly and with remarkable little scar formation.

Paraffin Treatment of Burns.—Alfred J. Hull (*British Medical Journal*, December 15, 1917) has tried various combinations of paraffin with the new and nonirritating antiseptics and also the plan of preceding the use of paraffin by the application of an antiseptic. The best results so far obtained have been by preliminary washing of the burned area with normal saline or a 1:1,000 solution of acriflavine or proflavine; thorough drying of the surface with gauze or an electric drier; painting on of a layer of paraffin; application of a thin layer of wool; further application of paraffin; and the application over all of a dressing of wool and bandage. This dressing is changed once a day. When such antiseptics as eucalyptus oil, betanaphthol, and flavine were mixed with the paraffin it gave better results than the use of plain paraffin. Scarlet red added to the paraffin provided an excellent application for the stimulation of granulation after the wound had become clean. The following are the formulas for the three most satisfactory preparations:

NO. 7.	
Resublimed betanaphthol	0.25 per cent.
Eucalyptus oil	2.00 per cent.
Olive oil	5.00 per cent.
Vaseline	25.00 per cent.
Paraffin	67.75 per cent.

NO. 10.	
Scarlet red	0.2 per cent.
Eucalyptus oil	2.0 per cent.
Olive oil	5.0 per cent.
Lanolin	4.0 per cent.
Soft paraffin	21.0 per cent.
Hard paraffin	67.8 per cent.

NO. 13.
Same as No. 10, with flavine substituted for the scarlet red.

Medicine and Surgery in the Army and Navy

DERMATOLOGY IN THE ARMY.

BY H. C. L. LINDSAY, M. D.,

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Is there a sphere for the dermatologist in the army? Most decidedly, yes. A very large proportion of cases, nearly ten per cent., which come to the hospital on active service, outside of the "prevailing epidemic" and wounds, are for the treatment of skin diseases. Napoleon first established the army surgeon because the latter was an economy in the prevention of waste of men in his front lines. A dermatologist acts as a real economy by returning men suffering from skin diseases back to the front in the shortest space of time. The skin department of a base hospital not only relieves the surgical department but it safeguards it from contamination from such contagious skin diseases as happen to be going the rounds. The general practitioner is only too glad to disclaim any great knowledge of skin diseases, and this holds equally true with the volunteer army surgeon.

Where does the work of the dermatologist begin? I would say as consultant to the recruiting officers. Here he may be able to give an expert opinion regarding cases claiming exemption on account of having, or having had, certain diseases, such as syphilis, dermatitis herpeticiformis, chronic or recurring eczema, erythema perstans, psoriasis, lichen planus, especially when the medical officers conducting the examination find little to bear out the truth of the conscripts' declarations. On the other hand, his opinion would be valuable in estimating whether a man who asserted that he was cured was really cured or temporarily in abeyance to treatment. Experience has shown that it takes but a short time in the army if skin diseases are not treated for the adverse conditions, such as tinned food, poor washing facilities, and cold in the front line trenches, to bring forth their particular maladies in all their frightfulness, and I use this word advisedly.

Next, I believe, prophylaxis may be of some benefit especially in the prevention of the spread of scabies and pediculæ, which at times amount to a scourge if the conditions are favorable. One needs only to pause a moment and ask oneself: "How often did Jack get a change of clothes and bath when facing the Turks on rocky Gallipoli's inhospitable slopes?" or "Did Bill really carry all the day's ration of water in that small bottle when crossing Asia Minor's deserts?" These two diseases contracted on active service are almost invariably accompanied with ecthyma or impetigo in virulent forms. Noncommissioned officers should be instructed to insist on the cleanliness of the men, as far as possible, particularly of their hands and faces even when water is scarce. Every man could wear a small sulphur bag, back and front on a neck string, after the manner advised by Jamieson, to keep him free of pediculæ.

Incidentally I have already mentioned some factors productive of skin diseases on active service.

Flies, food, fingers, fluids, filth, and fools certainly are responsible for a great deal, causing or conveying many of the actual troubles. Fly and flea bites as well as those of other insects form a percentage of the cases in the south. *Phlebotomus* fever and malaria, communicated by the bites of the *phlebotomus* fly and the mosquito, respectively, are not in themselves skin diseases. Typhus fever, however, is of direct interest to the dermatologist, being conveyed by the flea and being manifest by the peculiar marbling of the skin. These pests are insufferable in hot countries when you are on active service. Food is usually good, one finds, though the tendency is to eat too much nitrogenous tinned foods when on the move or in the front line. Urticaria is common, psoriasis rapidly becomes worse, and eczema becomes really terrible. Water is used in proportion to its scarcity. When little exists and the quality is poor, less is used for washing and drinking. The dyspeptic with his crop of acne becomes a sight. His natural cathartic is missing or the diluent to his unnaturally concentrated food is absent, and his companions wonder whether he has smallpox. The purity of water is, as a rule, of primary importance to the dermatologist in so far as skin diseases are concerned. Occasionally men are seen who have the most violent attacks of urticaria just after bathing, either from the action of cold on the person predisposed or from some contamination in the water. The latter is probably the case when several men present themselves after having bathed in the same pool. Typhoid fever and the more prevalent dysentery are both water borne diseases. The first is of interest to the dermatologist from a differential diagnostic standpoint of the skin manifestation and in the treatment of the accompanying herpes, although that may be left properly to the medical department. Both these diseases may be accompanied by considerable scalding around the anus, which may provoke the attending surgeon to calling in your professional skill. The initial skin lesion in a large number of cases is a scratch mark from a dirty fingernail; this spot, having matured a fine growth of germs, becomes the focus for transmission to other spots wherever the finger happens to scratch. When the soldier shakes hands with his companions, he transmits the disease to them so that at the end of their "nine days in," the regimental surgeon having run out of unguentum hydrargyri ammoniati, or mercurial ointment, and also of every available substitute, they nearly all present the vagabond's *pediculosis corporis* disease, even to having their hair matted with it. The worst cases are sent down to you at the base, while the milder ones only reach the casualty clearing hospital and the others may continue under the care of the regimental surgeon who replenishes his stock of exhausted medicaments.

The extremes of heat and cold suffered by men in the trenches tend to aggravate many conditions, but aside from this they are more or less the direct cause of work that comes under your department.

You may have anything from frostbite to sun blisters to treat in the course of twelve months. Dampness associated with cold predisposes the men to rheumatism and its concomitant, at times, purpura, which is decidedly more frequent than one sees in private practice.

The soldier's occupation also predisposes him to certain inconveniences; marginate eczema between the thighs is rampant during the hot weather. Corns and calluses often add to a soldier's petty worries, even if he is not already suffering from "nerve strain." Cases of lichen planus, which are occasionally met with are possibly due to the prolonged strain. Certainly herpes zoster occurs, but I do not know whether more so than in normal civil life. Ulcers of the legs, due to previous varicose veins, breaking down of healed or partially healed wounds, syphilis, or streptococcus infection, are met with constantly, in spite of the fact that every man is passed as physically fit before he is allowed to join up. These ulcer cases are well within the sphere of the dermatologist and he frequently has cases handed over to him by the surgeon, who feels that in promoting the final stages of healing, the dermatologist may have some special methods at his disposal. Many of these ulcers have a surrounding areola of eczema that is quite as trying to the surgeon to cure as the ulcer. Bad burns are met with. Sporotrichosis exists in France but is rare; the ulcers somewhat resemble syphilitic ulcers.

Skin surgery, cosmetic surgery, and skin grafting should be done by the dermatologist. The latter should not let himself be lost sight of. He should bring the importance of his work to the notice of the authorities and when the unit is being formed, he should see to it that the special equipment necessary for the special work of dermatology is included in the requisitions: otherwise he is apt to be handicapped in his efforts. The army usually supplies a fairly complete outfit to the surgeons, but if you are accustomed to the use of certain instruments, scalpels, radiometers, pemetrometers, hypodermics, localizing apparatus, needles, etc., why not take a few with you? You are allowed more latitude with hospitals in regard to the amount of baggage you transport than others, and if you leave these articles at home, they will possibly be useless by the time you get back.

The range of dermatology is not confined to soldiers only, because although with almost every disease among them, the same as you would meet in ordinary practice, still you will find a big, interesting field among the refugees who, on account of the conditions in which many of them live, are susceptible to everything of this nature. Then, too, many of these are old or young as the case may be and you will find an endless variety of diseases. In the south you may run across leprosy by the roadside or caratè, beriberi, plague, or cholera; it all depends on where you are sent.

Every base hospital should have a ward devoted to the treatment of diseases of the skin. Are there any difficulties in conducting a skin ward? None that are insurmountable. Most of your patients are of the ambulatory type. Most of them suffer from either infectious or contagious diseases. It is of the utmost importance that you have no

promiscuous visiting from outside wards and equally important that you keep the different types of disease separate from one another. This is no easy task. The man who feels well and can walk about seeks diversion, and unless your orderly is alert, a game of cards will be in full swing and a free exchange of filthy disease will take place in the very place where they are supposed to get well. Excessive smoking, I believe, prevents rapid cure of some diseases and it is astounding the number of cigarettes a Tommy can use up in a day when his twenty-four hour day in hospital offers little other amusement. The skin ward is one in which you can give punishment for breackage of the rules without inflicting an injury to the patient. Thus you could put a man with scabies on night guard duty. Thus he would not come in contact with others as the sergeant would give him his orders as to "beat" and sleeping quarters, so that contingency would be overcome.

Possibly, at times, transportation may be at fault, and you may not be able to obtain the drugs that you require. The drug department may accidentally run out of the commodity which you most desire. Emergencies such as these stimulate your ingenuity. You may have to substitute the next best drug or the next and the next. You may have difficulty in getting fuel or water, even for cooking and drinking. You may be in tents with the temperature below zero. It all depends on your assignment. The area of hostilities covers practically from the equator to the pole; and once you join up, you may be sent anywhere under orders from the extreme north to the centre of the heat belt.

The equipment of the base hospital, aside from the administration, stores, messing, sleeping, and recreation departments, which are of interest to the dermatologist in particular, are the operating room, x ray and light department, the laboratory, the bathing or hydro outfit, and the fumigation and sanitation departments, as well as the equipment of the individual wards. The personnel of these hospitals is necessarily large, partly because of the great amount of individual attention demanded, and also because a great deal of the work comes in rushes and the staff must be sufficiently numerous to cope with the epidemic when it is at its greatest height. This is true with any hospital at the front; as the staffs have to be equal to the strain after a "big push" of taking care of the wounded. Relatively speaking an ordinary military hospital of practically 1,000 beds requires in the neighborhood of thirty doctors or surgeons, seventy-five nurses, and the balance up to about 300 composed of orderlies and noncommissioned officers. Only trained nurses should be taken; the orderlies, though, should be chosen from every walk of life—civilian hospital orderlies, druggists, engineers, surveyors, drillers, carpenters, cooks, clerks, plumbers, tailors, ball players, photographers, electricians, etc.—because they will fill useful billets once you are located with any degree of permanency. In addition to their routine duties, they can be made use of along their professional lines. You will find good cooks an especial acquisition to any camp. Then too a competent dietitian is also indispensable.

When you go to the front, go unselfishly. You

will be making a real sacrifice and nothing can compensate you for the valuable time you will spend there except the thanks which the grateful soldiers will give you. No medical officer is, in my opinion, adequately paid as far as monetary consideration is concerned, but of course few go for that purpose. It is, though, important that an officer should receive sufficient to take care of his dependents when he is at the front. His time, in a sense, will be lost; but nevertheless it is the duty of us all who are able to make the sacrifice, to make it.

470 TRANVILLE STREET.

TREATMENT OF WAR WOUNDS OF THE BRAIN AND ITS COVERINGS AT CASUALTY CLEARING STATIONS.

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(Concluded from page 411.)

TREATMENT.

The objects of treatment can now be shortly summed up: 1, to prevent or remove infection, thereby preventing further destruction of tissue; 2, to establish diagnosis in some cases of doubt; 3, to remove all sources of irritation to the brain, if this can be done without causing further serious damage to it. One cannot undo the initial surface wound or cerebral lesion, but one can try to procure a condition which will allow healing to occur more rapidly, more normally, and with less permanent impairment of function. 4. In any case to procure rapid healing of the superficial parts, provided that the brain is safe. We may be charged with being too zealous in operating on head injuries. I cannot remember death occurring after any operation which was not one of urgency. We have regretted that we have not operated or operated sooner on some patients who have done badly. In all injuries it is held that operation furnishes an additional and usually accurate means of diagnosing the extent of the lesion. In minor injuries it has done no harm so far as can be ascertained, and it renders the patient fit to return to duty at a much earlier date than would otherwise be the case.

It is better to send a patient home with a healed scalp and healthy skull, inside which are the fewest possible potentialities for future brain trouble, than that he should go with the prospect of a later operation on an area which is obscured by many abnormalities. If it can be shown that this is done with as great safety as attends more conservative methods, the procedure is more than justified. Sepsis and the exigencies of war will always make the proportion of failures a relatively high one.

Routine of treatment.—On admission, the patient's hair should be shaved off or removed with a depilatory paste, the wound thoroughly examined—the use of a probe is deprecated—two skiagrams taken in planes at right angles to each other, and a neurological examination made. If all the hair is not removed, other wounds, sometimes more important than the most noticeable one, may be over-

looked. An aperient should be given and the administration of urotropine, fifteen to twenty grains every three or four hours, begun. If the brain is injured it is well, if possible, for future guidance, to make a bacteriological examination of the discharge. If brain matter is exposed or exuding from the wound, operation should be carried out as soon as possible. In most other cases in the absence of urgent symptoms there need be no great haste, but in no case should operation be postponed for longer than a couple of days. The superficial wound should meantime be treated as already described.

Excision of wounds.—The majority of wounds of the scalp should be excised, and the bone beneath carefully examined. If no further interference is made, the wounds can be sutured, usually without drainage. It may be necessary sometimes to slide flaps in order to make up for defects in the scalp. After disinfection of the wound and surrounding scalp the damaged soft tissues are excised by a lemon shaped or elliptical incision down to bone about a quarter of an inch from the lacerated margins. The wound itself should be cauterized, or desiccated by thorough rubbing with five to ten per cent. picric acid in spirit and drying with a swab. If the periosteum is carefully divided, especially at the ends of the incision, it is easy to remove damaged scalp and pericranium *en bloc* with the handle of the scalpel or a periosteum elevator. Sufficient access to the bone and brain can, in almost every instance, be got through the incisions recommended. Turning down a U shaped flap introduces a needless complication and frequently prevents suture of the excised original wound. If this wound cannot be closed, healing by granulation must take place directly over the wound in the dura and brain—an obvious disadvantage. Covering the exposed brain with pericranial or muscular flaps, which are left exposed in the depth of the wound, is rather a precarious procedure. In practically all cases the area of operation can be covered in by healthy scalp, by simple suture or by a plastic operation such as described below. The use of the U flap of civil surgery is advisable in removing a foreign body through an unwounded area and in decompression operations for hernia cerebri. The latter have rarely been attended with success.

Depressed fracture.—Every case in which depressed fracture of the skull is suspected should be explored without undue delay, whether sepsis is present or not. Delay and waiting for surface wounds to clean too frequently lead to dangerous intracranial developments. If the edge of the wound is much inflamed and infiltrated, treatment with hypertonic saline applications or a paraffin paste usually makes it fit for excision in twenty-four to forty-eight hours. In most cases it is possible so to excise the wounds in both scalp and bone that an aseptic field of operation is left. If sepsis has already penetrated to the depth of the brain, the sooner operation is done the better.

The injury comes under one of the following varieties:

1. *Cases without definite external signs of depressed fracture.*—Because fracture with displacement of the inner table or some other subcranial lesion may be present, it is important that operation

should be carried out. When the entrance and exit wounds are separated so far by a bridge of scalp that the line joining them traverses the bone, or if the patient has been stunned at the time of injury, the presumption is that the bone has been damaged. Such wounds and the track between them, as well as single gaping wounds of the scalp, should be excised *en masse*, including the pericranium. Injury, even mere bruising, of the periosteum usually means that the bone has suffered. If focal loss of function, even although evanescent, persistent headache, giddiness, or other more definite signs of cerebral compression are present, especially if optic neuritis coexists, trephining should be done, even in the absence of definite laceration of the periosteum.

If fracture of the outer table without depression is found, or even if the bone is merely bruised, a small trephine opening in the external table only should be made and the inner table examined. Depressed fracture of the inner table may exist without any apparent injury to the external table or any cerebral symptoms, and only the very best skiagrams will show such a fracture. Operation in such cases is practically without danger.

2. *Fracture with depression but without injury to the dura mater.*—The fractured and probably septic bone is excised either by making a very small trephine opening outside the soiled area and completing the removal with a skull cutting forceps, e. g., De Vilbis, just wide of the shattered bone, or by the nibbling method, using a properly devised small gouge forceps. It is better to work with a small forceps and nibble the bone away in small pieces than to use a large powerful forceps which may cause extensive fissure fracture. The former trephining method is theoretically the better technic, but the latter is simpler, gives equally good results, and does not entail removal of so much bone. It is not necessary to trim the edge of the resultant opening in the bone. It seems likely that bone is thrown out more readily from an untrimmed margin, so that the opening may become greatly reduced in size. If the dura is apparently normal and the brain pulsates well, the operation can then be completed by suture of the scalp with or without drainage. If, however, the dura is muddy looking, if there is loss of pulsation and circumscribed loss of elasticity, especially if focal symptoms have been present after the wound was received, the dura should be opened. This is usually best done by a small crucial incision. Disintegrated brain and blood clot are squeezed out by the *vis a tergo*. If the pulped material does not come out quite readily, it may be helped out by inserting a small artery forceps for a short distance and opening the blades so as to dilate the hole in the dura and underlying membranes. Only the useless matter will exude unless the intracranial pressure is high, in which case lumbar puncture is indicated.

3. *Injury of dura without foreign body or sepsis.*—Fracture with injury to dura mater, when no foreign body is present and the wound in the brain probably aseptic, occurs frequently. After excision, *en masse* as before, the scalp wound may be enlarged in any desired direction in order to procure adequate access. The bone around the fracture is

cleared. A trephine opening is rarely required. The spicules are removed and the skull cut away carefully with forceps to an extent varying with the injury to the dura. A clear margin of one third of an inch of uninjured dura should be exposed. Great care must be exercised to separate the dura from the bone while this is being done. Ragged edges of dura should be excised. If a track exists in the brain, this should be carefully explored, by the finger if possible, and any collection of pulped brain tissue allowed to escape. If thought advisable a piece of aponeurosis may be drawn across the opening in the dura, and the operation completed by suturing the scalp wound. A drain of folded jaconet or small rubber tubing should reach from the opening in the dura through one end of the wound. It should be removed after twenty-four hours. If sepsis asserts itself, the wound should be freely opened up at once.

4. *Injury to the dura complicated by a foreign body in the brain and by sepsis.*—The position of the foreign body is previously determined by x rays. At the operation, as in 3, the track through the brain matter can usually be explored by the index finger. It may be necessary to enlarge the wound in the dura slightly. The foreign body having been located, a suitable flat or slightly curved scoop is passed along the finger under the foreign body which is then pressed against the point of the finger, and all three are carefully and gently withdrawn. The greatest delicacy of touch is required during this procedure. The finger, in a flexible manner, must follow the previously formed track, and must not break through uninjured brain substance. Any stiffness of the finger must be avoided. The use of a forceps is apt to increase the damage to the brain. A foreign body or piece of bone may often be coaxed out by making very slight flexion movements with the distal phalanx of the examining finger. If the track will not admit the finger, the foreign body can usually be left with safety. A drain should be inserted in all cases, as already described. If definite sepsis is present drains should be inserted in the track, leading straight out through the wound. In the worst cases the scalp wound should not be sutured till all danger has passed.

The exploration for foreign bodies by the finger at the primary operation is justified by the following considerations: 1, A track through brain substance is already present; 2, only very rarely is further injury to the brain caused by the procedure; 3, an abscess frequently develops if the foreign body is left in the brain; 4, if the wounds are large, sepsis has almost certainly penetrated along with, or following, the foreign bodies, and, as has been said, the sooner they are dealt with the better. As already indicated, foreign bodies imbedded in the brain, by their direct influence and by their interference with the cerebral circulation, may produce symptoms of focal irritation and of compression or increased intracranial tension. If their removal does not immediately relieve these, and especially if hernia cerebri is threatened, lumbar puncture should be resorted to. If this fails to relieve the intracranial tension, subtemporal decompression may give relief, but has on the whole proved an unsatisfactory operation under these septic conditions.

5. *Fracture with injury to one of the blood sinuses.*—Operation in such cases may be difficult on account of the alarming hemorrhage which may occur during exposure of the sinus. It should not, therefore, be undertaken by an inexperienced operator. The size of the superficial wound of the scalp or skull gives no indication of the extent to which the sinus may be injured. The results of such operations have been very favorable. Three of the procedures recommended for control of such hemorrhage have practically been given up, namely, lateral application of suture or forceps, plugging with gauze, and ligature. Plugging and ligature especially must be avoided behind the entrance of the parietal lacunae or cerebral veins. It has been found that practically all cases which survive the immediate effects of the injury are amenable to treatment by the application, under light pressure, of a piece of aponeurosis cut from the edge of the scalp wound or from the fascia lata of the thigh. The procedure is known as the "postage stamp" operation.

After free and rapid exposure of the hole in the sinus, hemorrhage therefrom being controlled by light gauze pressure, the "stamp" should be cut and spread on the palmar surface of the point of the operator's gloved index finger or on a small swab covered with batiste or rubber tissue. The perforation is then blocked by a finger of the other hand. All blood clot is carefully wiped away, the controlling finger is removed and the "stamp" applied rapidly over the perforation. Fairly firm equable pressure is kept up for a few minutes, when the graft will have adhered to the wall of the sinus. If the tear is a large one, the "postage stamp" and swab may be bandaged in position for twenty minutes or so while the operator does something else. A hole, measuring three fourths by one half inch, has been closed successfully in this way, and, judging by the ease with which this was done, it should be possible to close even larger ones. The graft should always be covered by scalp at the end of the operation. In these cases it is practically always possible to suture the scalp wound completely, a small soft drain being inserted close to but not on to the graft, and withdrawn in a day or so.

Lumbar puncture.—Lumbar puncture has frequently been found to give relief in cases of local circulatory disturbance after operation, evidenced, for example, by persistent headache, recurring focal muscular spasms, or slight hernia cerebri. The amount of cerebrospinal fluid withdrawn varies with the pressure of the fluid. It is rarely necessary to remove more than twenty-five c. c. or thereby. Usually the withdrawal of a much less quantity suffices. The process may be repeated several times if thought advisable. It ought to be resorted to before any marked signs occur. Certain cases of large fungus cerebri have been cured by this procedure. If fungus is present, however, while it is to be regarded as a symptom of increased intracranial tension, it must be remembered that this is frequently due to the presence of foreign bodies or abscess in the brain or to more diffuse encephalitis or meningitis, and suitable remedies must be used for these conditions. If meningitis is present or if

the fungus is fairly recent, rapid removal of cerebrospinal fluid may allow infection to spread.

The wound should always be exposed for inspection when lumbar puncture is done, because this may cause the herniated brain to sink back to a considerable depth and protective adhesions may be torn. If lumbar puncture fails to alleviate the condition, a contralateral decompression operation may be tried. Spirit dressing is usually employed for such cases. Picric acid, 0.5 to one per cent., or some astringent preparation may, with benefit, be added when discharge is free. The free application of "bipp" has been found of great value in many cases. In most cases of hernia cerebri it will be found that posture has a marked effect, the protrusion being lessened when the patient is propped up in the Fowler position. This position should be adopted immediately after operation. A smart intestinal purge is also sometimes effective. It is not advisable to make lumbar puncture in the early stages after a wound of the brain has been caused, unless the dura is intact, or until the exact local conditions have been revealed by operation.

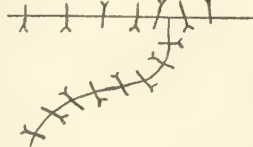


FIG. 2.—Operation concluded.

Closure of the scalp.—In the great majority of cases the elliptical wounds resulting from excision can be closed, owing to the mobility of the scalp, if all layer sutures are used with superficial sutures between. It is well to work from each end in tying the sutures. In cases where complete closure cannot be obtained by this method, one must not hesitate to use plastic means, to which the scalp is particularly adaptable. A successful and widely used method is by extension of the original incision to form a large U or S flap. The ends of the wounds may be sutured to reduce the amount of plastic necessary (Fig. 1). An S incision is made as indicated by the dotted line. The end A should extend well beyond a line drawn at right angles to the main axis of, and through the end of, the raw area. The scalp is undermined completely to any desired extent. This is easily done by thrusting a curved blunt

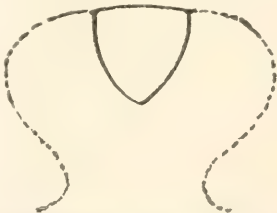


FIG. 1.—Diagram of plastic operation for triangular defect.

Fig. 1.—First stage of plastic operation for closure of an elliptical loss of tissue in the scalp, showing line of incision for detachment of flap.

pointed scissors, concavity toward the skull, between the aponeurosis and pericranium, opening the blades and withdrawing. Here and there it may be necessary to cut resistant strands of tissue. Suture at a-a' to see how the flap comes up. Sutures at the base of the flap should be inserted obliquely as at b-b', c-c': when tied they help to remove tension. When fully sutured there should be little tension; if there is much the scalp should be scarified repeatedly between the sutures, sufficiently to draw blood. The line of sutures lies frequently completely to one side of the wound in the dura. Thus this method has an advantage over that of turning down a flap, and is no more elaborate.

For a triangular defect, proceed as shown in Fig. 3.

The operation necessary in the majority of head injuries is a comparatively simple one. If preceded by infiltration of the scalp with local anesthetic and adrenalin, hemorrhage and shock are obviated to a very great extent and the operation made even more simple. The dangerous hemorrhage which may occur from large flap incisions is entirely prevented by this infiltration of the incision area with adrenalin solution, and, if some local anesthetic has been added, the amount of general anesthetic required is negligible. All serious cases should be kept at the casualty clearing station for two or three weeks after operation, and even longer if one is not quite satisfied with their condition.

MEDICAL PROBLEMS ON THE ITALIAN FRONT.*

By VICTOR G. HEISER, M. D.,

New York,

Director of the East, International Health Board; Member of the American Red Cross Mission to Italy.

Professor Heiser said that he had found that persons who were sent abroad on missions to various countries returned with a spirit of ardent partisanship towards the country they had gone to visit, in spite of accidents and hazards which they might have encountered. Diplomats who were sent to Russia were enthusiastic for the great democratic ideals which they were convinced would emerge triumphant from the present Russian chaos. Those who, like himself, had visited Italy, refused to believe in her ultimate overthrow. He thought it would be better to present to his audience a few salient points which had come under his personal observation during his mission, and let these facts speak for themselves.

The Italians had shown themselves efficient to an extraordinary degree in their medical organization. Italy, when she went to war, was more unprepared than any other of the belligerent nations. She possessed no x ray apparatus that was not of German manufacture and no ammunition and no automobiles that did not come from that source. Since the onset of the war, however, Italy had manufactured all the motor trucks and automobiles for her own use, and the fact that she had as many motor trucks for

transportation as any of the other allied nations would prove the immensity of the task which she had set herself. Not this alone had been accomplished, but in addition considerable exportation of cars had been made to France and to America. Some motor factories were also engaged in the manufacture of airplanes, the quality of which were well evidenced by the efficiency of the Caproni machines. Not a single battleplane had been constructed in the United States for Italian use. The English Government had offered America every inducement to manufacture battleplanes on a large scale, but the offer had not been taken up. Italy, on the other hand, had produced them by the dozen for army use and led the world in this respect.

Since the outbreak of war Italy had had to face very serious sanitary problems. Cholera had been carried into the Italian camps by Austrian prisoners and the Italian medical service had found it necessary to vaccinate the entire army against cholera. The laboratory staff had had to make examination of the stools of all the soldiers and prisoners who had passed through infected districts. Americans were accustomed to think that they led the world in the performance of large tasks, but the task of examining microscopically as many as 3,000 stools a day would appear enormous to the sanitary authorities here. This was what the Italian medical service had accomplished. In regard to the question of quarantine, the organization by the Surgeon General in this country of an institution capable of handling 2,000 quarantined inmates was considered very large, but it was a mere bagatelle compared to the necessity of quarantining enormous numbers of troops which was placed upon the Italian Government. During the war all the troops, French, British, etc., returning from Saloniki, were obliged to pass through southern Italy, on account of the dangers of the sea passage. The blood of all these soldiers was examined for malarial plasmodia, besides the examination made for other diseases. The Italian quarantine for the British accommodated 20,000 persons, and that for the French 40,000; numbers which exceeded those of other similar undertakings.

In regard to the organization on the Italian front, their medical men had here exhibited the most praiseworthy resourcefulness. The general idea in America was that the Italians did not accomplish very much, but they had completed hospitals whose united capacity amounted to 1,000,000 beds. America, with a population three times as large as that of Italy, had been 100 years in building hospital accommodation for 30,000 beds, while Italy had constructed a much larger number in six months. At the same rate, America would have to get 3,000,000 beds in that time. The construction of the Italian hospitals left nothing to be desired in workmanship and efficiency. No luxuries were to be found, but all the essentials were there. Practically no tents were in use, although the British and French hospital authorities were still relying largely on tent accommodation for their wounded. The construction of an Italian hospital unit cost less than a tent and was much more durable. The average unit was a building six feet by twelve feet, by fourteen feet

*Abstract of an address delivered December 21, 1917, at the annual meeting of the American Association for the Advancement of Science, Section K, Preventive Medicine, at Pittsburgh, Pa.

high. It was built of fireproof tiles; it was cool in summer, warm in winter, sanitary, and efficacious. The construction could be increased to accommodate any number of patients. In some centres there were as many as 40,000 beds. Buildings which handled the same number in France were represented by a somewhat heterogeneous collection, but in Italy even a pleasing and consistent style of architecture had been evolved. Hospitals were dedicated to the care of special injuries, such as fractures of the lower extremity, jaw wounds, wounds of the lung, etc., where special care and study were given to the defect. In regard to the last Italian records on lung surgery showed a mortality of only five per cent.

The problem of the mobile hospital had been worked out to perfection. By means of a 150 bed hospital equipment, which when taken apart was carried on five motor trucks, it was possible for an operating surgeon to travel seventy-five miles in sixteen hours from the point of the last base for operation. In this way he was able to take with him his personnel and staff of nurses, and was ready to set up the unit and operate again at the end of the journey. These mobile hospitals were operated at one third of the cost expended by the other belligerents. The Carrel-Dakin and all other modern techniques were employed. A word should be said in regard to prosthetic treatments, as the Italians had proved most adroit manufacturers in devising methods for human reconstruction. Much had been published concerning the work of the Roehampton Hospital in England, but the Marguerita Hospital in Rome far exceeded it in the production of ingenious appliances. In Bologna a man was interviewed who had lost his eyesight and also both hands, yet he was fitted with an appliance which enabled him to feed himself with a knife, fork, and spoon! The problems of rationing the troops was dealt with quite as efficiently as the work of hospitalization. The Italian soldiers were able to get hot food in the front line trenches. This was cooked at 8 a. m. by means of fireless cookers, and was ready at 11 a. m. to be served hot. The efficient manner in which this was carried out was perfectly marvellous.

These unfortunate people had recently suffered terrible reverses, but those who had visited them and studied their methods refused to believe in their ultimate overthrow. One point was strongly in their favor, and in this they differed from the Allies, English and American alike. The English and the Americans were accustomed to boast of what they were going to accomplish, and then afterward go and do it; the Italian, on the contrary, went and did the thing, and then perhaps mentioned his efforts afterward.

Enrollments of dental students in the naval Hospital Corps Reserve have been suspended, a sufficient number of embryo dentists having been obtained to meet the navy's needs for the present. About 300 students of this class were enrolled. Enrollment of medical students will continue indefinitely, under the same conditions as enrollments have been conducted for the reserve during the past few months.

MEDICAL NEWS FROM WASHINGTON.

Controversy on the Number of Commissioned Officers in the Medical Corps.—Plans for Instruction of Members of the Dental, Sanitary, and Veterinary Corps at Fort Oglethorpe.—Medical Educative Chart and Pamphlets for Display on Army Transports.—Plans for Proposed Pharmaceutical Corps in the Army.—Bill for Reorganization of Dental Corps of the Navy.

WASHINGTON, March 4, 1918.

There has been considerable controversy, and much confusion in the War Department over the number of officers that may be commissioned in the Medical Corps of the regular army. The number of regular medical officers is dependent upon the authorized enlisted strength of the regular army, Section 10 of the national defense act of June 3, 1916, providing that "the total number of such officers shall approximately be equal to, but not exceed, except as hereinafter provided, seven for every 1,000 of the total enlisted strength of the regular army authorized from time to time by law." There have been conflicting decisions as to exactly what the authorized enlisted strength of the regular army may be considered as a basis of ascertaining the number of Medical Corps officers allowed, and they have added to the confusion. As a result of one decision, a strength of approximately 300,000 was used as a basis, the numbers in the several grades were adjusted on that basis, and as a result some officers were nominated, confirmed by the Senate, and commissioned in higher grades. The medical officers were not satisfied with this basis. They maintained that the temporary strength prescribed from time to time for the Signal Corps in accordance with the aviation act of July 24, 1917, should be included in computing the strength of the regular army for determining the allowance of officers of the Medical Corps, and that a strength of approximately 450,000 should be used at this time as a basis.

The matter was reconsidered by the judge advocate general of the army and the general staff, and now it has been decided that the temporary strength of the Signal Corps and some other factors proposed by the Surgeon General's Office should not be included, and that the number of officers of the Medical Corps should be determined on a basis of about 213,000 enlisted men in the regular army. With a computation of the allowance on the latter basis, it has been found that the number of medical officers commissioned in higher grades exceeds the legal allowance. Now it is a question what may be done in the cases of these superfluous officers. The commissions having been issued after confirmation by the Senate, they cannot now be recalled, and naturally the officers affected are reluctant to surrender them and return to lower rank. So far as has been determined, it probably will be necessary to carry them in these grades as supernumeraries to be absorbed later as vacancies occur.

* * * * *

Plans for enlarging the scope of work at the medical officers' training camp at Fort Oglethorpe, Ga., so as to provide for instruction of other classes of the personnel of the Medical Department, such as the Dental Corps, Sanitary Corps, and Veteri-

nary Corps, have been completed, and they now are awaiting approval of the Secretary of War. The scheme contemplates a gradual enlargement of the facilities and scope of work at Fort Oglethorpe to the end that the educational system of the Medical Department, so far as it may be conducted at a training camp, eventually will be concentrated at that place, with a corresponding diminution at other camps. Commissioned and enlisted members of the Dental Corps, Dental Reserve Corps, Sanitary Corps, and Veterinary Corps will be put through special courses of instruction pertaining to their special work. At present there are about 1,500 officers and 9,000 enlisted men of the Medical Department at Fort Oglethorpe. A similar camp has been conducted at Fort Riley, Kans., where there are about 1,000 officers and 6,500 enlisted men. Although it is not intended to discontinue the Fort Riley camp immediately, it gradually will be reduced as that at Fort Oglethorpe is enlarged.

Special attention has been given by Major William H. G. Logan, M. R. C., in charge of the dental branch of the Surgeon General's Office, to preparing the scheme of instruction of dentists at Fort Oglethorpe. The first class of dental officers will be sent to the camp for a two months' course of instruction commencing on March 15th. Special buildings will be erected for conducting the instruction in dental subjects. The course will include military instruction to be conducted by the military staff of the medical officers' camp and special dental subjects will be handled by a staff of dental instructors. About eighty-five dentists will be sent to the camp each month, of whom all that can be spared from their present duties will be recent appointees to the regular Dental Corps, with a sufficient number from the Dental Reserve Corps to make up the prescribed number. Lieutenant Colonel John H. Snapp, Dental Corps, has been relieved from duty at Camp Upton, N. Y., and assigned to duty as senior dental instructor at the camp. He will be assisted by several members of the Dental Corps and by a staff of members of the Dental Reserve Corps who have had experience, before entering the military service, as special instructors at dental colleges.

* * * * *

The naval Bureau of Medicine and Surgery is preparing an illustrated chart to be displayed conspicuously on board army transports warning soldiers against spread of disease. The chart was devised by Surgeon W. D. Owens, of the navy, who first used the sketches in warning the naval recruits at the naval training station, Newport, R. I., where excellent results were obtained, particularly in pointing out to the newcomers the dangers of venereal infection and neglect of the proper sanitary measures. Besides issuing the charts, the sketches and cartoons, with brief explanatory legends, will be compiled in pamphlet form and distributed among soldiers transported overseas.

* * * * *

The Secretary of the Treasury has recommended extension to officers of the Public Health Service engaged in the enforcement of sanitary measures in the vicinity of national cantonments the priv-

ileges of a pending bill that provides that all uniforms, accoutrements, and equipment required for any officer of the military forces of the United States shall be furnished and issued to such officer by the Government at cost price. The secretary explains that the Public Health officers are uniformed by regulations of that service, and that they consequently suffer from the same exorbitant prices in purchasing uniforms as in the case of officers of the military forces. The number of officers that would be affected is about 300. Their uniform is olive drab, and it differs from that of the military forces only in the insignia and buttons. In view of the fact that these officers are engaged actively in protecting the health of the military forces, it is thought that they are entitled to the same consideration as the officers of the military forces.

* * * * *

Considerable interest has been manifested in the pending bill to establish a Pharmaceutical Corps in the army and an effort will be made to get a favorable report on it from the House Military Committee. If the proposed legislation is enacted the corps will be a part of the Medical Department of the army, and under the immediate supervision of a pharmacist, to be known as the pharmacist director. Appointments to the new corps will be made from civil life, from among graduates of recognized schools of pharmacy, original appointments being made in the grade of second lieutenant. Men with pharmacist experience may be enlisted between the ages of seventeen and thirty-five years as pharmacist apprentices, and after a service of two years they may be granted leaves of absence to pursue courses of instruction in pharmaceutical schools to prepare for commissions in the corps. It also is provided that contract pharmacists may be appointed at a compensation of \$150 a month.

* * * * *

Senator Tillman, of South Carolina, chairman of the Senate Naval Committee, has introduced a bill to reorganize the Dental Corps of the navy. The bill authorizes the President to appoint and commission dental officers in the navy, at the rate of one for each 1,000 of the total authorized number of officers and enlisted men of the navy and marine corps, in the grades of assistant dental surgeon, passed assistant dental surgeon, and dental surgeon, who shall constitute the naval dental corps. The number authorized differs from the number of dentists allowed the regular army, in which the number is one for every thousand of the enlisted force. It is provided that dental surgeons shall be eligible for advancement in pay and allowances, but not in rank, to and including the pay and allowances of a captain, except that the number of dental surgeons with such pay and allowances shall not exceed 4.5 per cent. of the total authorized number of dental officers. It also is provided that not to exceed eight per cent. of the dental officers may be advanced to the pay and allowances of commander. Officers of the naval Dental Corps are made eligible for retirement in the same manner and under the same conditions as now prescribed by law for officers of the naval Medical Corps, except that they shall not be entitled to rank above lieutenant commander on the retired list or to retired pay above that of captain.

Editorial Notes and Comments

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SCABIES AMONG SOLDIERS

While it is true that skin diseases seldom offer any danger to life and consequently cannot be classed among the serious disorders which threaten soldiers such as tuberculosis and pneumonia, still these affections are painful and disfiguring and keep the soldier off the firing line for a length of time out of all proportion to their gravity. The British commission which investigated the matter found that the average time a soldier was away from the front for a skin disease was thirty-one days—the average, mind you, not the extreme cases. Of all these affections, scabies is one of the most common, most painful, most disabling, and difficult to treat.

Several fallacies at once come to mind in connection with scabies. In the first place, it is believed too generally that the pathognomonic symptoms are lesions on the back of the hand, especially burrows between the fingers. As a matter of fact, these burrows can only be demonstrated in about ten to fifteen per cent. of all cases. The British commission found them in fourteen per cent.; skin specialists in this country report them in nine or ten per cent. The hands of soldiers are remarkably free from le-

sions, as they are in outdoor workers everywhere.

Of all the remedies for scabies three stand out: balsam of Peru, sulphur, and beta naphthol. It is surprising to observe that the British experts seem to regard the high cost as the only objection to balsam of Peru. As a matter of fact, this remedy is so irritating to nine patients out of ten, that a dermatitis will be set up, and when a dermatitis develops during the course of scabies, one must needs have the persuasive powers of a Jerome, a Black or a Delmas, to persuade the patient that his scabies is not getting worse. Beta naphthol is a good remedy, but it also is open to the objection that it is irritating to the skin of many persons. So we come back to the old classical remedy of sulphur, which, by the way, cannot just be slapped on haphazard, but must be applied intelligently. First of all the horny layers of the skin must be dissolved; green soap is probably the most convenient and effective agent for the purpose. Then the sulphur can be applied directly to the burrows harboring the parasites. Patients receiving the sulphur treatment should be kept under constant supervision. Now and then cases are reported which do not seem to improve under this treatment, no matter how faithfully it is carried out. In such instances, we must make sure that we are not diagnosing as scabies some such condition as a papular urticaria.

Disease cannot be treated by rote, even if we have such an apparently well understood disease as scabies and even if patients have to be treated in large numbers. A military surgeon who is the slave of such a formula as "burrows between fingers—scabies—sulphur" will not be as useful to his country as one who studies and analyzes his problems as they arise.

LIMITATIONS IN OUR KNOWLEDGE OF EPINEPHRINE.

A critical review of the vast amount of published material on theories and experimental work upon the suprarenal glands clears the ground for continued action upon the problem of their importance. Rogoff (*Liberation of Epinephrine from the Adrenal Glands, Journal of Laboratory and Clinical Medicine*, January, 1918) presents the few facts that have so far been established in animal experimentation, and states even their failure to throw any definite light upon the functional questions involved.

The existence of an active substance secreted by the glands and its nature as a blood pressure raising principle have long been subjects of investigation and have gradually become established as facts. Furthermore the ability of this substance to produce the same effect upon sympathetically innervated structures as that caused by electrical stimulation of their nerve supply has been clearly demonstrated. This knowledge permits the use of certain of these structures for the detection and estimation of epinephrine. A delicate test is obtained with a segment of rabbit's intestine, which, when brought into contact with blood containing epinephrine, is inhibited in tone and contracts, while a segment of uterus used to corroborate the presence of epinephrine, manifests the opposite effect, or increase in tone. It is important to discover whether the adrenal glands discharge into the blood passing through them a substance which influences the blood pressure in the same way in which it is affected by extracts of the glands. Blood may therefore be withdrawn from the adrenal veins and applied to biological test objects or injected into the circulation of another animal. Both of these methods have indicated the presence of epinephrine as a secretion product during stimulation of the splanchnic nerves. By careful elimination of other factors, it has been found that rise of blood pressure was produced when the adrenal veins were left open while the splanchnic nerves were stimulated, and no effect appeared when these veins were clamped off. Eye reactions under the same condition of liberation or non-liberation of adrenal blood confirm the same result.

Spontaneous liberation of epinephrine, without artificial stimulation, forms the next question for demonstration. A smaller rise of blood pressure is caused by adrenal blood in the absence of splanchnic stimulation, while section of the splanchnic nerves produces a marked diminution of the effect of the secretion. Careful collection of the adrenal blood in a vena cava pocket and its subsequent release into the circulation permitted the determination of the rate of blood flow through the adrenals and of the liberation of epinephrine. Spontaneous liberation was no longer detectable after complete section of the nerves supplying the adrenals, while it could be reintroduced by electrical stimulation of the cut ends of the nerves.

No experimental proof has been given that the liberation is increased by trauma or other experimental conditions, nor any reliable evidence that increased secretion results from emotional dis-

turbances, asphyxia, and other such influences. It may be that changes thus resulting in the circulation may alter the concentration of epinephrine in the blood, but this need not indicate a change in the rate of liberation. Careful experiment by the author has thus far shown no such change. The symptoms of apparent increased action of epinephrine in animals under the influence of fright can be elicited when the epinephrine supply is almost or entirely cut off. Animals in which the epinephrine supply is reduced to a very small amount or is even impossible of detection continue to live in excellent health and to respond normally to emotional disturbances.

The emergency function of the adrenals has not been established. The dependence of sugar mobilization upon the epinephrine output cannot be substantiated since experimental hyperglycemia can be produced by usual means even when epinephrine has been reduced to a minimum. It is probable, from the condition and behavior of cats with practically no epinephrine secretion from the adrenals, that this substance is not absolutely essential to life and health. It may be, but this has not been proved, that chromatin tissue throughout the body liberates epinephrine and also that there is some other substance necessary to life in the secretion of the adrenals.

The limited state of knowledge, Rogoff points out, of so potent a substance as epinephrine, should render any clinician very cautious in resorting to adrenalectomy or other measures of relief, until more extensive and conclusive investigation has been accomplished.

DOES THE CARREL-DAKIN METHOD GIVE US A NEW TREATMENT?

Probably the first, certainly the most insistent, problem which the military surgeons of France and England were called upon to solve was such an unprecedented and unanticipated number of wounded in the first battles of the war that often great rows of them lay for twenty-four hours with no other care than that offered by a man who passed down the lines with drinking water every hour. Naturally appalling infections were the rule, especially as this warfare was waged on ground covered with manure highly fertile and teeming with microorganisms. Infections made their appearance and became commonplace that had been looked upon almost as surgical curiosities; gas and fecal bacilli were prevalent. The situation is now well enough in hand so that nearly all wounds are thoroughly

cleansed, and under the Carrel-Dakin method heal rapidly.

The question is whether this method, or any other, can be taken as the best in all cases. Let us consider, with no thought of depreciation of the admirable work of these men, whether or not we shall adopt this treatment as the invariable one in dealing with infection. There is a whisper abroad that some of the results which seem ideal are obtained in cases where this method, with all its ingenious complexities, need not have been used at all. The same suspicion attaches to the other methods—the Morison, with its carbolio acid and alcohol, followed by bismuth and iodoform; Hey, with its brilliant green, boric acid, paraffin, and chalk—why chalk, no one knows; the methods of Sir Berkeley Moynihan, who dissects back a third of an inch of tissue and then uses dichloramine-T, and Colonel Gray's liquid paraffin procedure.

After all, if we will but turn our attention nearer home, we will see much to commend in the systematic and rational work of Ochsner, which he reported in two papers read before the Southern Surgical Association last December. The great point was made that an antiseptic need not necessarily be a germicide, e. g., he found a saturated solution of boric acid a specific against the streptococcus. One drop of pus from a streptococcic abscess killed a guineapig which survived sixty drops from such an abscess where compresses saturated with boric acid solution had been applied to the skin just over the abscess. He also found that this antiseptic was inimical to the *Staphylococci albus* and *citreus*, but not to the *aureus*, *gonococcus*, and others.

The spectacle of various equally renowned surgeons advocating diverse treatments of infected wounds is more intelligible when we reflect on the well known idiosyncrasies of antiseptics, the personal equations of the surgeons, the cleansing of the wound common to all these methods, and so on. No one denies that excellent results are obtained by the Carrel-Dakin method, but whether or not its meticulousness is justifiable, when such excellent results are reported from far simpler methods, is another question.

A NEW WAY TO COLLECT OLD DEBTS.

Litigation invariably engenders ill will. The man sued and the man suing are sure to leave the court dissatisfied and at enmity whatever the verdict. Law, like war, hurts both sides. Therefore, it is wise to follow the advice of Abraham

Lincoln: "Discourage litigation. Persuade your neighbors to compromise whenever you can. Point out to them, how the nominal winner is often a real loser, in fees, expenses, and waste of time."

Realizing these facts the judges of the municipal court of the City of New York have devised a scheme for conciliation and arbitration which will undoubtedly commend itself to many physicians as being preferable to the ordinary processes of law for the collection of debts due them. There is probably no class of professional men whose proportion of losses by bad debts is so high as that of the physician. The man who can collect fifty per cent. of the debts due him feels that he is doing fairly well and the one who can increase the collections to seventy-five per cent. is quite proud and haughty about it. Even where the percentages of collections run higher than this, the physician himself generally does not get any more than the proportion named, the difference going into collection fees. Therefore, the scheme for conciliation and arbitration should appeal very strongly to physicians. Under the rules adopted by the justices the person desiring the services of a justice for conciliation may apply to the clerk in his district for the issuance of a note of conciliation. This notice will state the sum involved and request the appearance of the debtor at the court at a stated time "for the purpose of an amicable adjustment of the controversy." The parties to the controversy are received by the justice in his private office, are heard informally, the justice explains the law in the case, and makes some suggestion for a settlement which may not even be in strict conformity with law. If the parties agree upon a settlement the clerk makes a record of the agreement and the matter ends, without cost to either party for court or attorney's fees. An arbitration is conducted in the same way except that prior to beginning an arbitration both parties specifically agree to abide by the decision of the justice, whereas in a conciliation no such agreement is made in advance, the parties to the controversy reserving the right to accept or reject the decision of the justice as they deem best. In either case the parties to the controversy may select the particular justice before whom they wish to appear.

This method of disposing of controversies in court promises a much needed relief to the physician who can ill spare the time to appear in court under the present method, when he may be required to attend court on several different occasions before his case comes on the calendar.

Under either the conciliation or arbitration method a definite time will be named when the hearing is to be held so that there will be no loss of time on the part of either party to the controversy. We commend the trial of these methods to physicians who have hitherto refrained from pressing collections either on account of the fear of making enemies or of wasting time by appearing in court.

SAVE ALCOHOL, GLYCERIN, AND SUGAR.

Several popular drugs are no longer obtainable, while the prices of many have been carried to fabulous figures by the war. We are just beginning to feel the effect of war on the three ingredients which enter into the composition of more different medicinal preparations than any others. Alcohol is present in many liquid medicinal preparations, probably the majority. Ignoring those which contain only a small proportion of this ingredient, we find that there are 131 preparations in the United States Pharmacopœia and 237 in the National Formulary which contain more than 10 per cent. of alcohol; that glycerin appears in twenty-five formulas of the United States Pharmacopœia and in eighty-one of the National Formulary; and that sugar is an ingredient in thirty-five Pharmacopœial and 151 National Formulary preparations. All three of these ingredients are scarce and are becoming more expensive and difficult to obtain.

Great Britain has found it necessary to prohibit the use of glycerin altogether in toilet preparations, and a number of preparations containing one or all three of these ingredients have been removed from the British Pharmacopœia for the time being, and in many cases succedanea, or alternative formulas, have been provided. Some such step may become necessary here; indeed, the shortage of sugar has already made itself felt in the drug store to such an extent that concerted action has been taken by the pharmacists of New York, Philadelphia, and several other cities to supply the needs of the pharmacist. In New York city alone the retail druggists use some 20,000 pounds of sugar weekly in medicines of various kinds.

Physicians can give material relief in this emergency by prescribing forms of medicines which do not contain any of these ingredients. It may be necessary for the present to abandon the elegant pharmacy which has developed during the past third of a century and revert to the simpler but equally efficacious, if less palatable, forms of our fathers. Pills, powders, and de-

coctions must take the place of tinctures, elixirs, and syrups. Castor oil or epsom salt must supplant solution of magnesium citrate and bitter flavors be substituted for sweet. Indeed, bitter or acid medicines, provided the taste is not too lasting, are not disagreeable to many. By a little forethought in this direction, prescribers can effect a material economy where economy is needed.

Obituary

THOMAS J. MAYS, M. D.,
of Philadelphia.

Dr. Thomas J. Mays died on February 14th of apoplexy at his home in Philadelphia at the age of seventy-two years. Doctor Mays received his medical doctor's degree from the Jefferson Medical College in 1868, and after practising in this country for a few years went abroad to continue his studies on physiology and diseases of the chest. He returned to this country in 1885 and resumed practice. From 1888 to 1902 he was professor of diseases of the chest in the Philadelphia Polyclinic Hospital. In 1890 he was instrumental in the organization of the Rush Hospital for Consumptives and in 1908 of the Philadelphia Clinic for the Home Treatment of Consumption and was medical director of the latter institution until his death. He was also visiting physician to St. Mary's Home for Aged Women and consulting physician to the Institution for the Feeble-minded at Vineland, N. J., and was a member of the American Climatological Association, the American Neurological Association, the Philadelphia College of Physicians, the Philadelphia County Medical Society, the American Medical Association, and the Pennsylvania State Medical Society. Doctor Mays was the author of *Pulmonary Consumption, a Nervous Disease, Therapeutic Sources, and Consumption, Pneumonia, and Their Allies*, and contributed generously to current medical literature. The NEW YORK MEDICAL JOURNAL was privileged to publish many articles by Doctor Mays and itself feels the loss of a good friend, which will be shared by the profession.

SAMUEL GIBSON DIXON, M. D.,
of Philadelphia.

Dr. Samuel G. Dixon, commissioner of the Pennsylvania State Department of Health since 1905, when the department was created, died on February 26th at the University of Pennsylvania from anemia. Doctor Dixon is credited with having placed Pennsylvania among the foremost states in public health work. Doctor Dixon was born in Philadelphia, March 21, 1851. He was educated for the practice of law, but later decided to study medicine, graduating with honors from the University of Pennsylvania in 1866. He studied abroad, was a professor of sanitary engineering at the University of Pennsylvania and later professor in and then president of the Academy of Natural Sciences.

News Items.

Yale Medical School Now Has Adequate Endowment.—According to the announcement of President Arthur Hadley, of Yale University, the Yale Medical School now has at its disposal the sum of \$2,568,812, donated through the generosity of its friends. This endowment insures the perpetuation of the school and makes possible its affiliation with the New Haven Hospital.

Navy Base Hospital Reaches War Zone.—It is reported that a Navy base hospital which is made up of physicians, nurses, and enlisted personnel from the Naval Reserve Force of Leland Stanford University, Palo Alto, Cal., has just reached the war zone. It is prepared to take care of the Navy force and if accommodations are sufficient, the Allied and our own Army sick and wounded as well.

Gifts and Bequests to Hospitals.—By the will of General Horace W. Carpentier, who died on January 31st, the Presbyterian Hospital will receive \$300,000; the Sloane Maternity Hospital, \$80,000; Saratoga Homestead Sanatorium for Tuberculosis, \$40,000; Medical Department of Columbia University, \$50,000 for Dr. Reuben C. Carpentier's use in the school; Columbia University, \$200,000 for the Edward R. Carpentier Memorial Fund. The will contains bequests to a number of charitable institutions, and the residuary estate is given to the trustees of Columbia University and Barnard College, share and share alike.

By the will of the late Mrs. Charles H. Coburn, of Milford, Mass., Harvard Medical School will receive \$100,000 for research in tuberculosis.

Volunteer Medical Service Corps to Be Organized by the Council of National Defense.—A Volunteer Medical Service Corps to include those physicians and surgeons not eligible to membership in the Medical Reserve Corps has recently been authorized by the Council of National Defense. It is proposed that the services to be rendered by this new corps will be in response to a request from the Surgeon General of the Army, the Surgeon General of the Navy, the Surgeon General of the Public Health Service, or from any other authorized departments. A committee of the General Medical Board of the Council of National Defense is to constitute the governing board, and the state committee of the medical section of the Council of National Defense is to be the governing board in each state.

Personal.—Dr. A. I. Ringer, formerly assistant professor of physiological chemistry at the University of Pennsylvania, has been appointed special consultant in diseases of metabolism at the German Hospital, New York, city.

Dr. Louis Borsch, formerly of Philadelphia, and now a resident of Paris, was recently decorated by President Poincaré with the Legion of Honor, in recognition of his services as eye surgeon at the hospital of Grand Papais, in the Champs Elysées.

Dr. William J. Robinson, of New York, was recently arrested, charged with violating the espionage act, and held in \$5,000 bail for a future hearing.

Dr. Martha Tracy has been elected dean of the Woman's Medical College of Pennsylvania. Doctor Tracy has occupied the chair of physiological chemistry and hygiene at the college for a number of years and has been acting dean since June, 1917.

Dr. Edward K. Dunham, Major, Medical Reserve Corps, United States Army, delivered the five Herter lectures at University and Bellevue Hospital Medical College, January 7th to 11th, his subject being Principles Underlying the Treatment of Infected Wounds.

Dr. Mosen Behrend, of Philadelphia, has been elected a member of the Board of Directors of the Philadelphia County Medical Society, to fill the unexpired term of Dr. Frank C. Hammond, who resigned recently.

Dr. Rose Hirschler has been appointed chief of a department for the treatment of venereal diseases in women and children, which is to be opened in the College Hospital of the Woman's Medical College of Pennsylvania. In the equipment and maintenance of this new department, the Woman's Hospital, the West Philadelphia Hospital, and the College Hospital will cooperate.

Meetings of Medical Societies to Be Held in Philadelphia during the Coming Week.—Monday, March 11th, County Society, Board of Directors, Physicians' Motor Club Reception, Samaritan Hospital Medical Society; Tuesday, March 12th, Pediatric Society; Wednesday, March 13th, County Medical Society; Thursday, March 14th, Pathological Society; Friday, March 15th, Logan Medical Association.

Executive Committee of the General Medical Board of the Council of National Defense.—The following are the officers of the Executive Committee of the General Medical Board of the Council of National Defense: Chairman, Dr. Franklin Martin; vice-chairman, Dr. F. F. Simpson; secretary, Dr. William F. Snow; and Surgeon General Gorgas, U. S. A.; Surgeon General Braisted, U. S. N.; Surgeon General Rupert Blue, Public Health Service; Dr. Cary T. Grayson, Dr. Charles H. Mayo, Dr. Victor C. Vaughan, and Dr. William H. Welch.

Army Transports as Hospital Ships.—Twenty-two U. S. transports have been taken over by the Navy Department, and are to be equipped as "medical transports as well as transports for troops," according to the statement made by Surgeon General William C. Braisted, U. S. N., at a recent hearing before the House Committee on Naval Affairs. These transports have been equipped by the Bureau of Medicine and of Surgery of the Navy and are to be used to convey soldiers invalidated abroad in this country, where they will be taken charge of by the Army.

More Lenses for the Navy Needed.—Although more than 20,000 binoculars, spy glasses, telescopes, chronometers and sextants have been received by the Navy in answer to the appeal sent out by Secretary Roosevelt some time ago, many more will be needed to meet the demand. It should be understood that opera glasses are not suitable for this work, and that only binoculars, spy glasses, telescopes, chronometers and sextants should be contributed. The owner should place his name and address on each article, so that the Navy may keep a complete record. Articles should be sent to Franklin D. Roosevelt, Assistant Secretary of the Navy, care of the Naval Observatory, Washington, D. C. These instruments are for the use of watch officers serving on vessels in the war zone.

Meetings of Medical Societies to Be Held in New York during the Coming Week.—Monday, March 11th, New York Ophthalmological Society, Society of Medical Jurisprudence, New York, Williamsburg Medical Society, Brooklyn; Tuesday, March 12th, New York Academy of Medicine (Section in Neurology and Psychiatry), New York Obstetrical Society; Wednesday, March 13th, New York Pathological Society, New York Surgical Society, Alumni Association of Norwegian Hospital, Brooklyn, Medical Society of the Borough of the Bronx, Richmond County, N. Y., Medical Society, Brooklyn Medical Association; Thursday, March 14th, New York Academy of Medicine (Section in Pediatrics), West Side Clinical Society, New York, Brooklyn Pathological Society; Friday, March 15th, New York Academy of Medicine (Section in Orthopedic Surgery), Clinical Society of the New York Post-Graduate Medical School and Hospital, New York Microscopical Society, Alumni Association of Roosevelt Hospital.

Organization of the Base Hospitals in the Divisional Camps Abroad.—The Army Medical Department has announced the organization of the base hospitals as they will be constituted in actual use abroad. The first section of the first fifty of these base hospitals, organized by the Red Cross, were gathered about the staffs from the hospitals and medical schools of the country. The personnel, selected by one of the leading surgeons, consists of thirty-four medical officers, 100 female nurses and 200 enlisted men for 1,000 beds. An officer from the Medical Department of the Army was placed at the head of each base hospital, the unit from the Massachusetts General Hospital excepted. The Office of the Surgeon General now has in process of organization the next fifty base hospitals, and the medical and surgical personnel of these new units, selected by the Medical Department, are to be sent to Fort Oglethorpe or some other medical training camp for the requisite training. Each unit will be in charge of a medical officer of the Regular Army. Attached to each division of the Expeditionary Force are several base hospitals, each capable of being expanded to meet any increased demand.

Modern Treatment and Preventive Medicine

A Compendium of Therapeutics and Prophylaxis, Original and Adapted

TREATMENT OF SLEEPLESSNESS.

By LOUIS T. DE M. SAJOUS, B. S., M. D.,
Philadelphia.

(Continued from page 421.)

Among the toxic forms of sleeplessness, that due to alcohol figures prominently, though its incidence varies considerably in accordance with the amount taken, the extent of habituation, and other factors. While a "reflex" stimulating action of alcohol on the nervous centres is well recognized, careful studies of its effects on the higher brain functions have led to the conclusion that most of the apparent stimulation produced in the cerebral sphere is not due to direct excitation but to a depression of the centres concerned with selfcontrol and the maintenance of a conventionally correct behavior. Our knowledge of the actions of alcohol on the circulation, however, is such as to suggest strongly a marked influence on their part in the production of sleeplessness. Apart from the use of sufficient alcohol to bring on pronounced drunken depression, this agent so alters blood distribution, as a rule, that more blood is contained in the arteries and surface vessels, but less in the extensive venous system of the splanchnic area. The mean aortic pressure is, in general, slightly raised, the amplitude and force of the pulse increased (Sollmann), and the blood flow as a whole improved. Frequently the pulse rate is increased, reflexly or otherwise, and this increase, with the activation of the peripheral circulation in general, is apt to persist for several hours. As regards the cerebral circulation, Hirschfelder, 1915, observed dilatation of the vessels of the pia under alcohol, and a dilator effect was also noticed by Berezin, 1916. Thus the acute circulatory effects of alcohol, in an intermediate dosage, plainly seem calculated to hinder sleep induction. In so called moderate drinkers, ingesting alcoholic beverages daily but not to the extent of marked drunkenness, the sleep antagonizing effect is noticed especially where the amount of alcohol taken has been somewhat larger than usual.

Another, more serious, form of alcoholic insomnia is that resulting from prolonged heavy drinking and associated with delirium. While these and other cerebral manifestations of alcoholism are undoubtedly to be ascribed in part to direct injury of nervous tissue by the alcohol, there are some indications that effects of the poison on the bloodvessels may likewise be concerned. Degenerative changes in the vessel walls, with loss of elasticity and a tendency to rupture, are generally held an important result of chronic alcoholism. Not only are petechial hemorrhages in the gastric mucous membrane found after delirium tremens, and been ascribed by E. F. Hirsch, 1916, to direct toxic action on the vessels, but ecchymoses in the skin constitute also a typical result of alcoholic poisoning. Short of actual vascular rupture, a

weakening or paralysis of the brain arterioles as a result of the repeated action of alcohol has been considered by many, including Sir James Sawyer, 1912, a factor in alcoholic delirium, sleepless cerebral activity being held a natural result of the persistently dilated condition of these vessels. In lead poisoning, sleeplessness may occur during the attacks of colic, not only because of pain, but also through direct irritation of nervous tissue by the poison. The circulatory condition, moreover, is such, the vascular system as a whole being in spasm, as would maintain a full blood supply to the brain even during physical repose, insomnia being thus favored. Among the many other forms of toxic insomnia, that attending intestinal stasis is of special importance, being so frequently encountered. Sleeplessness and headache probably arise in a somewhat similar manner in these cases. The toxic materials causing these symptoms upon absorption into the bloodstream are considered usually to be either products of the action of bacteria upon food—chiefly protein food—or intermediate substances formed during the digestion of food by the secretions of the alimentary tract. Insomnia and headache might conceivably result either from direct excitation of nervous structures by the poisons absorbed or from a paralyzing action on their part upon the walls of the intracranial vessels. The known fact, however, that typical putrefactive amines may be set free through bacterial activity in the intestines suggests that a general rise in vascular tension is at times the main circulatory factor in these symptoms, the actions of the putrefactive amines being in many ways similar to those of adrenalin, but as a rule more pertinent. For the production of insomnia, we may note, the degree of vascular spasm required is only such as will present the sagging of blood from the brain to dependent portions of the body which is believed to occur normally in the period of sleep induction; for the production of headache, on the other hand, disregarding for the moment any direct irritating action of the poisons on intracranial tissues, a more marked disturbance of the general circulation may be presumed necessary, a painful degree of pressure on these tissues being exerted. Hence, possibly, the fact that in persons with intestinal stasis, a tendency to insomnia sometimes exists in the absence of all headache.

In febrile conditions in general, the state of the circulation is at times such as to favor sleeplessness. While, in most acute infections, hypotension exists at the height of the fever, and toxic material in the blood may eventually paralyze the vasomotor centre, an opposite condition usually exists in the earlier stages of the disease, the beginning intoxication exciting the vasomotor centre and also the contractile vessel walls themselves, thus tending to maintain or increase the intracranial circulation. The augmented heart rate of fever, and at the outset, the contraction of the skin vessels which takes place during

the rise in temperature, may likewise contribute to this end. Sleeplessness in the presence of renal impairment has been ascribed to high blood pressure due to intoxication of the nervous system by the poisons circulating in the blood. Similarly in gouty subjects, apart from insomnia due to pain, there may occur a persistent irritability, evidently of toxic origin, predisposing to wakefulness or at least to superficial or broken sleep. The rather close chemical relationship of the purin bodies to caffeine is of interest in this connection.

In the treatment of these toxic forms of insomnia, apparently in part excitative or directly nervous and in part congestive in origin, a number of different therapeutic objects can with advantage be sought, viz.: 1. The cause, such as alcoholic excess, lead intoxication, or the underlying factors of coprostasis or other toxic conditions should be removed. 2. Where removal of the cause can be effected but slowly or not at all, elimination of toxic material is an important palliative. In lead poisoning, the iodides may thus be of assistance. In the insomnia of fecal intoxication, frequent colonic flushings, intestinal antiseptics such as betanaphthol and phenyl salicylate, increased consumption of water, hydragogue cathartics, and systematic ingestion of bran, agar preparations, or mineral oil, are often productive of much good. In febrile, renal, and gouty intoxications, diaphoretic, diuretic, and cathartic measures, according to indications, are available. 3. To overcome the circulatory factor in toxic insomnia, warm baths or other applications of hydrotherapy, postural measures, light friction massage, and if necessary general vasodilator drugs, in particular the spirit of nitrous ether in moderate dosage, may be appropriate. 4. To promote directly the contraction of congested intracranial vessels the coal tar analgesics seem best adapted; ergot has seemed effectual at times, but its relative action on the general and the intracranial vessels is an uncertain quantity. 5. To overcome the excitative or directly nervous factor in toxic insomnia, as a temporary measure or where other means have failed, such drugs as the bromides, chloral hydrate, veronal, or trional may be required, always to be used in the smallest effectual dose and to be discontinued at the earliest possible moment.

(To be concluded.)

Use of a Fixing and Coloring Agent to Facilitate Primary Suture of Wounds.—Delbet (*Presse médicale*, December 17, 1917) presents a report concerning Le Grand's method of fixing and coloring contused tissues, before their excision, with a mixture of formaldehyde solution and methylene blue. His attention having been called to the danger attending contact of forty per cent. formaldehyde with exposed vascular trunks, Le Grand now uses a twenty per cent. solution only, in which is dissolved five per cent. of methylene blue. While even this solution is not entirely devoid of action on arteries, it cannot be further diluted or the proper coloration of the contused tissues will not appear. To protect arteries when exposed, therefore, Le Grand coats them with some fatty substance before using the formaldehyde mixture. Even a thin

layer of normal tissue overlying an artery, however, suffices to protect it from injurious action by the mixture. Nerves resist the latter much better than vessels. Over normal muscles the mixture forms only a species of varnish; but contused muscle tissue becomes impregnated with the mixture almost all the way through. Stress is laid on a detachment of normally adherent tissues in the vicinity of fractures or beneath the skin. Without the use of the fixing and coloring solution such detachments are passed by unobserved, and lead to failure of an attempt at primary wound closure. With it, they are at once detected. The mixture gives a much better idea of the exact tissues requiring excision and of the tissues which can be conserved. Le Grand's latest series of attempts at primary suture number 179 cases, with only ten failures, or 5.54 per cent. The wounds of the soft tissues numbered 112, with only 2.4 per cent. of failures. Six joint wounds without fracture were primarily sutured with uniform success. There were also twelve joint cases with fracture, again with uniform success. Of forty-nine fractures primarily sutured, all but seven, or 14.3 per cent., were successful; all the unsuccessful cases later recovered.

Indications for Operative Interference in Pre-eclamptic Toxemia.—W. G. Dice (*American Journal of Obstetrics*, January, 1918) states that in the majority of cases where the average blood pressure has been 120 to 130 millimetres Hg, dangerous toxemia is indicated if the pressure rises to 150. In Irving's statistics, among cases with a blood pressure of 150 to 160, in one out of three toxemia developed, while with a pressure exceeding 180, all became toxic. High pressure alone is a more frequent early sign of toxemia than albuminuria alone, and the pressure is not proportional to the amount of albumin. When a patient's blood pressure has gradually risen from 150 to 170, in spite of proper diet, rest, and eliminative treatment, and one or more other toxic symptoms co-exist, the time for expectancy is ended, whether the amount of albumin is large or not. A fluctuating, high blood pressure in toxemia is also of serious import, indicating marked derangement of the cardiovascular mechanism. Dice believes few men doing obstetrical work fully appreciate the importance of the eye symptoms, either from the standpoint of the patient's future vision or as an index of the degree of toxemia. The first objective sign is a haziness of the fine detail of the fundus, the edema of a beginning retinitis, and the uterus should be emptied before the initial stage is past. Rest, diet, and active elimination may possibly cause improvement of the eye, but when once the latter is involved, only careful daily observation of the case in a hospital can justify delay, and then only when all other symptoms improve and the eye condition does not extend. While no single symptom warrants interruption of pregnancy, two or more, properly interpreted, will usually enable one to act wisely. Some have emphasized epigastric pain in the later months of pregnancy, especially with high blood pressure, as an ominous sign. Persistent frontal headache, not relieved by cathartics, is also a danger signal.

Absorption and Excretion of Various Iodides.

F. J. Kaulhub and J. D. Pilcher (*Archives of Internal Medicine*, January, 1918) note that the use of strontium salts in therapeutics has been to some extent discouraged, it being thought that such salts are more slowly absorbed than the corresponding salts of sodium and potassium. Testing the excretion of strontium iodide in the human subject in comparison with that of sodium and potassium iodides, the writers found practically no difference in the rate of excretion of the three compounds. If anything, both the rate of excretion and the total excretion seemed to be slightly greater with the strontium salt than with the other two, though the difference is held to be immaterial. The excretion of strontium iodide not being slower, neither is its absorption to be considered slower, since all iodides are believed to exist in the blood and tissues essentially as sodium iodide.

Treatment of Malignant Skin Lesions with the X Ray.—Frederick B. Hall (*Urologic and Gynecologic Review*, February, 1918) maintains that it is necessary to give a sufficient dose because upon this depends the quickest results. The amount of x ray used is measured by means of a chemical pastille that changes its color under the action of the x ray. The effect upon the skin is read in terms of x . Ten x is the quantity of x rays that will cause an erythema of the skin. This can be produced in from thirty seconds to ten minutes, according to the hardness of the x ray, the amount of filtration between the skin and the tube, and the distance of the target of the tube from the skin. Sole leather or chamois skin must be placed between the skin and the metallic filters as secondary rays are generated when the x rays strike the filters and they are most irritating to the skin. With proper care by filtration it is possible and safe to give two or three times the erythema dose of ten x . As high as twenty x has been given as a routine. An interval of two weeks must elapse between treatment to allow the skin reaction to subside entirely.

Modification of Carrel's Tube to Avoid Pressure.—H. Driffield Levick (*British Medical Journal*, December 8, 1917) directs attention to the well known fact that more or less prolonged contact with the tissues in a wound of drainage tubes is prone to produce some degree of pressure necrosis. This has led to the abandonment in great measure of the use of this form of drainage, but the Carrel technic requires the use of tubes and it has been shown that here, also, pressure necrosis is not uncommon. This can be avoided almost entirely by the simple device of attaching a finger of a surgeon's rubber glove to the end of a rubber tube and making multiple minute perforations in the finger. The finger alone is allowed to come in contact with the wound surface and produces no tissue irritation or pressure necrosis. The use of this simple device also permits the treatment to be carried out in the immediate vicinity of large, exposed bloodvessels. The glove finger also seems to have very slight tendency to have its perforations become blocked by secretion. The method has given almost perfect results in a large number of patients in the author's hands.

Nerve Injuries.—H. S. Souttar (*British Medical Journal*, December 22, 1917) points out that in the vast majority of cases the nerve injury is primary and therefore it is possible to make an early diagnosis of its presence and probable extent and to institute suitable treatment at once. The several diagnostic points are outlined and made as simple as possible, so that every one can employ them in all suspected cases in order to avoid delay in treatment. The nerve injury outweighs all others from the point of view of ultimate utility of an extremity, and the treatment of the other injuries should be so conducted as to interfere to the least possible extent with that of the nerve injury. Whatever the nature of the injury the treatment should be arranged so that the formation of contractures will be avoided and the paralyzed muscles will not be stretched. The dressings should be arranged so as to permit the maximum of access to the wounded part, so that daily massage can be carried out to maintain the nutrition and suppleness of the skin and muscles and the mobility of the joints. Physical treatment aimed at the restoration of nerve function should be started as soon as possible and should include the daily employment of the following measures, each contributing its share in the recovery: massage; active and passive exercises, including the methods of Zander modified to suit the special conditions; hot whirlpool baths; and electrical stimulation by the galvanic and sinusoidal currents. Operative treatment may be undertaken either at the time of first seeing the wounded part, when immediate nerve suture can often be performed with success. Otherwise no operation should be undertaken until all risk of septic infection has passed, that is, not before six weeks have elapsed since the sound healing of the wound. Then end to end nerve suture, end to end suture after alteration of the course of the nerve, nerve flap lengthening, or the use of an autogenous nerve graft can be undertaken with excellent hope of success in the majority of cases. In these operations the greatest care must be exercised to avoid all handling of the nerve ends except by the bulbous fibrous parts which are to be subsequently amputated.

Nephritis.—Martin Fischer (*Pennsylvania Medical Journal*, January, 1918) has formulated the following rule: Avoid, remove, and combat every condition that favors the abnormal production or accumulation of acids and substances acting like acids in the kidney. In threatened or established cases of nephritis give alkali, salts, and water. The alkali is given to neutralize the acid present in abnormal amount in the kidney, the salts are indicated because the various changes induced in the kidney colloids by acids are counteracted by adding to such acid any salt, even a neutral salt, and the water is given in order to have more of it present than is necessary to saturate all the body colloids, as otherwise there is no free water left for the secretion of urine. An active administration of sugar either by rectum or intravenously is advantageous. The reasons for this are that carbohydrate starvation is a very common cause of acidosis and that sugar is very efficient in reducing hydration.

Surgical Treatment of Varicose Veins of the Lower Extremity.—E. R. Secord (*Canada Lancet*, October, 1917) enumerates the usual methods as, 1, the Trendelenburg operation of excision of the upper end of the saphenous veins; 2, the Mayo stripping operation; 3, the Schede garter or circumcision operation. Finding that the results in any one of these methods gave not entirely satisfactory results, Secord has combined several methods with great success, as follows: The Trendelenburg operation is done in all cases; the main venous channels are removed in one piece from the uppermost point of dilatation down to the internal malleolus; every communicating vein is ligated as it perforates the deep fascia, and finally the veins that have been left are obstructed by a modified Schede incision about two and a half inches below the knee, excepting only one inch on either side of the longitudinal incision. The only real objection is the time required, which is about an hour and a half. Healing of the long wound is insured by the "no hand contact" method, even the gloves and instruments being prevented from touching the skin by stitching towels to the skin edge. The dressings are not disturbed until the tenth day, when the sutures are removed, the leg firmly bandaged, and the patient allowed up. Gradual use of the leg is permitted and discharge of the patient occurs in three weeks from the date of operation.

Wounds of the Knee Joint.—Sir Berkeley Moynihan (*Canada Lancet*, January, 1918) sums up the treatment of knee injuries as follows: The leg should be immovably splinted at once, x ray examination should be made in all cases, and the limb prepared for operation. The essential features in all operations are excision of the wounds and of the track of the projectile, free exposure of the joint, removal of all foreign bodies, and closure of the wounds in layers with catgut. Drainage tubes are never put in the joint cavity; in severe infection the wounds must be reopened, the synovial membrane stitched to the skin, and the Carrel-Dakin or other method of progressive sterilization practised. In cases of severe comminution of the articular ends with much loss of substance, a resection of the joint is performed, and in cases with heavy infection the method of Fullerton should be practised, which includes wide temporary separation of the ends of the bones. In cases with very extensive damage, especially with infection, amputation should be done.

Treatment of Movable Bodies in the Knee by Arthrotomy and Immediate Locomotion.—Willems and De Caestecker (*Presse médicale*, December 17, 1917), in five cases of movable bodies in the knee joint, removed these bodies by operation, then allowed the patient immediately to walk about. Such a procedure had already been advocated before the war by Willems in joints evacuated by puncture, and since applied also in a series of men with missiles lodged in the joint or even with intra-articular fractures of the knee, excellent results following. In the presence of movable bodies the authors make an internal or external incision in the joint, according to the situation of the movable body. The latter having been removed, the incision is

closed in three layers, synovial membrane, capsule, and skin. Only a small, loose dressing is applied, to obviate restriction of joint movements. As soon as the patient wakens from the anesthesia, active mobilization is commenced, the patient being required to raise the extended limb and perform a series of flexor and extensor movements, in as wide a range as possible. The same exercise is continued almost without interruption. Next day, and sometimes even on the same day, the movements in beds are replaced by walking without any support. The patient is at first fearsome and hesitates to flex the knee in walking, but soon becomes convinced that he can walk with but little pain, bears more weight on the limb, and gradually flexes it. In a few days, normal locomotion is restored. The quality of the recovery is also much improved, mobility of the joint returning completely and remaining so. The muscles throughout show no trace of atrophy, and the functional result is so good that several of the cases reported have returned to service in the trenches.

Ductless Gland Therapy in Gynecology and Obstetrics.—Samuel Wyllis Bandler (*International Journal of Surgery*, January, 1918) regards hyposecretion of the thyroid as the condition most readily overcome by the administration of the proper gland extract. For avoiding or diminishing flashes ovarian extract and corpus luteum are of great value. There are some cases, probably pluriglandular in origin, which are not benefited by this method of treatment. If the ovary is underactive and the primary condition rests there we get an excellent result by the administration of corpus luteum or, particularly, ovarian extract. Relative amenorrhea or late development of menstruation in young girls is benefited by the administration of thyroid extract and pituitrin combined with ovarine or corpus luteum. Cases of diminished menstruation and sterility are best treated by the administration of ovarian extract, thyroid extract, and pituitrin, five minims three times weekly, by hypopituitary gland extract. They should also receive corpus luteum extract and pituitrin, five minims three times weekly, by hypodermic. In conditions marked by asthenia adrenalin hypodermically and especially the suprarenal extract by mouth, administered with the whole gland of the pituitary, for weeks and months, will often bring about good results. For uterine bleeding not due to the presence of a new growth in the uterus nor to overgrowth of the endometrium, mammary gland extract and thymus extract are excellent. Little can be expected of mammary gland extract given in large doses for fibroids of the uterus.

Antigenic Properties of Different Strains of Bacillus Typhosus.—Sanford B. Hooker (*Journal of Immunology*, December, 1916) demonstrated consistent antigenic differences among some strains of *Bacillus typhosus*. From the results of his work he advises using a balanced polyvalent typhoid vaccine for immunizing and therapeutic purposes. Experimental work does not justify the prevailing practice of using a single old strain for prophylactic immunization.

Mental War Cripples.—George H. Savage (*Practitioner*, January, 1918) is of the opinion that a very large number of soldiers and sailors will, after the war, be found more or less crippled, that is, unfit to perform their normal and accustomed duties, and that they will need special treatment and in some cases will have to learn fresh work. For such patients, physical or mental cripples, he believes that colonies in the country will be found to be the most beneficial. It will have to be considered whether such colonies should be special or general. His own opinion is that for epileptics the colony should be special, but that for other nerve disorders a union with other sufferers might be found useful, as drawing the patient away from his subjective state to one of more active objective sympathy.

Treatment of Epithelioma of the Lower Lip by Radium.—Russell H. Boggs (*Urologic and Cutaneous Review*, February, 1918) prefers to treat these conditions with radium rather than by surgical methods. The objection to the surgical removal is the frequent recurrence in the scar because the operation on the glands cannot be complete and the objection to radium, supplemented by the Röntgen rays, is that it may be necessary to produce a marked reaction locally. The advantage of radiation is the removal in most cases of diseased cells without producing deformity and contraction and healing with very little scar formation.

Comparative Efficiency of Local Anesthetics.

Torald Sollmann (*Journal A. M. A.*, January 26, 1918) presents a synopsis of a series of investigations to determine the comparative efficiency of a number of local anesthetics, both with reference to their anesthetic values when used on mucous surfaces and when used intracutaneously. The results show that for intracutaneous use cocaine, novocaine, tropacocaine, and alpin hydrochlorides were of equal efficiency; betacaine hydrochloride was half as efficient; quinine urea hydrochloride one fourth; apothetin and antipyrin one eighth as efficient. For surface anesthesia of mucous membranes cocaine and holocaine were the most effective; betacaine half as effective; tropacocaine, alpin, and quinine urea one fourth; apothetin one eighth; novocaine one sixteenth; and antipyrin less than one twentieth as efficient as cocaine. In the case of surface anesthesia the addition of an equal volume of a like solution of sodium bicarbonate made the resulting solution as effective as the original which was twice the strength. This seemed to be due to an increase in the power of penetration of the anesthetic brought about by the sodium bicarbonate. On the other hand the addition of epinephrine was proved useless and probably rather decreased the efficiency of the anesthetic. For intracutaneous purposes the addition of the bicarbonate did not increase the anesthetic action, but the use of epinephrine, by delaying the absorption of the drugs prolonged their action. Potassium chloride or sulphate in one per cent. solution had some anesthetic property, but not sufficient to make it of any material value alone. It might well be used, however, to replace the sodium chloride in making up the isotonic solution.

Thrombosis.—H. Fairley Marris (*British Medical Journal*, December 22, 1917) has treated seventeen cases of venous thrombosis involving one or both femorals or one of the iliac veins. Most of the cases occurred during infection with one of the enteric group of organisms. The cases were treated alternately as they were received by one of the two methods to be described. Either the patient was given large oral doses of citric acid and a milk free diet, or one or more intravenous injections of 0.5 per cent. sterile sodium citrate in normal salt solution were given. The latter method of treatment did not include any modification in the diet. In those treated by the intravenous method the subsequent period of fever was shorter by an average of four days and the onset of convalescence was on the average ten days earlier than in the cases treated orally. Of the seven intravenous cases, five were evacuated walking and two as sitting, while of the ten oral cases only five could walk when evacuated, three were able to sit up, and two had to be evacuated on stretchers.

Liberation of the Soleus in Wounds of the Calf of the Leg.—R. Grégoire and F. Marsan (*Paris médical*, December 22, 1917) refer to the rather serious nature of wounds of the calf, accounted for by the difficulty of securing proper drainage and removing missiles, as well as of ligating the posterior tibial artery in the midst of tissues rendered tense by infection. The muscles, bound down by their aponeuroses, herniate, owing to their swollen condition, as soon as these aponeuroses are incised. For the extraction of deep missiles in this part, for securing drainage in swollen, infected calves with or without bony involvement, and for ligation of the posterior tibial and peroneal vessels, the authors recommend separation of the soleus muscle from the muscles lying above and beneath it. With the patient on his back and the limb partially flexed and in abduction and external rotation, an incision fifteen to twenty centimetres long is made along the inner border of the tibia, over the inner margin of the gastrocnemius. The aponeurosis is then opened, and the gastrocnemius separated from the soleus with the grooved director. The attachments of the soleus along the inner border of the tibia are then cut, hugging the bone closely, and this muscle separated from the deep layer beneath it. In this procedure a retractor is of great help. Where the wound is on the outer aspect of the limb, the incision and liberation may be effected from the outer side, the soleus being detached from the fibula. After these procedures, collection of pus in the deeper tissues of the calf can no longer take place. In gas phlegmons, they facilitate discovery of the gaseous infiltration in the various muscles and exposure of the fibres of the latter. Where a compound fracture exists, the focus can be extensively opened up, easily cleansed, freed of free bone splinters, and drained at the most dependent point. It is best not to insert drainage tubes, however, the removal of discharges being satisfactorily carried out by a flat compress slipped between the different tissue layers. The posterior tibial artery was easily ligated high up, almost at its point of origin, by this method.

Miscellany from Home and Foreign Journals

The Atropine Test in the Diagnosis of Typhoid Fever.—E. H. Mason (*Archives of Internal Medicine*, January, 1918) carried out the test originally suggested by Marris in 109 patients, comprising sixty-three with typhoid or paratyphoid B infections and forty-six nontyphoid cases. In performing the test the pulse rate is taken on a fast-acting stomach for ten successive minutes. If it remains practically constant, this is accepted as the average mean rate. Atropine sulphate, 1/30 grain, is then injected hypodermically into the upper arm. Twenty minutes later, the patient having meanwhile remained quiet in bed, the pulse counting is resumed and continued until the maximum rate a minute has been reached and it has definitely started to fall to a lower level. The difference between this high level and the mean rate before the injection is taken as the "release." In most normal persons the rate increases from twenty to forty beats a minute after the atropine. In early adult life the increase is more marked; after fifty years, less. An increase of only ten beats or less a minute is considered by Marris very suggestive of a typhoid or paratyphoid infection. Among Mason's patients, eleven of the sixty-three typhoid or paratyphoid cases gave a negative, that is, a release of ten or less; this may be partly accounted for in that six of the eleven were given only one test, while three were extremely toxic and restless at the time of the test, this undoubtedly increasing the release. The atropine test was found to become positive at about the tenth and to disappear at about the thirty-first day of the disease. In the nontyphoid group three cases gave a positive reaction. The author deems the test of great value in the diagnosis of fevers of the enteric group. In many cases it precedes the positive Widal reaction. The use of atropine in the manner described is suggested as a means of diagnosing the syndrome termed vagotonia.

Prognosis in Cardiac Affections.—Robert H. Babcock (*Journal A. M. A.*, February 9, 1918) discusses this subject from the point of view of the relation of the discovery of murmurs and arrhythmias to the outlook for life. He says that a case must not be judged on the detection of a murmur alone, whether diastolic or systolic, because a really intelligent opinion is possible only from a study of the case in all of its aspects. The question of whether a murmur is organic or so called functional can arise only in the case of systolic murmurs, because those occurring during cardiac diastole or in presystole are always due to some structural defect. Even where such definitely structural murmurs are present, prognosis depends largely on the degree of the lesion, the integrity of the myocardium, and the subjective symptoms. It may be stated as a general proposition that mitral or aortic stenosis is less favorable in outlook than similar insufficiencies because the stenotic lesions are usually progressive. Mitral systolic murmurs should be divided into those which are due to endocardial lesions and those of myocardial origin. The latter are far more common after than before the middle period of

life and are not usually of very good prognosis because their presence is an indication of lack of soundness of the musculature. The prognosis even in these must consider the age of the patient, the evidences of cardiac muscular impairment, the presence or absence of focal infections, angina, and other factors indicating the precise degree of myocardial damage. In true endocarditic mitral systolic murmurs one must consider the factors likely to cause further injury such as a marked tendency to repeated rheumatic attacks, infected tonsils, etc. If there is little or no dilatation or hypertrophy and the patient can withstand severe exercise without discomfort, the prognosis of a mitral leak is good in the absence of further involvement. Such principles as these must guide one in prognosis in the presence of murmurs. Of the arrhythmias auricular fibrillation and persistent ventricular extrasystoles in the aged or associated with valvular lesions are almost the only ones of serious prognostic import.

Bone and Joint Lesions in Yaws.—H. G. Maul (*Philippine Journal of Science*, September, 1917), among 100 cases with a positive diagnosis of yaws, found twenty suffering from bone and joint lesions. In x ray studies these lesions generally appeared as irregularly oval or elliptical rarefied areas, with the long axis parallel to that of the affected bone. These areas, at times two or three centimetres in length, showed moderately well defined borders and varied in translucency from a slight unnatural transparency to one simulating a perforation. Most of the lesions appeared to originate in the interior of the bone, but a number were seen as small surface excavations. In the latter, the periosteum was usually destroyed; occasionally the cortex showed thickening and the periosteum was separated from the bone. About two per cent. of such cases show a nodular type of lesion, with swelling over the bone and a localized thickening of the cortex, which sooner or later undergoes central rarefaction. In the chronic lesions the bone, as a whole, becomes deformed and its growth is interfered with, especially in the presence of epiphyseal involvement. Within the joints, destruction is most often seen in the portions of the articular surfaces most exposed to trauma, or oval or irregular excavations. Apart from the nodular cases, the x ray picture differs from that of bone syphilis in the absence of periosteal proliferation and cortical thickening. In the nodular cases the thickening does not tend to extend along the bone. The differential diagnosis of the bone lesion of yaws from tuberculous or septic central bone abscess gumma, hydatid cyst, benign cyst, fibrous osteitis, enchondroma, endothelioma, secondary carcinoma, myeloma, and sarcoma is made through the x rays, the history, the physical signs of yaws, and the evidences of disease or tumor in other parts of the body. The Castellani treatment causes gradual disappearance of the yaws bone and joint lesions. Salvarsan is followed by rapid bone regeneration, which is complete if the destruction has not been too great.

Bruck Precipitation Test for Syphilis.—Arthur William Sullivan (*Medical Insurance and Health Conservation*, January, 1918) describes the test as follows: To 0.5 c. c. of clear serum in a large test tube two c. c. of distilled water are added and the tube shaken. Then 0.3 c. c. of acidum nitricum purum of the German Pharmacopœia are added. The tube is again shaken and allowed to stand at room temperature for ten minutes. To the white precipitate thus formed, sixteen c. c. of distilled water are added and the tube, capped by the finger, is carefully inverted three times, the formation of froth being avoided. The tube is allowed to stand again for ten minutes and then inverted three times in the same manner. After the tube has been allowed to stand for twelve hours at room temperature the reaction may be read. The tubes showing a slight precipitate should be read as doubtful or negative, those showing more than a slight opalescence as positive, and those remaining clear as negative. The author has employed this test in ninety-seven cases of syphilis and in seventy-four nonsyphilitic cases. As a result of his observations he concludes that the test is not of clinical value as it is remarkably weak in early untreated cases, giving negative reactions so often as to make it useless for diagnosis in this class of cases. In nonsyphilitics it gave twenty-four per cent. of positive reactions.

Pregnancy and Pulmonary Tuberculosis.—Charles C. Norris and H. R. M. Landis (*Journal A. M. A.*, February 9, 1918) point out that the incidence of pregnancy and tuberculosis is frequent and it is not uncommon for tuberculosis to first manifest itself at or shortly after pregnancy or parturition. The literature of the influence of pregnancy on the course and prognosis of pulmonary tuberculosis is large, but the principal papers are reviewed and show that somewhere between fifty and ninety-five per cent. of tuberculous women grow worse as the result of pregnancy or parturition. From this review and a study of 103 cases of their own observation, the authors conclude that pulmonary tuberculosis has little or no influence on conception or the course of pregnancy, and that about twenty per cent. of mild, quiescent cases of pulmonary tuberculosis and seventy per cent. of more advanced cases show exacerbations of their tuberculosis during pregnancy or the puerperium. It is not yet possible to determine in advance what cases are going to withstand pregnancy well and what are not, but the occurrence of moderately extensive lesions, recent activity, secondary lesions and complications, laryngeal involvement, loss of weight, fever, hemorrhage, sweats, and inability to secure proper treatment are all of unfavorable omen. If there is evidence of activity of the tuberculosis, the uterus should be emptied before the fifth month, and by this from sixty-five to seventy per cent. of cases will be improved. Expectant treatment should be practised after the fifth month and labor should be made easy by early induction and the use of forceps. The general hygienic and dietetic measures for the treatment of pulmonary tuberculosis should be followed throughout the pregnancy and thereafter.

Vertigo.—Lewis Fisher (*Annals of Otolaryngology and Laryngology*, June, 1917) is of the opinion that vertigo does not exist unless there is some disturbance of the vestibular apparatus. He states that it cannot be too strongly emphasized that any disturbance of equilibrium can result only from direct affection of the vestibular apparatus which interferes with the perfect balance between the special static organs on each side. Vertigo may be due to some simple irritation of the vestibular tracts, to some affection of the internal ear itself, or to some lesion situated within the brain. To determine the real cause necessitates a careful investigation of the ear and its associated pathways.

Contribution to the Study of War Nephritis.

J. Shaw Dunn and J. W. McNee (*British Medical Journal*, December 8, 1917) have studied this form of acute nephritis since the early part of 1916 and here bring out some points of special interest. In the etiology of the disease they find that season, weather conditions, and locality seem to play no part, though in some military units the disease seems to be continuously more prevalent than in others. The relative infrequency of the disease among officers and the apparently absolute immunity of the native Indian troops stand out unexplained. The most characteristic clinical features of the disease are the presence of edema, especially of the face and legs; pronounced dyspnea; pains in the head, limbs, and back; and frequent absence of fever; all combined with the occurrence of a very marked albuminuria with abundant urinary secretion of normal specific gravity, but containing hyaline casts and red cells. Pathologically the typical lesions are found in the kidneys and to a less extent in the lungs and brain. The most marked feature in the kidneys is the obstruction of the glomerular capillaries by abnormal cells, which lesion is more or less uniformly distributed throughout both organs. Lesions which are strikingly similar to those found in cases of "gassing" are present in the lungs of a considerable number of the cases of war nephritis. In a very few cases, also, the brain shows minute capillary hemorrhages. These findings, together with the clinical aspects of the disease and the absolute inability to cultivate any specific organism from the urine, blood or other tissues, suggest that the disease may be due to some readily diffusible poison of unknown origin, but which exerts its influence specially on the capillaries of the kidneys, lungs, and brain.

Hemophilic Arthropathy.—Guillermo Madero (*Revista de la Asociación Médica Argentina*, October, 1917, in reporting a case of this condition in a man twenty-five years of age, comments upon the rarity of hemophilia in adults. He gives two reasons for this rarity, namely, the tendency for hemophilic children to succumb before reaching maturity and the tendency for the blood in individuals who survive to acquire the proper power of coagulation. The following points aid in diagnosis: Patients are usually under fifteen years old and of the male sex; a history of traumatism; indolence and benign nature of lesion; presence of subcutaneous hematomata; absence of adenopathy; radiographic findings and the hemophilic family history.

Röntgenological Studies in the Healing of Gastric and Duodenal Ulcers.—Walter W. Hamburger (*American Journal of the Medical Sciences*, February, 1918) describes a method of röntgenological study of the healing of gastric and duodenal ulcers which he holds to be of value in the diagnosis, prognosis control of medical treatment, and selection for surgical treatment. It is also of value in studying the pathology of the healing process in these conditions. It is not of positive value in the differential diagnosis between ulcer and cancer, and in the use of the method the danger of mistaking normal peristalsis for penetrating ulcer and of overlooking the presence of a small ulcer because of incomplete or insufficient examination must be borne in mind.

Vaginal Discharge in Children.—I. C. Rubin (*Boston Medical and Surgical Journal*, January 31, 1918) says that to establish the diagnosis of gonorrheal vaginitis in children and infants the following facts must be evident: 1. There must be a purulent discharge from the vagina. 2. The intracellular Gram negative diplococcus of Neisser must be discovered in the pus cells. 3. This organism must further be grown on suitable culture mediums and properly identified as the gonococcus. 4. In case of doubt complement fixation tests and agglutination tests should be resorted to. In the absence of these tests we are not justified in considering any vaginal discharge in children as gonorrheal, nor are we justified in treating it as such. The smear examination, even by the Gram stain of secretion or discharge from the vagina, is unreliable and misleading, and hence valueless as a method of diagnosis.

Diagnosis and Bacteriology of Endocarditis Lenta.—R. Debré (*Presse médicale*, December 17, 1917) states that the diagnosis of this condition is rendered difficult because of the insidious onset, because the heart lesion is apt to be erroneously considered independent of the existing general disease and referred to a former rheumatic fever, and because the less characteristic general signs of the disease are those which stand out the most prominently, and careful examination is necessary to detect the more typical signs, such as splenic enlargement, skin disturbances, the heart signs, and the presence of the pathogenic germ in the blood stream. Particularly difficult is the differentiation of slow malignant endocarditis and a grave form of articular rheumatism. The chief differential features are as follows: Malignant rheumatism occurs especially in children; slow malignant endocarditis, in adults. In the latter the pericardium and pleura are hardly at all involved, while markedly affected in rheumatism. Nodular skin lesions, purpura, and Osler's phenomenon are constant in slow endocarditis, in which, furthermore, the anemia and loss of weight are much more pronounced, the fever more irregular, the course more protracted, splenomegaly constant, and renal involvement with hematuria much more frequent. Sodium salicylate fails and the appearance of embolism in the viscera is very characteristic of the endocarditis. The blood culture, negative in malignant rheumatism, when positive settles the question. Debré collects twenty mls of blood by vein puncture, and to increase the

chances of a positive result, divides fifteen mls between two flasks containing, respectively, 200 mls of two per cent. glucose bouillon and a like amount of "liquid T medium," the remaining five mls being divided between two Petri dishes, one containing glucose agar to be mixed with the blood, and the other some solid T medium. The T medium, formulated by Truche, Cramer, and Cotoni, consists of peptone, forty grams; salt, five grams, and glucose, two grams, in a litre of water. The solid medium is made by adding two per cent. of agar agar. Repeated tests should be made. The special pathogenic agent is always a streptococcus which is nonvirulent for laboratory animals and nonhemolytic, these being its only constant properties.

Surgical Significance of Abdominal Pain in Children.—Willis E. Hartshorn (*Medical Record*, January 19, 1918) writes that the most common source of abdominal pain in children is intestinal disturbance, due to indiscreet eating or constipation; appendicitis; peritonitis from pneumonia, surgical conditions elsewhere in the body, empyema, subphrenic abscess, tubercle bacillus, infectious diseases and typhoid perforation; or volvulus, intussusception, or pyelitis. Every case of acute pain with tenderness localized in the region of the appendix should be classed as appendicitis, especially if there is a high leucocyte count with an excess of polymorphs of eighty per cent. or over. Pyelitis should be thought of in a sick child with obscure symptoms and uranalysis establishes the diagnosis.

War Nephritis.—Thomas Oliver (*British Medical Journal*, December 8, 1917) discusses certain aspects of this baffling disease and points out that the etiology is as yet quite obscure. In a number of cases he has been able to demonstrate the presence of lead in the urine, and this, together with the peculiar pathological lesions of the disease, suggests that this metal must be considered as a possible cause in some cases at least. The source of the lead is uncertain, the canned food and drinking water supplies being found free from the metal, except for infinitesimal traces in the former. On the other hand it is to be borne in mind that many of the men who have been wounded still retain in their tissues fragments of leaden missiles and in a certain proportion of such cases lead has been found in the urine. In this connection, however, it is pointed out that the occurrence of lead in the urine of such men is not necessarily associated with any renal disturbance. The suggestion that the continued absorption and excretion of lead by the kidneys may, in part, be the underlying cause in some cases does not in any way exclude the existence of other factors in these and other cases.

Spinal Anesthesia.—Giovanni Cocci (*La Rivista medica*, November 17, 1917) from a wide experience with this method considers that it should be employed only in operative procedures of light or moderate gravity and of short duration. It should never be used in operations which in themselves are likely to produce shock, such as major laparotomies, or in patients who are already in a state of shock.

Proceedings of National and Local Societies

THE NEW YORK NEUROLOGICAL SOCIETY.

Regular Meeting, Held April 3, 1917.

The President, Dr. FREDERICK FLEISSY, in the Chair.

(Continued from page 432.)

Ataxic Type of Cerebral Birth Palsy.—Dr. J. RAMSAY HUNT, of New York, did not think the term "cerebrocerebellar" was a good one, as it was too inclusive and was applied to a group of cases which had already been described as the "atonic astatic type" (Förster.) At the present time three types of infantile cerebral palsy were recognized: a spastic type, an atonic type, and a rare cerebellar type. In addition, there were subdivisions characterized by choreiform movements, athetoid movements, tremiform movements, atactiform movements, epilepsy, and mental defect in various degrees and combination. Consequently, if any classification was made of this very large and bizarre group of infantile cerebral affections, one should adhere strictly to clinical subdivisions, at least for the present; and such a term as "cerebrocerebellar" did not tend to clarify the situation, as it would include a group of cases referable to the frontal lobe—Förster type—as well as the cerebellar type. Furthermore in two of Förster's cases of the atonic type, he had demonstrated the existence of a lobar sclerosis of the frontal lobes while the cerebellum was macroscopically normal in both the cases; and while in Doctor Clark's cases there were symptoms which suggested a cerebellar origin, it could not be denied that cerebellar symptoms also arose from frontal lobe lesions, which was another objection to the term "cerebrocerebellar."

Doctor Hunt desired to call attention to what he would call the ataxic type of cerebral birth palsy, which was in marked contrast to the spastic form and the atonic form, although it resembled in many ways the cerebellar type. Three of these cases had come under his observation. This was a type of cerebral birth palsy characterized by pure ataxia without paralysis or spasticity. There was a history of prolonged or difficult labor, instrumental delivery and injury during the birth, followed by retardation and abnormality in the development of motor coordination. Because of this there was difficulty in learning to sit up, walk, talk, and use the hands. All of these acts showed evidences of incoordination and ataxia, with a tendency toward gradual improvement. There was static and locomotor ataxia and an incoordination of the upper and lower extremities which persisted in the recumbent posture. There was a moderate degree of hypotonicity and the tendon reflexes were diminished and might be difficult to elicit. The superficial sensations were apparently normal and the special senses were not affected. The speech was dysarthric and participated in the ataxic disturbances. There was a moderate degree of retardation of mental development, but no gross intellectual defect and no epilepsy. The symptomatology was bilateral and fairly symmetrical, although the symptoms might

predominate on one side. The legs were more affected than the arms. There was a tendency to gradual improvement. The gross motor power was well preserved and there was no tendency to spasticity or exaggeration of the tendon or periosteal reflexes. The plantar reflex was of the physiological type. There was rather a tendency to hypotonicity and diminution of reflex action. There was no nystagmus. Slowing of the rhythmical movements—dysidiadokokinesis—was present. The clinical picture was characterized by motor incoordination which affected in greater or lesser degree the various voluntary movements.

This clinical picture Doctor Hunt ascribed to a meningeal hemorrhage limited to the parietal lobes i. e., in the sensory sphere of the cerebral cortex. He believed that during the birth there was thrombosis or rupture in those parietal veins of the cerebral cortex which coursed in the interparietal fissure and drained the blood from the parietal lobes. Such a vascular lesion would lie posteriorly to the motor area in the sensory field, and as a result there would be a disturbance—agenesis or dysgenesis—in the development of the cortical centres and commissural system by which muscle memories were received and transmitted to the motor area. It was a sensory equivalent of Little's disease, and was characterized by bilateral cortical ataxia. Little's disease was a cerebral diplegia; this was a cerebral *ataxia*.

Dr. I. ABRAHAMSON, of New York, said that he had had two cases similar to those of Doctor Clark, which he had sent to Grossman for reeducation by the Maloney method and improvement in the condition had been reported. He considered this method superior to that of Frenkel. What Doctor Hunt said was perfectly true and only three years ago the speaker had called attention to the difficulty, in these cases, of differentiating between lesions of the parietal lobes and of the cerebellum; between special orientation and tonus orientation. Some of Doctor Clark's cases showed tremors, festination, etc., pointing to midbrain disease. Many types could be recognized, depending upon the sites of involvement, and one ought not to speak of a cerebrocerebellar disease, the term being entirely too general.

Doctor CLARK, closing the discussion, said that he had used the term congenital cerebrocerebellar diplegia for two reasons: 1. The association palsy was either due to an intrauterine lesion, or one at birth, in which instance the word congenital covered both inborn defect as well as that of an injury at birth. 2. The cerebrum was probably always affected to some degree, as shown in the fits, the mental defect, and the frequent association of injury to the pyramidal tracts, while the type of ataxia present was unmistakably a cerebellar one. As was to be expected in so widespread a lesion, embracing both large structures of the cranium, there were many basal ganglia and midbrain symptoms in the syndrome, such as tremors, dysarthria, nystagmus, and often difficulty in swallowing. It was better to make the syndrome large and all embracing, for the

time being, until there was sufficient clinical material and more was known definitely about the functions of the cerebellar and midbrain structures; then one might speak of subtypes and specify exactly the structures injured in the different subdivisions of the syndrome.

The really important point was the detailed general and specific plan of training treatment which had been found so practical and useful in dealing with such children. Not less important was the necessity of extending some such similar training treatment to many other cerebellar disorders, as Doctor Dana had also urged. Finally, this disorder was by no means so rare as some might think. We should be on the lookout for cerebellar involvement in all irregular types of cerebral palsies in children.

Some New Fields in Neurology and Psychiatry.
—Dr. THOMAS W. SALMON, of New York, said that chief among the many causes of the great interest in social problems was the shining example set by the achievements of preventive medicine. The new determination to understand social problems demanded of all branches of science, just as preventive medicine requisitioned aid from many sciences, assistance in pointing out means of applying existing knowledge. Psychiatry alone had much to offer toward the clearer understanding of social problems and toward the successful accomplishment of work for social betterment. Psychiatry contributed today to many interests which lay far outside the domain ascribed to that science only a few years ago. William McDougall, in his *Social Psychology*, urged psychologists no longer to be content with the sterile and narrow conception of their science as the science of consciousness, but to assert its claim to be the positive science of mind in all its aspects, or the positive science of conduct or behavior. This was true more particularly of psychiatry.

There were many specific practical tasks in social hygiene to which the resources of psychiatry were being successfully applied. In addition, it had a most important part to play in the great movements for social betterment now being undertaken with high hopes and with wide popular interest and support. In some of these movements—mental hygiene, provision for the feeble-minded, eugenics, the control of inebriety, and the better management of abnormal children—the part of the psychiatrist was that of leadership, not only in research, but in the formulation and, to a certain extent, in the execution of policies. No other science provided so direct an approach to the problems waiting to be solved before these movements could succeed. In such problems as the treatment of criminals and the prevention of crime, prostitution, and dependency, the part of the psychiatrist was to lead in research and to contribute information and guidance whenever it appeared that mental factors exercised important influences. It was above all things essential that the psychiatrist should not have the phases of these problems, upon which he was to work, arbitrarily assigned to him by others. It was necessary for him to obtain a view of the whole problem and to make for himself the decision as to which factors could best be understood as a result of psychiatric study, or could best be managed by the methods of dealing with

conduct disorders which psychiatry had developed during long experience with mental disease and other abnormal states.

These social tasks could not be evaded by psychiatry. Indeed, there seemed to be no tendency on the part of psychiatry to evade them; but willingness to aid was not enough. Men must be available, men with sound scientific training, energy, tact, vision, idealism, courage, and resourcefulness. The task of such men was to extend the frontiers of their science. There were now too few workers to meet the demand. The same was true a few years ago in public health work, but public health courses were now being formed in the medical schools and there was now a steady flow of young men being trained for useful work in this field. The same must be done to secure men for the social work of psychiatry.

Dr. EDWARD D. FISHER, of New York, declared that the opinions expressed in Doctor Salmon's paper tallied with his own experience of twenty-five years. In his early days, the principal point often brought up for consideration was the necessity for advance in the understanding by the public and medical profession of mental disease. This had begun before, but the realization of the necessity had culminated in the last twenty-five years, of the proper relationship between ordinary disease and mental disease. Physicians relegated to the care of the insane were often observers without any fundamental knowledge of organic disease and the patients were treated symptomatically. The great advances made in the study of diseases having a bearing on the causation of insanity had had their effect. The treatment of syphilis, the requirements made of physicians in hospitals to study pathology and bacteriology, to acquire some intelligent knowledge of the causation of disease, had done much to place psychiatry on a different basis than previously. The public had been taught to look upon insanity as a disease, capable of improvement, capable of cure and again sometimes incurable, just as some diseases of other organs were incurable or the reverse. This knowledge of insanity by the public and by the courts was being manifested by bringing these cases before an experienced psychiatrist and trying to differentiate the criminal from the insane.

Dr. I. STRAUSS, of New York, said that he believed that the association of psychiatry with criminality was a step in the right direction, but he did not believe that segregation or the study and investigation of criminality was a solution of the problem of insanity. There was something deeper in the present social system that required investigation. A study of poverty might show it to have something to do with the development of mental disease in the so called criminal class. It was well to educate the people to believe that insanity was a disease, but it was more important to teach the people that environment in childhood, starvation, and unhealthy surroundings, psychically as well as physically, had much to do with the development of abnormal states, and prevention of that kind was more important than segregation of the adult abnormal.

Professor WOODWORTH, of the Department of

Psychology, Columbia University, said that the part of Doctor Salmon's paper he might comment on was that referring to education, in urging psychiatrists to take an interest in the early development of children and youths. Education should be controlled by those who understood the general principles of education as well as the possibility of the development of neurological conditions. It was necessary to make a special study of children and young people, going outside of clinical experience to get at normal conditions in contrast with the early stages of functional diseases. What was needed was not so much retrospective study of children from the standpoint of the adult who had become neurotic, but psychological study of the child as he developed. There should be first hand observation of children from a practical and psychological point of view.

Dr. L. CASAMAJOR, of New York, closing the discussion for Doctor Salmon, said that he did not feel competent to express Doctor Salmon's views on the subject and could put forward only his own personal ideas and the thoughts which the paper had aroused in him. One point in the discussion called for some remark and that was the reference to the "criminal class," and to the "criminal class" developing psychoses. One ideal of society which had worked a great injustice in life was that all men were born equal; society knew that all men were not born equal for it recognized that men differed in respect to susceptibility to all diseases, but it seemed to have completely neglected the possibility that there might be mental differences and that all individuals were not born mentally equal. There was no such thing as a criminal class any more than there was such a thing as a lawyer class, a physician class, or a stenographer class. Crime was a matter purely of the law and so varied in different countries and different times. Business methods which were perfectly respectable ten years ago were now criminal, but that did not place those who indulged in them in a criminal class; probably everyone would belong to the criminal class if this were the case.

The problem of the criminal was one of individual anomalies of character and conduct, and it was the psychiatrist's work to study the causation of these anomalies. In the criminal one beheld an individual who, from peculiarities of his makeup, or disease of his mind, found himself at variance with the welfare of society and became an antisocial being. He was antisocial because he was defective or because he was sick, and his crime was but a symptom of his condition. It was not a question of the so called criminal class becoming insane, but rather one of an individual with a mental defect or a mental disease becoming antisocial to the extent of conflicting with the law—and so a criminal.

Regular Meeting Held May 1, 1917.

The President, Dr. FREDERICK TIMMEY, in the Chair.

A Case of Syringomyelia or Leprous Neuritis.

Dr. Hyman Climenko, of New York, presented this case for differential diagnosis between syringomyelia and leprous neuritis. The patient was a man fifty-eight years of age, born in this country of American parentage. A brother died of tuberculosis. He was rather illiterate, having been back-

ward in school life and with a poor memory. His posture was never erect. The present illness had its inception thirty-three years ago in some form of infection of the left arm with a secondary infection extending to the right arm. The deformity of the right hand consisted of a flexure at all the interphalangeal joints; the left might be called a paw hand and there were marked trophic changes of fingernails on the left. There was a scaly appearance of the skin of both hands. This case, that later will be reported in full, showed symptoms that might easily be attributed to leprous neuritis as well as symptoms that would lead to a diagnosis of syringomyelia, which was probably the true one in the opinion of Doctor Climenko.

Dr. EDWARD D. FISHER, of New York, said that he had now a very interesting case of syringomyelia under observation, but it was not the typical class of which this case of Doctor Climenko's was a type. He wished to ask if there was any deviation of the spine.

Dr. WALTER TIMME, of New York, said that some years ago he had the good fortune to be allowed to examine a number of cases of leprosy in Bergen, Norway, at the leper hospital, and this case of Doctor Climenko's impressed him as being in some respects similar to some of the cases there. The atrophic condition of the skin, the condition of the extremities, and the few scars on the whole resembled types that were undoubtedly leprosy. This case lacked the pathognomonic scars on the fingers which were rarely absent in true cases. On the other hand, leprous neuritis was not accompanied with loss of reflexes as a rule. It was difficult to recognize some of these cases without the presence of the germ being demonstrated, so that the diagnosis was still open. The speaker thought that treatment with oil of chomulgra might tend to clear up some of the symptoms, in the event that it was a case of true leprosy.

Dr. WILLIAM M. LESZYNSKY asked Doctor Timme if it was likely that a man would have such a condition of the hands for thirty-three years and not have suffered some progression of the disease if it were due to a leprous neuritis. He favored the diagnosis of syringomyelia.

Doctor TIMME replied that children the disease starting at the age of eight or nine might remain in the same condition until the patient was fifty or sixty years of age. The cases usually began with pain in the extremities, but this one did not. He had seen cases in which the disease had remained quiescent for decades.

Dr. S. P. GOODHART said that when he was in Cuba, he visited the leper hospital in Havana and saw many cases, resembling Doctor Climenko's that began with symptoms indicative of neuritis. The very extensive trophic changes, together with the history of onset, very strongly suggested those seen in Havana. If this were a true syringomyelia, there ought by this time to be some obtrusive changes on the motor side; however, the type of sensory dissociation spoke for this diagnosis which he was inclined to believe was the true one.

Doctor CLIMENKO, closing the discussion, replied that the spine was deviated. There was also marked myokymia and the Wassermann reaction.

both fluid and serum, was negative. When first studying the case, it seemed that the diagnosis would prove to be syringomyelia; the peripheral nerve condition as well as the skin, however, might speak for leprous neuritis. The patient had bulbar symptoms, difficulty in swallowing, and nystagmus—all characteristic in the differential diagnosis between this condition and leprous neuritis. The progress was that of syringomyelia and there were other points speaking for this diagnosis. He had hoped that a name for the peculiar deformity this patient presented might be suggested.

Cerebral Edema in Scarlet Fever.—Dr. CHARLES T. SHARPE, of New York, described this condition which he had observed in several cases, where it masked the ordinary clinical picture of the disease so that there was some doubt as to the diagnosis. In scarlet fever the rash might be atypical and the mental condition marked and grave doubt might arise unless the variation in type were recognized. In addition to scarlet fever, edema of the brain sometimes occurred during the course of measles and diphtheria, as well as poliomyelitis, the recent epidemic having offered splendid advantages for the study of the latter. The primary involvement might be that of the central nervous system. The mental symptoms might predominate from the beginning, or they might not develop for twenty-four to forty-eight hours after the onset and they sometimes persisted for weeks after convalescence from the infectious disease.

There was an interrelationship between the cerebrospinal pressure and that of the cutaneous circulation. This relationship was one of inverse variation. In the infectious diseases, both during the early and late periods of the illness, marked cerebral symptoms were frequently noticeable, as evidenced by stupor, low, muttering delirium, and slight retraction, possibly edema of the brain, relieved by a profuse cutaneous eruption, the outbreak of which was a favorable prognostic omen.

In the early stages the evidence of edema was to be found in the stupor, retraction of the head, the cephalic cry, the upward retraction of the eyes, muscular twitchings, *tâche cérébrale*, delirium out of all proportion to the temperature, marked Macewen's sign, increased reflexes, and in some rare cases paralysis and a positive Kernig, Babinski, and Oppenheim. The correctness of the diagnosis is proven by lumbar puncture with release of spinal fluid under increased pressure and by the analysis of this fluid. In the later stages, the evidence was to be found in the melancholia and phobias in some cases, while in others there was hyperexcitability. The fact that the condition cleared up with spinal puncture and other appropriate treatment removed the probability that the condition was due to another underlying condition, especially when they subsequently regained and retained normal mentality and health. Other evidence of the edema was to be found in the varying degrees of retinitis and congestion and blurring the discs.

Edema of the skin, with infiltration of the tissues by leucocytes, was a feature of scarlet fever. If then, the rash "struck in," as the old expression had it, one might expect to find this edema in that por-

tion of the body that had an interrelationship, as to pressure, with the skin. One might therefore expect, from the clinical evidence, that the cerebrospinal axis would be the part to exhibit this edema; the speaker believed that this occurred.

Dr. LOUIS CASAMAJOR said that when he had had opportunity to see Doctor Sharpe's patients they had recovered, so that none of the delirious features came under his observation. However, there was evidence that these children had formerly suffered from cerebral edema and it was therefore fair to assume that the edema had been a part of the clinical picture. Moreover, the sections showed edema which was quite marked and infiltrations, especially in the lymph spaces of the brain, spoke for severe edema accompanying an infectious process. This delirious picture might not always follow edema, though Doctor Sharpe's point was well taken that there was such a clinical picture of a nervous system rash accompanied by infiltration.

Pathological Effects of Streptococci from Cases of Poliomyelitis and Other Sources.—Dr. CARROLL G. BULL, of New York, said that prior to the recent epidemic it was not believed that poliomyelitis was caused by any organism that could readily be detected in or cultivated from the body fluids or tissues of victims of this disease. It had been experimentally established that conditions similar in every respect to poliomyelitis in man could be brought about in monkeys. Furthermore, it had been shown that this condition could be passed from one monkey to another by inoculating these animals with brain emulsions or filtrates. Therefore, the infecting agent was termed a filterable virus.

The recent epidemic, however, stimulated investigation on many lines and new conceptions arose as to the etiology. A streptococcus organism was cultivated from various tissues of poliomyelitis patients; the throat, tonsils, and blood during life; the cerebrospinal fluid, the central nervous system lymph nodes at autopsies. Mathers said he had been able to cultivate an organism like the streptococcus from the brain and cord of fatal cases, and this organism when injected into rabbits brought about a condition clinically similar to poliomyelitis and caused pathological lesions in rabbits which were similar in every way to the pathology of poliomyelitis in man. Rosenow, Towne, and Wheeler cultivated the same organism which they said caused a condition resembling poliomyelitis in rabbits, guinea-pigs, dogs, cats, and monkeys. Further experiments of these workers showed transmutation from the streptococcus like organisms to small globoid bodies.

Since these results were not in harmony with the work of other experimenters, Doctor Bull and other pathologists at the Rockefeller Institute endeavored to verify them. Streptococci were collected from the tonsils of a number of cases of poliomyelitis and their effects on various animals studied. Streptococci were isolated from the tonsils in other conditions as controls, an endeavor being made to get streptococci from children who had been exposed to the disease during the epidemic.

(To be concluded.)

Book Reviews.

We publish full lists of books received, but we acknowledge an obligation to review them all. Nevertheless, as far as space permits, we review those in which we think our readers are likely to be interested.

Neurosyphilis. Modern Systematic Diagnosis and Treatment. Presented in One Hundred and Thirty-seven Case Histories. By E. E. SOUTHARD, M. D., Sc. D., Bullard Professor of Neuropathology, Harvard Medical School; Pathologist, Massachusetts Commission on Mental Diseases; Director, Psychopathic Department, Boston State Hospital; Vice-President, American Medico-Psychological Association; and H. C. SOLOMON, M. D., Instructor in Neuropathology and in Psychiatry, Harvard Medical School; Special Investigator in Brain Syphilis, Massachusetts Commission on Mental Diseases; Acting Chief-of-Staff, Psychopathic Department, Boston State Hospital. With an Introduction by James Jackson Putnam, M. D., Professor Emeritus of Diseases of the Nervous System, Harvard Medical School. By Vote of the Trustees of the Boston State Hospital, Monograph No. II of the Psychopathic Hospital, Boston, Massachusetts. Boston: W. M. Leonard, 1917. [2]. 1-400 pp. Price \$5.00.

Nervous syphilis, with its bewildering array of clinical pictures and disease syndromes which overlap, interpenetrate, and blend with others until the mind reels in regarding them, cannot be discussed fairly in the ordinary textbook manner. Any attempt to do so necessarily sacrifices accuracy to system. It is all very well to describe syphilitic cerebral meningitis, and syphilitic meningo-mycelitis, and a host of others as if they were clear cut syndromes—and sometimes they are—but in doing so the syphilitic patient recedes from view, and he, after all, is the important thing. He must be studied individually, especially when the central nervous system is invaded. This the present writers have done. They discuss 137 case histories, ranging from cases presenting almost a single symptom to neuropsychological museums. These cases are described not in a lifeless, categorical fashion, but so vividly that we see the problem presented, almost the patient himself; and not only the diagnostic and prognostic features are expounded, but other aspects often intensely important for the practitioner, but how often neglected! The social aspects of the disease are discussed: Shall the patient continue his work? Shall he marry? The psychic aspects are also gone into: How shall we handle his syphilophobia? Is there such a disease as syphilitic neurasthenia? The authors' attitude toward general paresis is an optimistic one; they call attention to the infinite number of conditions which may simulate this disorder and emphasize the slogan, "Push treatment!" The last hundred pages of the book are devoted to neurosyphilis and the war. The effect of gas, shell shock, and the stress of warfare on these patients is discussed, together with instances of such syndromes as tabes and paresis precipitated by war. Altogether this book is a valuable one. It presents a vast quantity of clinical material, admirably described in all its aspects and enhanced by excellent tables and illustrations.

State Board Examination. Questions and Answers of the United States and Canada. A Practical Work Giving Authentic Questions and Authoritative Answers in Full That Will Prove Helpful in Passing State Board Examinations. Reprinted from the *Medical Record*. Fifth edition. Altogether new matter. Every question answered in full. New York: William Wood & Co., 1917. Pp. 973. (Price \$2.50.)

This volume of over 900 pages is the fifth edition of the *Medical Record State Board Questions and Answers*. It contains questions and answers asked at the examinations of the various State boards; also of the licensing boards of Ontario and the Medical Council of Canada. The grouping of the entire set of questions, followed by the complete set of answers is an improvement on the method of having the answer immediately follow the question. The answers are concise and to the point and the book must of necessity be of great value to any one preparing

to pass a State board or any other examination or as a review of the more important facts of any particular branch of medicine.

Childs of Childhood. By H. ADDINGTON BRUCE. New York: Dodd, Mead & Co., 1917. Pp. viii-310.

This book is very practically and simply fitted to the purpose it has in view. It is besides so clearly and scientifically expressed that it must prove not only attractive and instructive to parents who are realizing their psychological responsibility toward their children's training, but it will stimulate and rouse them to the possibilities that lie within their own hands and to the points of attack upon children's difficulties and disturbances, which it is theirs to make. Attention is first called to the signs of mental enfeeblement, often remediable, which are too often overlooked. Particular problems and manifestations of the only child, the favorite child, such symptoms as night terrors, sleep walking, and those more common ones of selfishness, jealousy, and the like, all these are run down to their source in maladjustment through influence of environment and lack of proper guidance as well as through perhaps unsuspected emotional disturbance in childhood. The examination of these various symptomatic phenomena met with in childhood and lasting over into adult life and the suggestions for detection and treatment of them, as well as prevention of them, are all fundamental and interpretative. They are conceived in terms of adaptability toward life instilled and fostered in childhood or failure of this and the child's centering of interest upon himself. This interpretative attitude might be still more comprehensive in the conception of the unity of energy striving in each child life and find in this a still more complete method of approach both for training in the interpretation and correction of difficulties. The book, nevertheless, represents marked advance in this direction.

Births, Marriages, and Deaths.

Born.

SCAL.—In New York, N. Y., on Sunday, February 24th, to Dr. Joseph C. Scal, and Mrs. Scal, a son.

Died.

AYVAZIAN.—In New York, N. Y., on Friday, February 15th, Dr. Antranig Ayvazian, aged sixty-seven years.

BINGHAM.—In Madison, N. J., on Sunday, February 24th, Dr. Harry Varley Bingham, aged forty-two years.

BRAND.—In Camp Doniphan, Okla., on Monday, February 11th, First Lieutenant George J. Brand, M. R. C., Ambulance Company 137, aged thirty-four years.

COPELAND.—In Whitman, Mass., on Friday, February 8th, Dr. Horatio F. Copeland, aged seventy-six years.

CUTTS.—In Brookline, Mass., on Friday, February 22d, Dr. Harry Madison Cutts, aged sixty years.

ELLIOTT.—In Peekskill, N. Y., on Friday, March 1st, Dr. Arthur H. Elliott, of Flushing, N. Y.

FRISSELL.—In Wheeling, W. Va., on Tuesday, February 12th, Dr. Charles M. Frissell, aged fifty-eight years.

GALLISON.—In Franklin, Mass., on Wednesday, February 13th, Dr. Ambrose J. Gallison, aged sixty-two years.

GOUGH.—In Wausau, Wis., on Tuesday, February 12th, Dr. Charles R. Gough, aged thirty-one years.

HAGADORN.—In St. Cloud, Fla., on Monday, February 11th, Dr. A. D. Hagadorn, of Lansing, Mich., aged seventy-five years.

KING.—In Muscatine, Ia., on Thursday, February 14th, Dr. Elbridge H. King, aged seventy-four years.

LATHROP.—In Livingston Manor, N. Y., on Friday, February 15th, Dr. George H. Lathrop, aged sixty-eight years.

McMULLAN.—In Elizabeth City, N. C., on Wednesday, February 13th, Dr. Oscar G. McMullan, aged sixty-one years.

MORRIS.—In New York, N. Y., on Monday, February 25th, Dr. George F. Morris.

O'BRIEN.—In New York, N. Y., on Monday, February 18th, Dr. John A. O'Brien.

PRATT.—In Fort D. A. Russell, Wyo., on Tuesday, February 12th, Captain Frank S. Pratt, M. R. C., of Gardiner, Ore., aged fifty-four years.

SERJANIAN.—In Lawrence, Mass., on Thursday, February 7th, Dr. Tatios K. Serjanián, aged fifty-three years.

ZERRETT.—In Norfolk, Va., on Thursday, February 7th, Dr. Carroll G. Zerrett, aged fifty years.

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Original Communications

THE TREATMENT OF PNEUMONIA.

The Croupous Type.

By ROBERT FRANKLIN IVES, M. D., F. A. C. P.,
New York.

The busy practitioner, anxious to learn the truth in order to formulate successful plans of treatment, seeks earnestly through current literature and reads eagerly reports from laboratories and scientific institutes, such as the Rockefeller Institute and the Carnegie Laboratory, to obtain reliable suggestions to aid him in his battle with this "captain of the men of death"—pneumonia. For ages, the treatment resolved itself in empiricism, for although the gross and minute lesions were recognized pathologically by Laennec and Virchow and their contemporaries, the specific cause was not realized until the discovery by Fränkel of the *Diplococcus pneumoniae* disclosed the true microbic nature of the infection.

The pneumococcus is now recognized as the causative agent. Many and various have been the plans advocated for its cure, from bleeding to the use of vaccines and serums. Drugs with antitoxic or chemotherapeutical virtue have been eagerly sought. The establishment of the pneumococcus as the etiological factor of importance was a giant stride forward in this effort to find a specific remedy because treatment presupposes a correct diagnosis. It may be emphasized that the "early hours are the vital hours," often spelling success or failure at the very onset. Be alert to the significance of a chill, with fever, pain in the chest, etc., and act promptly. An accurate diagnosis includes knowledge of the type of the etiological agent present. To Rufus Cole, director of the Rockefeller Institute, are we indebted for the knowledge of the types of this coccus. He has shown that there are four great groups of the pneumococcus, which have been numbered I, II, III, and IV. These groups differ mainly in their immunological reaction, no cultural difference having been detected. About sixty per cent. of the cases seen are of types I and II; fifteen per cent. of Type III; and twenty-five per cent. of Type IV. The highest mortality is seen in Type III.

As one third of all cases are of Type I, and as the specific serum recommended is especially efficacious for this type, when used early and in large dose, it is evident that the type must be known promptly if the serum is to be efficient. It is most

important to note that for the other two thirds, serum treatment is of no avail. Therefore, other methods must be used. It may be advisable to review some of the methods advocated by internists of large ability, great acumen, and recognized standing, for all these methods have their good points. Taking into consideration the personal equation, success will in a great measure depend upon the practitioner's knowledge of these methods, and his personal watchfulness, resourcefulness, and determination.

1. *The Rufus Cole treatment with specific serum.*—The use of this serum for pneumonia presupposes that the pneumococcus has been isolated by laboratory methods and proved to be of the Type I organism. The sputum must be obtained from the lungs, rusty sputum, that with a blood tinge, to be preferred. This sputum must be sent promptly to the laboratory and findings must be proved within eight to ten hours. Practically, it may be said that this method is successful mainly in a well equipped hospital. Should the pneumococcus prove to be Type I and the use of the serum decided upon, it is wise to test the patient for protein sensitization to horse serum. This is done by injecting intracutaneously a very small amount —0.02 c. c.—of horse serum diluted in salt solution 1:10; making the amount 0.002 c. c. To desensitize, 0.5 to one c. c. of horse serum is injected subcutaneously.

The method of treatment is to inject the serum early in large doses of about ninety to 100 c. c. of serum intravenously, diluted with salt solution. This is repeated every eight hours until a definite effect has been obtained. The action of the serum is not bactericidal or antitoxic, it is believed, but renders the virulent pneumococcus susceptible to phagocytosis. Cole states that whereas before treatment of this type of pneumonia was undertaken twenty-five per cent. or more died, in the last 108 cases treated with the serum at the hospital of the Rockefeller Institute there were only eight deaths. Thus the dictum has gone out from this institute that the time is coming when no doctor will be justified in treating pneumonia without full knowledge of the type of pneumococci present.

It may be noted that the Department of Health of the City of New York has made provision for the examination of pneumonic sputum at its research laboratory at the foot of East Sixteenth street, Manhattan. Sputum received before 10

a. m. will be tested and a report of the pneumonic type returned to the practitioner within twelve hours. The serum for Type I can always be obtained from the Department of Health in bottles of 100 c. c. Inasmuch, however, as the serum treatment is not generally applicable, a review of other plans of recognized treatment is desirable.

2. *The optochin method.*—Next to the specific serum treatment, the optochin method is worthy of serious consideration. In the hope of finding a chemical specific for the pneumococcus J. Morgenroth and his pupils have reported favorable results with the use of a quinine derivative called ethyl hydrocuprein, or optochin. The chemical formula of the drug is derived as follows: $C_{10}H_{20}N_2OH$, cuprein; $C_{10}H_{20}N_2OH OCH_3$, quinine; $C_{10}H_{20}N_2OH O(CH_2CH_3)$, methyl hydrocuprein; $C_{10}H_{20}N_2OH OC_2H_5$, ethyl hydrocuprein. Morgenroth experimented extensively with this drug on mice infected with the pneumococcus. These experiments led to the belief that the drug would be beneficial in human infection.

Alan M. Chesney, of the Rockefeller Institute, has experimented extensively with this preparation and has formulated very favorable opinions as to its use. Its action, he proved, was to destroy the pneumococcus wherever found, both biologically outside the human body, and even in the alveolar spaces themselves. Its use should be guided by certain laws, and given in proportion to body weight. A stated amount equal to 0.024 gram to a kilogram of body weight seemed to keep within the toxic action of the drug. The first dose given early should be large, and smaller doses given at three hour intervals. It is given in capsules.

Personally, I have used the drug extensively and administered it in doses of 7.5 grains three times a day. While transient amblyopia has been noted, and should be kept in mind, this has not happened in my experience. This drug undoubtedly proves valuable in the treatment of croupous pneumonia. It has the endorsement of Rockefeller Institute.

3. *The Seibert method.*—The use of large doses of camphor as proposed by Dr. August Seibert, of New York, merits consideration. The most important therapeutic indication in croupous pneumonia is to prevent, or to modify, the effects of toxemia. Realizing the condition of bacteriemia existing, Seibert seeks to overwhelm the pneumococci in the blood stream, thus causing a subsidence of the vicious inflammation by lysis instead of by crisis. This he firmly believes can be accomplished by large doses of camphor, the action of which, theoretically, is said to be antimicrobial, there being evidence of the destruction of the pneumococci both in the blood stream and lung tissue. By the destruction of the causative germ, lysis results. This camphor method seems to be new and original with Seibert. As soon as possible after the chill, ten c. c. of camphor in oil, equal to thirty-six grains of pure camphor is administered hypodermically in the tissue along the outer side of the thigh and repeated every twelve hours, except in bilateral cases and in severe toxemia, when it should be repeated in eight hours. The site of the injection should be painted with iodine and the injection made very slowly, taking ten minutes, if possible, for the ten

c. c. The injection is practically painless, and if care is taken, produces no abscess.

Seibert's results, thirty-six cases with thirty-five recoveries, are most striking. He advises this treatment in all forms of croupous and irregular pneumonias with consolidation and toxemia. The method is used as the dominant treatment. Additional treatment directed toward the various symptoms and cardiac failure is always recommended. The earlier the camphor is used the quicker is the response. This method may also be considered as following the lines of chemotherapy. Seibert thinks that the camphor has a semispecific action upon the pneumococcus analogous to salvarsan over the spirochetes. Personally, I have had some experience with the remedy, and outside of the production of one abscess, saw no evil effects, and believe that it exerted a great influence for good. In three cases of great severity, with empyema complicating in two, and intense jaundice from hepatitis in the third, all recovered.

4. *The Solomon Solis-Cohen method with massive doses of quinine.*—This method, likewise, follows the theory of chemotherapy. Cohen advises, as soon as the diagnosis is verified, that the patient, if fairly strong, receive an intramuscular injection of from fifteen to twenty-five grains of the drug, quinine and urea hydrochloride, in a fifty per cent. solution of hot sterile water. Children, and aged and feeble subjects receive smaller doses. The injection is repeated with fifteen grains every three hours until the temperature falls and remains below 102° F. Associated with this plan, special attention is given to the blood pressure which is taken very carefully every three hours. To control the blood pressure, cocaine hydrochloride in 0.5 grain doses, or pituitrin, one mil, is injected hypodermically and repeated every three hours until the curve representing the systolic blood pressure in millimetres of Hg taken on the arm remains above the curve representing pulse frequency in beats a minute. This latter practice is founded on the observations of the late G. A. Gibson, of Edinburgh, concerning the prognostic significance of the relation between pulse frequency and pulse pressure thus charted. Though present opinion lays less stress upon the Gibson law than formerly, still the prognosis is more encouraging if the pressure is maintained.

No maximum or minimum limit has been fixed to the number of injections of quinine, cocaine, or pituitrin, which may be used in place of the cocaine, but Cohen does not think it wise to continue the three hourly injections beyond the first twenty-four hours. In cases where the desired effect, as indicated by Gibson's blood pressure relation, has not been reached in twenty-four hours, the interval is increased to six hours. When the desired effect is gained, the repetition depends upon its maintenance. In general, the object is to give as much quinine as is necessary and can be safely borne within the first twenty-four hours, and as little cocaine or pituitrin throughout the treatment as is possible. The quinine is stated to be antitoxic. This conclusion is further strengthened by the absence of cinchonism, notwithstanding the large quantity given and absorbed. Theoretically,

there is supposed to be a mutual neutralization of the quinine and the pneumonic poison.

Cohen states: "This plan is superior to any other proposed. The control and relative ease of the respiration is wonderful to behold. . . . The whole clinical picture is changed." Cohen uses as little as one injection or as many as fifteen injections. In an ordinary case, however, the number of injections will be five or six, and the number of cocaine or pituitrin injections three or four each. Experience proves that the effect of the quinine can be obtained if the drug is given in capsule form by mouth. At first twenty grains in four capsules of five grains each can be given, followed by a five grain capsule every four hours.

5. *Forchheimer's treatment of the vasomotor paralysis with caffeine sodium benzoate.*—While at the present time opinion differs on the vasomotor paralysis being the positive element in cardiac failure, the late Dr. F. Forchheimer insists that the toxic albuminoids developed in the course of pneumonia, whether from the pneumococci or from the intestinal tract, are the elements that paralyze the vasomotor centre in the medulla. Forchheimer states: "I do not hesitate to say that with a healthy heart, vasomotor paralysis is a common cause of pneumonic death in so far as the cardiovascular apparatus is concerned, and it goes without saying that this mode of death may occur irrespective of the health or disease of the heart." He holds that the effect is due to splanchnic paralysis. He recognizes the effect as follows: increased heart rate, fall in the blood pressure, associated with marked tympanitis, signs of collapse, pulse irregularity, cerebral anemia, delirium, restlessness, and death.

To meet this condition, he asserts that caffeine meets the indication better than any other drug because of its power to stimulate the vasomotor centres. It always sustains the blood pressure unless there is some organic lesion. He recommends the double salt of caffeine sodium benzoate in doses of three to five grains every four hours hypodermically. Personally, while not wholly satisfied that the vasomotor paralysis is the essential cause of heart failure, in preference to dilatation of the right heart, the present consensus favoring the latter, I do absolutely recommend the use of caffeine as advised as soon as indicated. It is a drug of inestimable value in pneumonia.

6. *The writer's advocated treatment.*—This embraces all the essentially good features of all the plans mentioned, each case being considered individually and the plan modified accordingly. Faith is placed in the use of serum in Type I, if it can be obtained; in optochin, or quinine and urea hydrochloride as outlined; in camphor when toxemia is very marked; and in caffeine sodium benzoate, and digitalis by mouth or hypodermically as sheet anchors, thiocol or cresote carbonate being used with associated bronchitis.

In detail the following points in the treatment are important: absolute rest in the recumbent position, in the proper temperature, according to age and condition; careful attention to the intestinal tract; very careful feeding, including milk, cereals, fruit juice, egg, and limitation of the protein ele-

ments; following the chill, for the first twenty-four, thirty-six or forty-eight hours, administration of the dosimetric thirty granule:

Aconitine hydrobromide,	gr. 1/800
Digitalin,	gr. 1/64
Strychnine arsenate,	gr. 1/128

This is given to the aged or asthenic patients. To the robust or sthenic type the defervescent compound granule may be given.

Aconitine hydrobromide,	gr. 1/800
Digitalin,	gr. 1/64
Veratrine hydrochloride,	gr. 1/128

These formulas for many years had the endorsement of the late Dr. Francis Delafield, of New York, and are now used by thousands of able practitioners throughout the country. They promptly reduce and control the circulatory disequilibrium. These remedies are used at first half hourly, and later at hourly intervals. For the toxemia, quinine, optochin, or camphor, as outlined, are given, the quinine intramuscularly, the camphor subcutaneously and the optochin by mouth. Digitalis, tincture or powder, is given early. Strychnine sulphate, 0.025 grain, may be used for the vasomotor effect. For severe pain, small doses of morphine sulphate subcutaneously. For sleep or for restlessness, heroinhydrochloride, 1/12 grain, *pro re nata*.

A word regarding digitalis, the sheet anchor in the protection of the heart in pneumonia. Alfred E. Cohn, at the Rockefeller Institute, recently proved that the drug positively acts beneficially in the fever state. Therefore, in pneumonia it is wise to begin the administration of digitalis early in the course of the disease, the purpose being not to produce immediate effects upon the heart, but to put the patient in such a condition that later, when the need arises, physiological digitalis effects may quickly be obtained by the use of moderate doses by the mouth, subcutaneously, or intramuscularly. To accomplish this Cohn's method is advocated. If the case is seen early, 0.5 gram of the drug is given by mouth on the first and also on the second day. It is given again, in the same amounts, on the fifth and sixth days. No more is given unless indications arise. Of course it is understood, that these are adult doses, and based on the Cary Eggleston's method of administration. If the patient is seen late in the disease, say on the third or fourth days, 1 gram is given in the first twenty-four hours, then wait one day, and on the two subsequent days, 0.5 gram on each, is given. Should fibrillation or flutter develop, or should the rate unexpectedly rise, the drug is freely used. Cole recommends the product digipuratum because of its accuracy of standardization. Personally, I am very partial to this product in liquid form for intramuscular use.

It is obvious that the diet is important. Nourishment must be given in simple form—milk, cereals, fruit juices, with milk sugar—at regular intervals of two hours throughout the day, in amounts of six to eight ounces taken through a tube with the patient recumbent. Orangeade sweetened with milk sugar is both grateful and nutritious. Avoid producing flatulence. It is wise to open the primæ via carefully at the onset, a favorite combination being:

Cocaine, . . . . .	. . . gr. 1/6
Protophyllin, . . . . .	. . . gr. 1/6
Bilcin, . . . . .	. . . gr. 1/8
Strychnine arsenate, . . . . .	. . . gr. 1/250

This may be given, one every half hour for six doses, followed with a gentle saline, if needed. Following this initial medication, the intestinal tract may be relieved daily, if necessary, by gentle enemas. A quiet bowel, provided it is not distended, is desirable. Watch carefully for abdominal distention, the result of a failing vasomotor system. It is an ominous sign. The time to treat it is at its beginning.

Pneumonia patients differ in their ability to tolerate low temperature, and a wise decision must be made in individual cases. Some apparently are sustained, while others are positively depressed by cold. Never expose a patient in the course of nursing while in the open. It is better to provide two rooms; one with a temperature of 65° F., to which the patient can be moved for the attentions demanded.

In my judgment a continued temperature of 65° F. with frequent changing of the air tends to the best results. Never cover the chest with kaolin pastes. Each patient should have a well fitted, slightly padded jacket, open at both sides, and held by tapes which can be released without disturbing the patient. A mustard sinapism or dry heat is often advisable. Cups are of value for pleuritic pain. When pain is severe and exhausting, the patient should be relieved by morphine sulphate in small doses subcutaneously. It does no harm in my judgment. The time to treat failing heart is undoubtedly before it happens. Solomon Solis-Cohen has aptly said: "The disappointment experienced by many practitioners in the use of remedial measures lauded by others is often owing to the neglect of the factor of timeliness." Always carefully examine the heart for its inherent virtues or faults. If murmurs are present, estimate their significance and prognostic import. Are there valvular lesions, aortic involvements, or cardiovascular impairments? These should be recorded early in the treatment. Look for mitral stenosis especially; detect the jerky action and the disproportion between cardiac effort and pulse result; note the feel of the artery with its slight excursion and the rapid beat. Anticipate its failure with the digitalis advocated. Watch for signs of impending dilatation of the right heart, i. e., rising respiration, increasing pulse rate, falling systolic pressure, the appearance of increasing small, moist râles over the bases. A lifesaving measure is to relieve that failing heart, not by whipping it unduly by large doses of strophanthin or digitalis, but by easing the circulation by the removal of twelve to fifteen ounces of blood. In other words, bleed when indicated. This ancient method of treatment still has virtue in the right heart failure of pneumonia. The bleeding is not to cure the pneumonia specifically, but to avert heart failure and consequent death by intrapulmonary drowning.

Alcohol has no place in the treatment of pneumonia except in cases in which as a result of its excessive use prior to the illness, delirium is threatened. Oxygen cannot restore a moribund

patient. Its use is only of value prior to this condition. It is wise to make regular tabulated entries of the blood pressure on a chart. Recall that the toxemia at the onset may cause a fall of ten or more points in the diastolic pressure. Thus a low systolic pressure and the abnormally low diastolic pressure may deceive the observer into a false security of a fair pulse pressure. Remember that a low systolic and a low diastolic tend to a poor prognosis. The systolic must be maintained and raised, if possible. Forewarned is forearmed. It is vital that the recumbent position be maintained from the onset to the termination of the critical period, and for a period of seven to ten days following. Complications must be recognized and met promptly and positively. As all acute infections cause a myocardial involvement to a greater or less degree, inducing degenerative changes, insist on a slow return to the upright position, and restrain the patient for weeks to permit restoration of the enfeebled function of tonicity. Indicated tonics should be administered. Resolution, if delayed, may be hastened by radiation and iodides.

The successful care of pneumonia demands a physician who is alert, accurate in diagnosis, thoughtful, resourceful, and determined, one who is ready to resort to positive measures, if needed, and who knows no relaxation till the patient has wholly recovered or the battle lost; one who can control the case with power, and sustain the patient, family, and friends through his vigorous and dominant personality. Success must be his motto.

962 OCEAN AVENUE, BROOKLYN.

OPERATIVE PROCEDURE FOR THE RELIEF OF CONTRACTED SOCKETS.

By FRANK ALLPORT, M. D.,
Chicago.

Operations for the relief of contracted sockets and extensive symblepharon have been marked with many disappointments. The ingenuity of surgeons has been taxed and many operations have been proposed. Most of these operations have been endorsed by their proposers with reports of successes. I do not for a moment doubt the truthfulness of these reports, and it is probably owing to my lack of understanding or surgical skill that most of these operations have, in my hands, resulted in failures.

For instance, I lately became quite enthusiastic about an operation proposed by Verhoeff, which seemed to me easy and logical. In this operation the orbital cavity is enlarged to its fullest capacity by removing all scar tissue and undermining the conjunctiva so that it will expand away from all uncovered areas. A Thiersch graft is then carefully laid upon a double sheet of Cargile membrane and accurately wrapped around a large glass ball that, if possible, expands the orbit to its fullest capacity. The ball, the membrane, and the graft are then carefully inserted into the socket. In five or six days the ball is removed, cleaned, and replaced in position. This should be repeated every two or

three days. Verhoeff says that at the end of two or three weeks the ball may be removed permanently and an artificial eye inserted. I performed this operation on several very bad cases where the eyeball had been removed and the socket contracted. I was delighted with the primary results. A large cavity was produced, beautifully lined with skin, but before long the socket contracted, in spite of the reinsertion of varying sizes of glass balls and varying sizes of artificial eyes, and eventually a condition worse than the original condition was produced. The inevitable contraction was impossible to avert, and I abandoned the operation.

It would be unprofitable and is unnecessary to enumerate the many operations that have been proposed for this deplorable condition. Suffice it to say that I have finally settled upon an operation that has proved most satisfactory to me and to my patients. I make no claims for originality in this operation of course, but owing to the unsatisfactory result obtained in most operations of this nature, I feel that perhaps I may be pardoned in detailing the various steps of the operation that has proved most successful in my hands. Let us suppose that we have to deal with a case where the eyeball has been removed and where complete cicatrization of both upper and lower lids has occurred. I have not found it necessary to make a canthotomy. I have found it best to operate upon one lid at a time and I usually first select the lower lid. By incision with knife and scissors, I completely open the lower portion of the socket and thoroughly separate the socket from the lower lid. I then wait until bleeding has entirely ceased. I cut a piece of block tin in half moon shape so that it can be inserted into the lower portion of the socket. The tin must be as large as can possibly be introduced. Five or six holes are bored in the upper portion of the tin. I then make a very large thin Thiersch graft, large enough to completely cover the tin on both sides. The graft is sutured to the tin by silk sutures, which are passed through both ends of the graft, and through each one of the little holes that have been previously bored, through its upper border. The graft is, of course, raw side out. The graft is kept warm by several immersions in warm, sterile water. I then carefully force the graft covered tin into the lower cul de sac of the socket, which has been previously opened, as hitherto described. I then suture the two lids together in order to assist in holding the graft covered tin in position. It may be necessary to slightly undermine the upper lid in doing this, and I sometimes overlap the lower lid with the slightly undermined upper lid, running the sutures through the upper lid and through the skin covering the lower lid a little way down from the palpebral edge of the lower lid. I then make a little wad of gauze and place it over the upper lid in such a manner as to assist in pressing the tin down into the lower cul de sac as far as possible. This is supplemented by more gauze and a tight bandage. This bandage is left in position for about two days and then gently removed, the parts gently cleaned and a fresh similar bandage applied.

I frequently remove the internal sutures, uniting the upper with the lower lid at the first dressing,

but always do so, at all events, at the second dressing. After the first dressing the eye is dressed every day, being careful to do it as gently as possible so as not to disturb the parts any more than is necessary. At the end of about six or seven days the sutures are all removed, the lids separated as much as possible and gently irrigated. In seven or eight days the block of tin is very gently removed and gentle irrigation applied, the tin cleaned and replaced without sutures. This is done a number of times. Loose portions of unattached graft are from time to time very carefully and gently cut off with sharp scissors, being careful not to disturb the attached graft. Most of the graft will "take," but some of it, of course, will not. In most instances a very good lower cul de sac will thus be produced. The cul de sac should be carefully looked after every day and if a tendency exists for any reattachment between the cicatricial tissue of the orbit and the newly formed lower lid, it should be gradually separated with a probe. In a few weeks the same operation can be performed upon the upper lid. It not infrequently happens that minor operations of a similar nature should be performed upon portions of the upper and lower lid that seem to be unsatisfactory. As a rule, however, I have found that one operation upon the lower lid and another upon the upper lid is sufficient, but if not, subsequent minor operations should be performed, as already stated.

In my hands this operation has proved almost universally successful and I may say that my colleague, Casey A. Wood, has also obtained most satisfactory results from this operation. Of course, operations should not be performed until the orbital cicatrization has settled down into a permanent condition. I believe that skin grafts are much more successful than mucous grafts of any nature. I am well aware that skin grafts are not ideal; they never look like mucous membrane and produce more or less irritation, but nevertheless, they are, in my hands, the most satisfactory grafts.

This operation can also be performed in case the eyeball remains in the socket, but is adherent to a greater or less extent to either the upper or lower lid. In such cases, of course, care must be taken not to injure the cornea by the block tin, which must be shaped to avoid rubbing on the cornea.

7 WEST MADISON STREET.

Incidence of Chronic Focal Infection in Chronic Diseases.—Lovell Langstroth (*American Journal of the Medical Sciences*, February, 1918) from a study of the histories of the patients seen in the last two and a half years in the medical clinic of the University of California Hospital finds that eighty-four per cent. of the patients with ulcer of the stomach or duodenum, sixty-six per cent. of the acute or subacute cases of arthritis, seventy-three per cent. of the chronic cases of arthritis, and 100 per cent. of gallbladder cases, have been associated with chronic focal infections. The acute and subacute cases responded well after removal of the foci, even to the point of absolute cure. Many of the chronic cases have had less pain and no further progress of the disease.

FORTIFYING THE CHILD AGAINST MENTAL DISORDERS.*

By EVERETT S. ELWOOD,

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There are so many different types of mental disorders from which the child should be protected and the ways and means of fortifying him against mental disease are so numerous, that it will be impossible here to cover more than a portion of the subject. Much time and energy are being expended in promoting the bodily hygiene of the school child. The promotion of his mental hygiene has not received the attention and support which it deserves. The reticence exhibited by school and health authorities in undertaking the mental health problems is undoubtedly due in a large measure to the superstition which has clung to mental disease for centuries, and to the widespread conviction on the part of both physician and layman that insanity is such an obscure, indefinite, unknown form of human ailment that there is nothing much to be done in the way of its prevention. During the last few years great progress has been made in the study of the various forms of mental disorder, with the result that much definite knowledge has been obtained in regard to its nature, causes, and prevention.

Without attempting to define all of the various kinds of mental disease, let me say that there is no sharp line of demarcation between sanity and insanity, the difference between mental health and mental disease being one of degree rather than kind. Doctor Paton, of Princeton, has defined health as

... a state of mind and body in which the adjustments of the individual to his environment are relatively good, while in disease, of which insanity or mental disorder is a special form, they are insufficient or imperfect. The mechanism by which man makes his more complex adjustments is the nervous system, including the brain. When the structure of this mechanism becomes impaired, or if its orderly function is disturbed, then the individual's adjusting capacity is lessened or destroyed and he is said to be insane. If an individual's capacity for readjustment on meeting new conditions be not seriously overtaken an equilibrium may soon be restored when unusual conditions tend to disturb the balance; but should the altered relationships among the activities transcend the capacity for readjustment, then the disturbance may result in those unusual forms of thought, feeling or behavior which are designated as insanity. A false idea may temporarily tyrannize our thought process, disappointment may bring us to the verge of despair; and uncontrolled passion may temporarily hold reason in check, without raising a question as to our sanity. It is only when the idea becomes fixed or despondency is our customary mood, or anger or fear holds sway over all our emotions, that we are, in the common acceptance of the term, declared to be insane. There is no broad gap between sanity and insanity. People have naively assumed too great a disparity between the mental process of the sane and the insane. Their crude distinction between conditions which are essentially alike has brought untold misery upon the human race, has deprived thousands of hope, driven others to despair, and prevented us from knowing ourselves.

With this definition of insanity in mind, let us consider some of its causes and some of the steps which may be taken in fortifying the child against them.

The causes of mental maladjustment may be divided into two classes, those of a material nature which enter from without and those of a functional nature which apparently develop within the brain itself. The first class is comprised principally of various poisons which are introduced into or developed within the system and carried to the brain through the bloodstream. The second class might be described as bad mental habits, and their accompanying results often have their origin in childhood, and may be caused by unwise parental training, insufficient or improper school training, unfavorable heredity, or a trying and unwholesome environment.

One of the principal poisons which enters the mental machinery from without, greatly impairing its adjusting capacity, and often resulting in permanent mental breakdown, is alcohol. It is impossible to state the exact percentage of mental maladjustment due to alcohol. Several definite forms of insanity, known as the alcohol insanities, are caused almost entirely by the excessive use of alcohol. Of the total of 4,903 first admissions to the New York State hospitals for the insane during the nine months ended June 30, 1916, alcohol was given as the causative factor in 506 cases, which represented 10.3 per cent. The medical profession now believes that many cases of excessive alcoholism occur in individuals who have a psychopathic constitution and who would not be especially stable in their habits of life if they had not resorted to alcohol in excess. This knowledge does not lessen the serious effects of alcohol upon the mental processes, but shows the great necessity of throwing every safeguard around the individual who is lacking in resistance, or who is especially susceptible to its effects. The fortification of the child against the alcoholic insanities can best be accomplished by giving him a thorough knowledge of its effects and developing his power of resistance to temptation. In this day of keen competition, every man needs the highest possible development of his mental faculties. This is not only impossible in the presence of continued use of alcohol, but permanent impairment of the mind is sure to follow its continued use.

The second principal external cause of serious mental disorder is the germ of a disease known as syphilis. This is the essential cause of general paralysis, a mental disease responsible for about 14.5 per cent. of all first admissions, and for nearly one fifth of all male admissions to hospitals for the insane in New York State. More than twenty-two per cent. of male patients admitted to insane hospitals from the cities in this country are suffering from general paralysis. More deaths resulted in New York State from general paralysis in 1911 than from smallpox in the whole registration area of the United States since 1908. Half as many deaths are known to occur every year from general paralysis as from typhoid fever. It is believed that a considerable number of deaths from general paralysis, when occurring outside of institutions, are reported as "softening of the brain" or by some other indefinite term, and the prevalence of general paralysis is, therefore, far greater than mortality statistics would indicate. This disease runs

*Read at the Tenth Congress of the American School Hygiene Association, June 9, 1917.

a uniformly fatal course, the average duration of which is from two to five years. It attacks people who have to all appearances recovered from syphilis, and most frequently in the fourth decade of life, when their usefulness to the community and to their families should be the greatest. Of course, the prevention of general paralysis depends wholly upon the prevention of syphilis, a well defined field of effort in preventive medicine.

The question of teaching sex hygiene in the public schools has met with much opposition. While I cannot take the time to discuss its merits or possible dangers, I must say that I believe that our youth are really entitled to a clear knowledge of the fearful ravages of the diseases generally associated with immoral living. Knowledge of these results both to the individual and to his future family may not insure proper conduct in all individuals, nevertheless it will assist many in resisting temptation and avoiding dissipation. If we are to conserve that type of citizenship of which we have always been proud, the school must as far as practicable supply the training which a large number of homes no longer furnish.

The psychopathic ward of Bellevue Hospital recently contained a pretty little girl nine years old suffering from general paralysis. This little girl was born in a country founded upon the principle that all are created free and equal, yet all of her rights to happiness and even to life itself had been violated, for she had inherited syphilis as a result of her father's early dissipation and no medicine could check it from resulting in premature death. If the same little girl had been injured while playing on the streets by a careless truck driver, the newspapers and the courts would have come to her defense, and public sentiment would have demanded that this driver be held responsible. Why should not the little girl in the hospital receive as much defense against one of the worst forms of human injury as if she had been run down upon the streets? Is society justified in denying to the next generation the full right to health and happiness for the sake of concealing the sins of the present generation?

Let us now consider those causes of mental disorder which seem to arise within the mind itself, which have been referred to as internal causes or bad mental habits. One of the most common of the bad mental habits is excessive worry. There are few of us who do not worry over something or other at least once in a while. Many of us carry about with us continually a large bundle of worries and anxieties which may increase our burdens and yet be insufficient to jeopardize our mental health. It is easy enough to say, "Don't worry" to our friend who is deeply disturbed by his problems and difficulties. Such advice is worth nothing unless we do follow it by more definite assistance. Many minor worries may be eliminated from our daily list. For example, we give too much attention to the condition of the weather, and if the weather is inclined to be wet or stormy, we feel consequently depressed, consoling each other upon the fact that it is such a bad day, that little can be accomplished. Some one has said there is no such thing as bad weather, and I am inclined to agree with him, at

least for the sake of the good mental effect of maintaining such an attitude toward the conditions of life over which we have no control. Many of us spend too much time reviewing the history of our past lives and wishing that certain things had been different from what they were. It is possible so to brood over the unchangeable past that a state of severe mental distress is produced. The child should be led to turn his attention to the present and the future, remembering the past only for the lessons it has taught. He should be shown the folly of keeping his future behind him.

Another indication of a lack of good mental adjustment is excessive introspection, often accompanied by a feeling of oversensitiveness and inferiority. The delicate child needs particular protection against such disturbing mental habits during the age of puberty. If one's resources appear to be inadequate to the problems before him, belittling these resources only tends to increase the apparent size of the problems without helping in their solution. One form of maladjustment often results in developing what Doctor Hoch has called a shut in personality. This usually occurs in the child who has inherited a very sensitive makeup, who recoils from criticism, who has strong tendencies toward brooding and introspection. I quote Doctor Hoch's record of such a case:

CASE.—This patient is a young woman about whose early life we are fairly well informed. We are told that even as a little child she was hard to manage and took advice badly. While I cannot find any very concrete examples or instances under which this behavior manifested itself, the notes give enough to show that the difficulties which the parents and teachers experienced in managing the child were not due to any very active traits on the part of the latter, not to that kind of boisterous childish vivacity which is seen in normal children who are hard to manage, but rather to a passive resistance. She got along pretty well when left alone, but even simple adaptations were difficult for her. Thus it troubled her when things were touched, or when she was interfered with in any way. Her reaction then to such interferences was, however, not an aggressive one from which a certain healthy shaping of the situation might be expected, but a rather fruitless irritation and more particularly, as is stated, "a going off by herself." Again, and quite consistent with what we have said, we are told that she played little with other children, was apt to cry when things did not go just her way, and then left her playmates. It is also specifically said that she was not liked by others. Children have a quick appreciation of barriers which another child, or for that matter an adult, erects about him, and shun that kind of personality. In company she was silent, took no part in what was going on, and very often left the room. She seemed ill at ease and bashful. But she was not stupid, on the contrary rather above the average in intelligence, and she worked hard at school and had good marks. At sixteen she became overreligious, a change which was not accounted for by anything that happened in her environment. Then came a year at a business college which, so far as the work was concerned, was also passed satisfactorily, though her general traits did not change. But when the time came to use her knowledge, that is, to change from a more receptive situation, which makes infinitely less demands than the more difficult task of stepping out into the world of responsibility, then she was unprepared and shrank from it; instead of taking positions which evidently under the force of example and promptings from home she did seek for a time, she found fault with every one, and remained inactive. She married at eighteen, and after the birth of the first child developed a serious mental disorder, from which she has not and will not recover.

The form of mental disease described by Doctor Hoch is known as dementia præcox and consti-

tates eighteen per cent. of all admissions to the New York State hospitals for the insane. Doctor Campbell, of Johns Hopkins, believes that thirty-nine per cent. of this type of insanity is preventable.

The fortification of the child against mental disorders arising from internal causes depends largely upon the early recognition of some of the danger signals which I have just described. Of course, many individuals may present one or more of these indications of mental disorder and yet never become insane. They may drift into lives of inefficiency and failure, which should be prevented, if possible, just as much as the more serious and complete mental breakdown. The appearance of excessive introspection, brooding over the impossible, oversensitiveness accompanied by feeling of inferiority, and worry over trifles, should be sufficient to warn the teacher and result in bringing the individual to the attention and treatment of a physician skilled in mental diseases. If his advice is sought early he will be able to prevent many serious mental disorders and to check a much larger number of individuals from developing a state of mental inefficiency which would mean failure and discouragement throughout their whole lives. A child can be taught to look his worries straight in the face. He can be helped to analyze his fears by carefully examining the causes of his anxiety, and in so doing he will unconsciously minimize much of the emotional element which is disturbing to mental health. The wise and progressive teacher will occasionally comfort the child by assuring him that all make mistakes sometimes. She will teach him without his knowing that he is being taught, that one's anxieties and worries and discontent depend more upon the state of mind than upon the environment. A normal state of mind is undoubtedly one that finds a certain amount of satisfaction in daily life. No individual can hope to find a sufficient amount of happiness outside of his daily work to keep him in the best of mental health, if his daily work is the source of constant distress and displeasure. If he is unable to change the nature of his occupation he should do his utmost to derive therefrom a certain amount of pleasure and satisfaction. If, for instance, a child dislikes his daily school, as we know some children do, much better cooperation on his part can be secured if the teacher is able to show him the pleasure of achievement, the satisfaction of having really done something. The features in his work which really interest him can be emphasized and the day is coming when our school curriculum to child, and less adjustment of child to curriculum.

In New York State there has been established a series of twenty-seven mental clinics under the direction of the physicians of the State hospitals for the insane, at which any child, or adult, may receive expert medical advice and treatment in regard to mental disease. These clinics constitute a part of the State Hospital Commission's program of mental hygiene. The State Department of Education and the State Hospital Commission are cooperating in the development of a plan whereby these clinics may be used for the examination of school children who give evidence to the medical inspector of needing advice and treatment by a

psychiatrist. These clinics are also attended by a trained social worker who can cooperate with the teacher in bringing about a better adjustment between the child and his environment by modifying, wherever possible, improper and distressing home conditions.

Fortifying the child against mental disorders consists, then, in giving him definite information as to the effects of alcohol and syphilis upon the central nervous system. He should also be taught the great value of meeting with courage the problems of his daily life, the danger of excessive introspection and brooding over the impossibilities of life, and the necessity of finding in his life work a certain amount of satisfaction. The teacher must watch for danger signals and bring those children who make poor mental adjustment to life and its problems to the attention of a physician familiar with the nature and treatment of mental disease. I hope the time is not far distant when we shall be able to give the child a certain amount of instruction in the fundamentals of mental hygiene, including a certain amount of psychology and the study of the various factors which make up the personality, emphasizing and developing wholesome traits of character and suppressing those that are undesirable. The Horace Mann School of New York has already started in an experimental way a study of the personality of the school child. His various traits, habits, and abilities are estimated as accurately as possible when he enters the school and an effort made to develop those that are desirable and which make for efficiency and success.

Herbert Spencer has defined life as a series of adjustments of inner relations to outer relations. If this be true, we must admit that the chief aim of education should be to develop in so far as possible the adjusting capacity of the child. There is much to commend in modern methods of education as tending toward this end. Vocational guidance is finding out what the individual is fitted for, or, in other words, the environment to which he can hope to make a successful adjustment. Vocational training then steps in and develops his capacity for his chosen line of endeavor. We no longer believe that all boys and girls should have advanced academic training. Many mental breakdowns are a sad testimonial to the fact that all children cannot survive such training. There is still much to be learned in the field of mental hygiene and its application to the methods and principles of education. Mental health and mental efficiency will be best promoted when we have an effective and active co-operation between teacher, parent, school physician, and social worker.

Radium in the Treatment of Hodgkin's Disease.—Harry B. Kurtz (*Urologic and Cutaneous Review*, February, 1918) reports a case treated with radium with great improvement. The dose at first was fifty mgm. of radium in tubes and ten mgm. of varnish applicator properly screened for 1,080 mgm. hours. It varied from ten to sixty mgm. and the total number of mgm. hours was 5,100.

THE WASSERMANN COMPLEMENT FIXATION TEST FOR SYPHILIS.

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III. THE PREPARATION AND TITRATION OF THE LIPOID ANTIGEN, THE PREPARATION OF THE SERUM OF THE PATIENT, AND THE TECHNIC OF THE PERFORMANCE OF THE TEST.

"While lipoidal extracts," to quote Kolmer (1), "as well as normal and luetic serums may separately absorb or fix small amounts of complement, a mixture of a suitable extract and syphilitic serum is capable of fixing large amounts of complement, and this constitutes the main principle and all that is definitely known of the syphilis reaction." The serum of a syphilitic contains a variable amount of a peculiar substance, which is called, by analogy, "syphilis antibody." It is not a true antibody in the common acceptance of the term. An antibody is a substance produced by the body cells of a host in response to the stimulus provided by an antigen, and which is directly antagonistic to the antigen. The commonly employed Wassermann antigen is an alcoholic solution of tissue lipoids. As Benjamin White has pointed out (2), protein free preparations of lipid are totally devoid of the distinguishing characteristic of antigens, to wit, the property of stimulating antibody production. Nevertheless, the mixture of a suitable lipid preparation and the serum of a syphilitic is capable of fixing large amounts of complement. The reaction is analogous to an antigen antibody complement affair. The determination of a positive or of a negative Wassermann reaction depends upon the fixation or nonfixation of complement. The presence in the test tube of free complement, after a suitable period of incubation, predicates nonfixation, and is evidence of the absence of syphilis antibody in the patient's serum. On the other hand, the absence of free complement, likewise after a suitable incubation period, indicates fixation and evidences the presence of syphilis antibody in the patient's serum.

It is thus apparent that the essentials to a test for the presence or absence of syphilis antibody are the following: 1, the proper dose of a suitable antigen; 2, a suitable quantity of the serum of the patient; 3, complement which has been properly adjusted to the other elements of the hemolytic system; 4, suitable conditions of incubation. As I pointed out recently (3), a lipid antigen which seems to meet the requirements of the test when suitable conditions of incubation are provided, namely 8° C. for four to twenty-four hours, is the simple alcoholic extract of beef heart. It is made as follows: Ten grams of chopped beef heart are extracted in 100 c. c. of absolute alcohol, at 37° C., for two months, in a tightly stoppered vessel. The mixture is shaken at frequent intervals during that time. Then the preparation is filtered through paper, the filtrate being essentially the warm alcohol soluble lipoids of the heart muscle. This filtrate is refrigerated over night. A powdery,

gray precipitate forms, which is the hot alcohol soluble, cold alcohol insoluble fraction. This is removed by a second filtration. The second filtrate constitutes B. H. P., plain or simple alcoholic extract of beef heart.

To determine the proper dose of the preparation, a series of titrations are performed. They are for hemolytic effect, for antilytic or anticomplementary action; and for antigenic property. For use in the titrations a ten per cent. emulsion of the alcoholic solution is made in 0.9 per cent. sodium chloride solution. It is a matter of some importance to make the emulsion by adding the salt solution to the alcoholic solution drop by drop, with constant agitation. Thus one takes one c. c. of the alcoholic solution and adds thereto, drop by drop, one c. c. of salt solution. By proceeding in this manner, a milky emulsion is produced. It is then diluted by adding eight c. c. of salt solution. If, on the contrary, the nine c. c. of salt solution are added to the alcoholic solution all at once, without agitation, or if the alcoholic solution is added to the salt solution, there results not a milky emulsion, but an opalescent, translucent solution. There is said to be a marked difference in the antigenic values of the two preparations, the emulsion being far more antigenic than is the solution. The former is in such a physical state as to present a larger absorbing surface.

An antigen may in and of itself hemolyze red cells. It may, in and of itself, fix complement. It is therefore important to test out each preparation of antigen for its hemolytic effect and for its antilytic action. Increasing quantities of the emulsion are put in contact with constant quantities of red cells and the mixtures are incubated under suitable conditions. An opportunity is thus allowed for the hemolytic effect of an antigen, if it exists in the quantities used in the titration, to manifest itself. The titration for hemolytic effect is shown in Table I. Again, increasing quantities of the emulsion are mixed with constant quantities of complement and incubated suitably. An opportunity is thus afforded for the antigen, in the quantities used, to fix complement, if it will. Fixation or nonfixation is indicated in the usual manner. The titration for antilytic action is depicted in Table II.

TABLE I.

TITRATION OF LIPOID ANTIGEN: 1. FOR HEMOLYTIC EFFECT.

Antigen (1% emulsion).....	1	2	3	4	5
Salt solution	7	6	5	4	3
R. b. c. (5% suspension).....	2	2	2	2	2

Incubate at 40° C. for 30 minutes and read for hemolysis. There should be no hemolysis in any of the tubes.

TABLE II.

TITRATION OF LIPOID ANTIGEN: 2. FOR ANTILYTIC ACTION.

Antigen (10% emulsion).....	1	2	3	4	5
Salt solution	3	2	1	0	0
Complement	two units in each tube				

Incubate for 4 hours at 8° C. Then add 2 units ofambo and 1 unit of r. b. c. to each tube and immerse in water bath at 40° C. for 30 minutes. There should be complete hemolysis in all of the tubes. If there is any interference with hemolysis it is due to the antilytic action of the antigen.

It is very exceptional to find a lipid antigen prepared as outlined above which is hemolytic in the quantities tested. It is not unusual, however, to

find such an antigen somewhat antilytic in the fourth and fifth tubes. When such is the case a more dilute emulsion must be used, as, for instance, an eight, five or even two per cent. emulsion. It is manifestly impossible to employ successfully in tests a quantity of antigen which is in itself sufficient either to effect hemolysis or to fix complement. One should never employ a quantity larger than one quarter of the largest quantity which is not hemolytic nor antilytic.

The question now arises: Is such a quantity of a given antigen sufficient to fix complement in the presence of syphilitic serum? To supply an answer it is necessary to perform a third titration, the titration for antigenic property. Increasing quantities of the emulsion are mixed with constant quantities of known syphilitic serum and of complement, and the mixtures are incubated. Thus there is an opportunity provided for the occurrence of specific fixation. Its occurrence or not is indicated in the usual way. The third titration is represented in Table III. By means of the titrations of the anti-

TABLE III.

TITRATION OF LIPOID ANTIGEN: 3. FOR ANTIGENIC PROPERTY.

Antigen (1% emulsion) . . .	.01	.02	.05	.1	.2	0	0	0	0
Antigen (10% emulsion) . .	0	0	0	0	0	.05	.1	.2	.3
Salt solution . . . . .	.3	.3	.3	.2	.1	.3	.2	.1	.2
Leucic serum* (2% solution)	.1	.1	.1	.1	.1	.1	.1	.1	.2
Complement	two units in each tube								

Incubate for 4 hours at 8° C. Then add 2 units of ambo and 1 unit of r. b. c. and put into water bath at 40° C. for 30 minutes. At the expiration of that time there should be complete hemolysis in the ninth tube. There will be various degrees of hemolysis, from complete to none, indicating various degrees of fixation of complement, from none to complete, in the other eight tubes. The smallest quantity of antigen which effects complete complement fixation is the antigenic quantity.

gen we determine, first, how much of it may be used and, second, how much is sufficient to effect complete complement fixation. How much may be used is determined by the hemolytic and antilytic titrations. It is one fourth as much as the largest quantity which is not hemolytic nor antilytic. How much is sufficient is indicated by the results of the titration for antigenic property. For example, let us suppose that 0.4 c. c. of the ten per cent. emulsion is the largest quantity which is not hemolytic nor antilytic. It is apparent that one quarter of that quantity, or 0.1 c. c. of the ten per cent. emulsion, is the largest quantity that may be used. Suppose that it is found that 0.05 c. c. of the one per cent. emulsion is sufficient to effect complete complement fixation, is, in other words, the antigenic quantity. It is immediately apparent that the quantity which may be safely used is twenty times as great as the quantity which suffices and is therefore eminently suitable for use, allowing, as it does, a large margin of safety. The dose of this particular preparation is, therefore, 0.1 c. c. of the ten per cent. emulsion.

Serum of the patient.—The preparation of the serum of the patient is a very simple matter. It is well to draw from two to five c. c. of blood and it is most conveniently taken, as a rule, from the vein at the bend of the elbow, the median basilic or the median cephalic. The hollow needle which is intro-

duced to the vein should, of course, be sterile. The container for the blood may or may not be sterile. If the blood is to be kept for several days before use, or if it is to be sent any distance, it is imperative to keep it in a sterile condition. If, however, it is to be used very soon and may be refrigerated in the meantime, it is not necessary to employ a sterile container. Nevertheless, if one is always careful to see to it that the specimen is not unnecessarily contaminated, he is saved the bother and inconvenience which not infrequently occur to him who handles his specimens carelessly. Sometimes it is extremely difficult to obtain a specimen of blood and the difficulty occurs frequently with a specimen the report upon which is anxiously awaited by the clinician. If such a specimen should spoil as a result of careless handling, the discomfiture of the guilty person is very great.

Although as a rule the veins at the bend of the elbow are the easiest to puncture, sometimes, for one cause or another, it is quite impossible to use them. The patient may have had his veins maltreated on prior occasions, so that they have become thrombosed. It is often possible then to puncture the internal or long saphenous vein as it passes above the internal condyle. The skin may be scarified and cupped or the finger or ear pricked and the blood collected in a Wright's capsule. When the patient is an infant it is a very easy matter to puncture the superior longitudinal sinus through the anterior fontanelle. The procedure is fraught with very little danger, if properly performed, but is rather terrifying to the relatives. A most convenient apparatus is the bleeding tube devised by Dr. Richard M. Taylor (4). He describes it as follows: "The apparatus consists simply of a test tube twenty millimetres in diameter and 150 millimetres in length with a piece of capillary tubing about 70 millimetres long welded to it at right angles at a point slightly below the junction of the middle and upper thirds and with the free end of the tubing ground to fit the standard Luer needle. Previous to sterilization, the tube is plugged with cotton in the usual way and a small test tube placed over the arm and held in position by fitting it snugly over cotton wound about the capillary near its juncture with the large test tube. In this way the entire arm and the inside of the test tube are well protected and may be kept indefinitely without danger of contamination. The needles, after being thoroughly cleaned, dried and sharpened, are put in small tubes containing about one c. c. of liquid paraffin. These are all sterilized in the dry oven. By this method they are kept in excellent condition and the whole apparatus is ready for use at any moment. . . . The apparatus has proved so simple and convenient that the laboratory interns employ it exclusively for taking blood for all purposes."

Another form of apparatus which is exceptionally convenient is the Keidel tube. The only fault to be found with it is with the gauge of the needle, which is very narrow. In the absence of either of these special bleeding tubes one always has recourse to the syringe and needle. Of the three types commonly employed, the Luer, the Reichert, and the Behring antitoxin, the first is by far the most satisfactory. As a last resort one may use the open

*A specimen of serum which has given a strongly positive Wassermann reaction, or better, a mixture of several such serums.

needle, holding a test tube under the outer end. This works very well in the case of a large veined adult. When one has a large number of specimens to take in a short time, and when the cost of the apparatus is a consideration, as in a genitourinary clinic, he finds the open needle preferable to any of the other instruments.

If the blood is handled aseptically it makes little difference whether it be kept in the ice box, in the incubator, or at room temperature. Blood clot contracts more completely in the heat than in the cold. Therefore, if the maximum yield of serum is desired it is well to incubate the specimen. Naturally, incubation is to be carefully avoided when the specimen is not sterile. Serum should not remain in contact with the clot more than twenty-four hours. It should be carefully removed at the end of that time, rendered cell free by centrifugalization, and refrigerated until used. Serum which is allowed to stand on the clot too long grows antilytic. That is, it develops the property of opposing the action of complement. What substance it is which imparts this property, or just what change occurs in serum when it becomes antilytic, is not known. An antilytic serum, however, is totally unfit for use in the test. Therefore the development of antilytic property is to be carefully avoided.

Blood for use in the Wassermann should not be citrated or oxalated. Plasma is unfit for use for the reason that fibrinogen coagulates at the inactivating temperature. Just before use in the test the serums are inactivated. By this is meant that the native complement is destroyed. The inactivation is accomplished by immersing the specimens in a water bath, the temperature of which is 56°C ., for thirty minutes. Immediately thereafter the tests are set up. It is very important to avoid inactivation of the serums until just before use. After inactivation serums rapidly grow antilytic. It is true that a second heating at 56°C . for thirty minutes destroys the anticomplementary property, but it is equally true that very frequently a serum which originally gives a strongly positive reaction, when heated twice at 56°C ., thirty minutes each time, thereafter gives a weakly positive or negative reaction. Ruediger (5) has reported the use of glycerin as an agent to combat the development of antilytic properties in serum. He found that when freshly inactivated sera were mixed with equal volumes of glycerin they did not become anticomplementary in eleven days. Occasionally a serum is found which is persistently antilytic, even from the very beginning. Repeated specimens at varying intervals are all antilytic. One strikes such a case probably once in a thousand.

Technic of the performance of the test.—The technic employed in the Department of the Laboratories of the New York Post-Graduate Medical School and Hospital is based upon that of the original Wassermann reaction, from which it differs in nonessential details. There is no departure from the original principles; no short cuts are introduced; all of the original checks and controls are studiously observed. The original Wassermann reaction was a test the total volume of which was five c. c.; our test is a one fifth Wassermann, total volume one c. c. An economy in the materials of the test is effected by thus reducing the total volume of the

test. Relatively the same amounts of reagents are used. In the original Wassermann reaction an aqueous extract of the liver of a syphilitic fetus was employed as antigen of the first system. In the light of our knowledge concerning the biological nonspecificity of the reaction, and in view of the greater practical specificity of the newer lipid antigens, it seems to be without point to continue to use the original antigen. We employ, for reasons detailed in a previous paper (3), a simple alcoholic extract of heart. The third modification concerns the conditions of incubation for fixation. As we have remarked heretofore (6), matters of great importance in the Wassermann test "are the temperature and the length of time employed for the first part of the reaction, the time during which takes place the union between antigen and serum antibody and the binding or destruction of complement. Wassermann and most students of the subject have allowed this part of the reaction to take place at 37°C . Against this common practice may be urged the well recognized fact that complement spontaneously loses its power very much more rapidly at 37°C . than at 8° or 10°C ., and the further well known fact that antigen and specific immune body unite readily even at a temperature of 0°C . McNeil (7) has presented the results of comparative tests upon 466 persons, most of whom were presumably syphilitic, employing for each case an incubation at 37°C . in one test and an incubation at icebox temperature in the other. The antigen was the crude alcoholic extract. At 37°C . he obtained 176 positive reactions, 273 negative, and seventeen doubtful. At the icebox temperature he obtained 224 positive reactions, 212 negative, and thirty doubtful. This amounted to an increase in positive results of 10.3 per cent. Coca and L'Esperance (8) have also obtained positive reactions by the icebox method with luetic serums which gave negative results in the incubator." Our experience also has demonstrated the very great superiority of icebox fixation in comparison with that at 37°C ., and we now employ it solely (3).

The setup of the one fifth Wassermann test as employed by us is as follows: Three tubes are used in the test. The tubes are three inches long and three eighths inch in diameter. The first reagent put into the tubes is the patient's serum, 0.02 c. c., 0.05 c. c., and 0.1 c. c., in the first, second, and third tubes, respectively. Three tenths c. c. of 0.9 per cent. salt solution is then added to each tube, a dose of antigen is put into each of tubes 1 and 2, and two units of complement are added to each tube. A schematic representation of the setup is shown in Table IV. The tubes are well

TABLE IV.

THE SETUP OF THE ONE FIFTH WASSERMANN TEST.

Patients serum .....	.02	.05	.1
Salt solution .....	.3	.3	.3
Antigen emulsion	1.	.1	0
Complement	two units in each tube		

shaken and put into the icebox for at least four hours, or, if more convenient, overnight. Two units of ambo and one unit of r. b. c. are then added and the tubes immersed in a water bath at 40°C ., until the control tubes show complete hemolysis. The controls are two in number, serum control and

antigen control. Tube 3 is the serum control in each case. An antigen control is run along with each series of tests. It is depicted in Table V. All

TABLE V.

THE ANTIGEN CONTROL.

Antigen emulsion .....	.1	.2	.3	.4
Salt solution .....			.3	.1
Complement	two units in each tube			

the controls must show complete hemolysis before the tests can be read. If a serum control does not show hemolysis, that serum is antilytic and in such a case fixation in tubes 1 and 2 is of no significance. If the antigen controls show no hemolysis it is quite impossible to read any of the tests. If the controls behave properly one may read and interpret the reactions in tubes 1 and 2. There may be complete hemolysis or complete absence of hemolysis or any degree of partial hemolysis. The degrees of hemolysis, the symbols employed to represent these degrees and the interpretation in terms of fixation of complement are shown in Table VI.

TABLE VI.

INTERPRETATION OF READINGS.

Complete hemolysis	0 or —	no fixation
75% hemolysis	1 +	25% fixation
50% hemolysis	2 +	50% fixation
25% hemolysis	3 +	75% fixation
No hemolysis	4 +	complete fixation

A 4+ reaction is a very strongly positive reaction; a 3+ reaction is strongly positive; 2+, positive; 1+, weakly positive or doubtful; 0 or —, negative. In our experience a positive reaction obtained with this technic has been evidence only of active syphilis. We have never observed a false positive reaction with the simple alcoholic extract of beef heart and with incubation for fixation in the icebox. The interpretation of a negative reaction in a known syphilitic, to quote Dr. R. M. Taylor (9), "depends entirely upon the existing circumstances; for example, if taken during or shortly after medication it would seem to indicate that for the time being the treatment is efficient, but by no means signifies that the patient is spirochete free, or that he will not suffer a relapse; but if taken some time after the course of treatment, the chances of a relapse are in inverse proportion to the time interval." Stuart Graves (10) has shown that the Wassermann reaction performed on post mortem blood is a reliable aid to the diagnosis of syphilis. Concerning the reaction in general he writes: "The Wassermann reaction is a delicate biochemical test. No diagnostic method in the history of medicine has been more grossly abused or more dishonestly exploited. . . . In the hands of a competent serologist the Wassermann is the most constant and delicate single symptom of syphilis," according to Kolmer (1).

I am inclined to believe that at times too much is expected of the Wassermann test. One feels that by mixing together certain mysterious derivatives of beef, sheep, guinea pig, rabbit, and man, shaking them thoroughly and putting them in the incubator or icebox for awhile, and—Presto!—one can reach into the test tube and pull out a ready made diagnosis of anything from dandruff to constipation. It really cannot be done. When one appreciates just what the Wassermann reaction is

and just how it is done, one realizes that the test has very definite limitations. One is then better able to interpret reports and derives a correspondingly greater amount of information therefrom.

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THE DIFFERENTIAL BLOOD COUNT. THE ARNETH FORMULA AND DOEHLE'S INCLUSION BODIES IN PULMONARY TUBERCULOSIS.

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MATERIAL AND METHOD.

In this study, fifty cases of pulmonary tuberculosis in various stages of the disease and at various ages were selected. Blood from the tip of a finger was obtained in the usual manner, and coverslip preparations were made. The coverslips used were all scrupulously clean to insure an even spreading of the film. The best method to obtain thoroughly clean coverslips was found to soak them in van Ermengen's fluid—sulphuric acid, sixty parts; potassium bichromate, sixty parts; water, 1,000 parts—for several days, washing them in running water over night, rinsing the slips in distilled water, and preserving them in ninety-five per cent. alcohol until ready for use. Just before use they were taken out of the alcohol with clean forceps, wiped with a piece of soft old linen and then thoroughly polished with a soft piece of silk. They were handled only in forceps. It was found that this somewhat complex method insured well spread preparations, showing the white cells evenly distributed, and repaying well the time spent in their cleaning by greatly facilitating the counts made. The stain used was Leishman's employed in the usual manner. Manson's borax methylene blue stain, after previous alcohol fixation, was used in some instances, especially for the study of the Arneith's formula and the Doehle's inclusion bodies, but, since it appeared to possess no advantage, its use was discontinued. On the average 400 white blood cells for the differential picture and 100 polymorphonuclear neutrophils for Arneith's formula were counted. In searching for Doehle's inclusion bodies no definite number of cells were counted. It was soon found that the estimation of the percentage of cells containing these bodies would give no special information.

Most of the patients on whom this study was made were in the service of Dr. A. C. Morgan at the Philadelphia General Hospital. Doctor Morgan kindly gave the data as to the stage and clinical picture of the disease, without having seen the

blood counts. The cases were divided into incipient, moderately advanced, and advanced cases, and these were termed stages I, II, III, respectively. The second and third stages were subdivided into bed patients and ambulatory patients. The latter class usually showed little or no rise in temperature, and although possessing as much lung involvement as the corresponding bed patients, yet was in better general physical condition.

A classification such as the above is, of course, subject greatly to the personal equation, but, since all the cases were so grouped before the blood study was made, it is felt that the work was done without bias. In practically all our patients tubercle bacilli were demonstrated in the sputum. The few in which this was not the case, the clinical picture was so definite that no doubt as to the diagnosis existed. The majority of our patients were between the ages of thirty to fifty years; the average age for the entire group was 32.5 years.

The blood was obtained just before the noon meal, six hours having elapsed since breakfast; in this manner, digestion leucocytosis was avoided. Of the fifty cases thirty-three were male, seventeen female; forty whites, ten negroes.

OBJECT OF STUDY.

The object of this work was: 1, to study the differential white blood count in the various stages of tuberculous patients of varying ages; 2, to study the Arneith formula of these patients; 3, to ascertain whether Doehle's leucocytic inclusion bodies are present; 4, to compare the results obtained and to give, if possible, any relation between these results and the clinical picture.

THE DIFFERENTIAL LEUCOCYTE COUNT.

The following cells have been enumerated: 1, polymorphonuclear neutrophilic leucocytes; 2, polymorphonuclear basophilic leucocytes; 3, polymorphonuclear eosinophilic leucocytes; 4, lymphocytes; 5, transitional cells—endotheliocytes—and large mononuclear leucocytes. At first the large or immature lymphocytes and the small or mature forms were grouped separately. It was found, however, that so many gradations are present that a separation possesses no decided value. The transitional cells are largest of the white cells in the blood stream. Their nucleus is usually somewhat indented, but may possess various shapes. With Leishman's stain the nucleus was a shade lighter in color than the lymphocytic nucleus, while the protoplasm had a distinctly grayish blue, cloudy appearance, differing markedly from the very pale blue, clear protoplasm of the large lymphocytes, and the dense robin's egg blue of the small lymphocytes. Azurophilic granules occur less often and less distinctly in the transitional than in the lymphocytic cells. The large mononuclear leucocytes were grouped here since their small number—0.2 per cent.—did not merit a separate class. The cell corresponds to Törk's irritation form or Pappenheim's plasma cell. Both its nucleus and protoplasm stain very deeply, as deep as the small lymphocyte. Since the cells are as large or larger than polymorphonuclear leucocytes they cannot be mistaken for large lymphocytes or other cells. The normal blood picture as given by various writers on hematology, differs so markedly that one

is unable to accept any one writer's percentage of leucocytes as a standard. The comparatively recent studies of Warfield (1) in Wisconsin, Miller (2) in Baltimore, and Bunting (3) in Wisconsin well illustrate the above, and give a clear survey over the literature. In a general way the following percentages were taken as the normal: polymorphonuclear neutrophilic leucocytes, fifty to sixty-five per cent.; polymorphonuclear basophilic leucocytes, 0.5 to 1.5 per cent.; polymorphonuclear eosinophilic leucocytes, one to four per cent.; lymphocytes, twenty to thirty per cent.; transitionals and large mononuclear leucocytes, five to ten per cent.

As to the differential leucocyte count in tuberculosis, we have, of recent writers, the studies of Strickler and Solis-Cohen (4) in Philadelphia, Margaret Lewis in Baltimore, and Richards in Ohio. All of these counts differ as markedly as does the normal blood picture. While much of this must be attributed to the different conception of the various types of leucocytes entertained by the writers, the factor of altitude, climate, mode of living and the like, and the difference in stains employed have a great weight.

Stage	No.	Age	Temp.	Differential Count										Arneith Formula		
				P. N.	P. E.	P. B.	L. Y.	T. M.	I.	II.	III.	IV.	Ind. ex			
I. A.	8	11.5	99.0	56.0	2.5	0.5	21.5	16.5	22.5	34.5	28.5	13	1.5	71.2		
II. A.	8	49.5	98.3	65.0	1.3	0.3	22.1	11.6	26.7	44.6	24.0	3.8	0.6	83.3		
II. B.	10	31.1	100.5	62.0	2.5	2.0	22.6	12.9	31.7	45.3	19.5	4.0	0.2	86.8		
II. Total	9	41.4	99.4	63.0	1.9	1.1	23.3	12.2	29.2	44.9	21.7	3.0	0.4	85.0		
III. A.	7	54.8	97.7	72.5	1.4	3.5	12.2	13.2	54.2	36.7	7.4	0.7	...	95.5		
III. B.	23	35.7	100.6	78.1	0.6	0.1	9.3	11.7	54.6	36.8	8.2	0.4	...	96.6		
III. Total	30	44.5	99.2	75.3	1.0	1.8	10.7	12.4	54.4	36.7	7.8	0.4	...	95.5		
Grand																
Total	50	32.5	99.1	65	1.5	1.1	18.3	13.7	35.3	48.7	19.7	5.7	0.6	83.0		

The accompanying table shows our results. The polymorphonuclear leucocytes average from fifty-six per cent. in Stage I, to sixty-three per cent. in Stage II, to seventy-five per cent. in Stage III. It must not be forgotten that secondary infections, existing in all second and third stage cases of pulmonary tuberculosis influence this probably to a far greater extent than does the original disease. The basophilic and eosinophilic cells show no important changes. The lymphocytic picture has an inverse ratio to the percentage of polynuclear cells. With the low percentage of neutrophilic leucocytes of Stage I we have the highest percentage of lymphocytes—24.5%—in this group. In Stage II, the lymphocytes drop to 22.3 per cent., and in Stage III to 10.7 per cent. The average for the entire group of fifty cases is 18.3 per cent. The transitional cells and large mononuclear leucocytes, while showing some variation in individual cases, average but little in the three stages. In Stage I, 16.5 per cent.; in Stage II, 12.2 per cent.; and in Stage III, 12.4 per cent. occur, giving an average of 13.7 per cent. of the entire group. A further, less marked variation of the various cell percentages is seen in the ambulant and bed patients of stages II and III. The variation is, however, but slight.

Comparing our results with those of others we find that the regular increase in the percentage of neutrophilic leucocytes with the advance of the disease agrees with the findings of other workers as cited by Strickler and Solis-Cohen, likewise the decrease in lymphocytes corresponds to the findings of other writers. The more the lung tissue is

destroyed by both the tubercle bacilli and especially by the pyogenic organism of the secondary infection, the smaller is the percentage of lymphocytes. In cases where a decided clinical improvement has occurred, the percentage of lymphocytic cells was markedly increased above the normal. Thus, for instance, two cases having a lymphocytic percentage of thirty-four and thirty-six respectively, clinically showed marked improvement. The percentage of transitional cells and large mononuclear leucocytes is in excess of the reports recorded. Only Craig (5) had similar results, eight to nine per cent. of transitionals.

The normal percentage given by Warfield is from five to nine, and we are considering this as a normal for Philadelphia. Transitional cells are of myeloid origin, as determined by the oxydase and similar reactions, and are probably the earliest forms of preneutrophilic leucocytes occurring in the bloodstream. Mallory believes that these cells are especially stimulated by the toxins of the tubercle bacilli. Since the number of immature leucocytes—Arneth, classes I and II—is markedly increased as shown below, the increase in the percentage of transitional cells seems readily explainable.

THE ARNETH FORMULA.

In 1904 Arneth divided the neutrophilic leucocytes into five classes in accordance with the number of nuclei, or distinct nuclear lobes they contained. Those cells containing one nucleus are placed in Class I, those possessing two nuclei in Class II, and so on. The formula obtained by him from the examination of fifteen healthy men is as follows:

I	II	III	IV	V
5%	35%	41%	17%	2%

Other workers, cited by Minor and Ringer in their first paper, obtain very similar pictures. The cells of classes I and II, Arneth believes to be immature, less resisting types, while the other groups are considered by him as the adult leucocytes. Arneth complicated the formula somewhat by further subdividing the five classes into cells having a round, a slightly indented, a deeply indented nucleus: nuclei connected by loops, and those entirely separate. Such a refinement, however, has been shown to possess no practical importance and was not adapted by other workers.

Bushnell and Trucholtz devised an index to express, in a single figure, the general picture obtained by Arneth's formula. This index is obtained by adding to the number of cells of Classes I and II, one half the number of cells of Class III. Thus for Arneth's normal blood picture the index would be $5+35+\frac{1}{2} \text{ of } 41=60.5$. The Arneth's formula and consequently its index while showing some variation in different persons, are, as a rule, of much constancy in the same individual during health. In disease, when resistance is lowered, a greater number of young, immature leucocytes, cells of classes I and II, appear in the circulating blood. This is termed a "shift to the left." The term is readily understood if one recalls that, in a written formula, Class I would be to the left of the reader, Class V to the right. When the bodily defenses overcome the bacterial invasion, the formula shifts to the

right, or in other words reapproximates the normal. Arneth believes this classification to be of much value in the prognosis of any given infectious disease. Thus a marked shift to the left, especially if persisting, would be of bad prognostic omen, a fairly stationary picture signifies a bright outlook, and a shift to the right, following initial shift to the left, heralds recovery. Not all writers have agreed with him. All writers agree on one point, i. e., that it is often difficult to group this or that nucleus into its proper class. If one, however, selects first with the low power of the microscope, suitable, thin, evenly spread, and well stained areas of the film, and then carefully focuses each nucleus with the oil immersion, the classification will, after some experience, be as easy as the differential blood count.

Of course cells having distinctly separate nuclei are readily placed into their respective groups, but when the nucleus is much indented or several loops are present, judgment is necessary. In a general way nuclei connected by a thin, usually pale staining isthmus are counted as separate nuclei. When the connecting link is broad, and focusing with the oil immersion reveals no paler staining or fine separation, the nucleus is considered as undivided. We

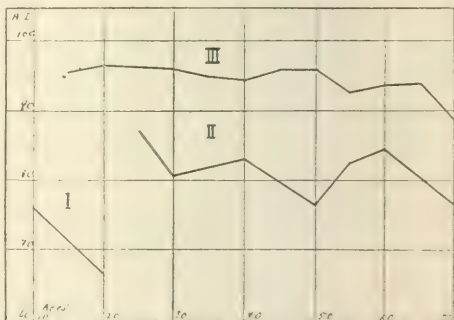


FIG.—Chart showing graphically the Arneth index in the three stages of tuberculosis.

would insist that careful focusing can detect in every case a variance in staining or show a fine but distinct separation. The results obtained show strikingly the shifting to the left as the disease advances, and the resistance of the patient is lowered. (See table.)

Even in incipient cases the number of the cells in Class I is increased to 22.5; in Stage II the increase reaches 44.9, while in the late stages of the disease 54.4 cells are present in Class I. With this increase in immature cells the more mature cells of classes III, IV, and V become less in number. Cells of Class V are entirely absent in Stage III of the disease. The index correspondingly increases from 71.7 of Stage I, to 85.0 in Stage II, to 95.5 in Stage III, with an average of eighty-three in the entire group of fifty cases. Such findings agree in general with the reports of Ringer (6), Ringer and Minor (7), Strickler and Solis-Cohen, Margaret Lewis, Burgess (8) and with those of others cited by them. The chart represents graphically our findings.

DOEHLE'S INCLUSION BODIES.

Doehle in 1911 found in cases of scarlet fever small, various shaped, deeply staining bodies within the cytoplasm of neutrophilic leucocytes. At first these "cell inclusions" were thought to be of the nature of chlamydozoa, and similar to the bodies described in smallpox, trachoma, rabies, and other diseases. It was soon found, however, that they occurred in many other of the acute infectious diseases, notably in erysipelas, and in pyogenic infections. Measles, German measles, whooping cough, and chickenpox only rarely show the bodies. Some writers have found them in pulmonary tuberculosis. The work of Wassermann and Kolle (9) under the chapter on Scarletina, and the papers of Kolmer (10), Macewan (11), and others give a complete survey of the literature.

In practically all our cases inclusion bodies were present. They are found usually at or near the periphery of the cell, stain deeper than the nucleus, are of rod, coccoid, and irregular shapes, and in size range from a very minute point to about one micron. I should digress too far if I discussed here the various theories advanced to explain their presence. It is our belief that they are nuclear fragments or extruded chromatin particles. It is often seen that a very small part of the nucleus is connected to the main nuclear body by a very slender thread, and one can easily imagine this thread to rupture and the particle to be set free. That they are found mainly near the periphery of the cell is probably due to the spreading out and flattening of the cell in the process of preparing the film. The bodies were more often found in immature than mature cells. More work needs to be done to determine their exact status and we give this merely as a preliminary note. They were usually more often present in advanced than in early cases of the disease.

As regards the age in relation to the various studies, the series of fifty cases proved too small and the variations in ages was too insignificant to draw any definite conclusions. In general it may be stated that neither age, sex, nor race had any decided bearing on the results obtained.

CONCLUSIONS.

1. In pulmonary tuberculosis decided alteration in the differential blood picture is found.
2. The more advanced the disease the higher is the percentage of polymorphonuclear neutrophils, and the lower the percentage of lymphocytes.
3. In cases tending to recovery the percentage of lymphocytes increases.
4. The Arneht's formula shows that in pulmonary tuberculosis a large number of immature leucocytes occur in the bloodstream.
5. The more advanced the disease the higher is the Arneht's index.
6. Arneht's index shows in a general way the progress of the disease.
7. Doehle's inclusion bodies are present in pulmonary tuberculosis, especially in advanced cases.

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THE PRESENT STATUS OF THE LOCAL APPLICATION OF RADIUM AND X RAYS.*

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Owing to some obscure quality in our being which we, for lack of a better term, call "human nature," we are very prone either to ban or bless, most unreservedly and whole heartedly, any new discovery or invention. It may be that desperation over our inadequacy to cope successfully with such urgent problems as malignant growths was the prime reason for the enthusiastic welcome extended to the use of the x ray. That the x ray was a valuable agent to the surgeon was soon demonstrated, but because it did not immediately prove itself a wonder worker, it was relegated to the background to make way for the spectacular introduction of radium.

First greeted as a modern mystery of miracles, now, after a few years, bearing the condemnation of a few of our best known surgeons, radium is becoming known at its true value. It is not a panacea, it is not a fake; it is, properly used, one of the greatest agents known to the medical profession, and one whose value is not lessened by recognizing its limitations. We have not yet, in any branch of medical science or surgical art, discovered any remedy or method that we can truthfully consider infallible, even in carefully selected cases. Over a decade has passed since the accidental discovery of the therapeutic value of radium—over ten years of active use; yet only in the last four years have really practical methods of treatment been developed. We have been hampered by the extreme scarcity and great expense; yet, now that such large quantities of carnotite ore have been discovered and utilized in our own country, we may hope for greater opportunities for the therapeutic application of radium.

It is essential that some of the properties of radium and x rays and methods of application be understood in order to demonstrate their value in the treatment of disease. The multitude of x ray equipments all over the country has to a certain

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degree worn away its novelty; while the comparative scarcity of radium clinics leaves much to the conjecture of even the average doctor. Radium is constantly giving off three grades of invisible rays, the alpha, beta, and gamma. The range of penetration of the alpha rays is very short, but its chemical action great. The beta ray is more penetrating; it easily influences living tissue several centimetres below the surface and possesses certain chemical properties. The gamma ray is similar to the hard x ray, but of shorter wave length and more powerful penetration. Therefore we have, in the therapeutic application of radium four factors to consider: amount of radium, screening, length of exposure, and distance between the radium and the area to be treated. A fifth factor might be mentioned—personal idiosyncrasy. In the use of the x rays we take into consideration the voltage and amperage of the current used instead of "quantity" as with radium, the other factors being the same.

So far as is definitely known the action of both radium and x rays is purely local. They have no effect, favorable or adverse, on metastases, nor will the treatment of a primary lesion effect a secondary growth of some other part of the body; the rays must be applied to the circumscribed area involved. Noted research workers, both at home and abroad, have proved and recorded these laws of radium: near the location of a tube of radium, a complete local destruction of all tissues is effected, if so desired, depending upon screening, length of exposure, etc.; at slightly increased distance there is more or less gradual destruction of malignant cells with increased growth of connective tissue; beyond this there is only partial destruction of cancer cells with less overgrowth of connective tissue; still further on there is a stimulating effect to the malignant cells; after which, the radium has no effect.

The changes produced in the tissues by x rays are similar to, but not identical with, those produced by radium, notwithstanding evidence to the contrary by a number of x ray and radium workers of more or less repute. Wickham and Degrais (1) say: "If a current of electric sparks be passed into and split up in a glass vacuum tube (Crook's tube), it is filled with special fluorescence, and certain rays, such as anode, cathode, and x rays are produced respectively analogous to, but not identical with, the alpha, beta, and gamma rays of radium." My own experience leads me to believe that there is a difference in the biological effects of the two agents and that a radium dermatitis or ulcer heals much more readily than one produced by x rays. Admitting that there is a close similarity between the effects of radium and x rays, there would still be clear cut indications for both their separate and conjoint use. This is especially true in gynecological work, and in the treatment of malignant conditions involving cavities. Generally speaking, where there is a large area to be treated, as in carcinoma or sarcoma of the breast or a large area of obstinate eczema, the x rays are to be desired; while in the treatment of uterine conditions, or in epitheliomata of the mucous surfaces radium is preferable because of its ease of application and because it can be brought into close proximity with the part to be

treated. It might be said in this connection that, in my opinion, their combined use is often better than either when used alone.

Undoubtedly as we gain in knowledge and experience we will understand more clearly the varying and equal properties of these two great agents. We will no longer look upon them as rivals, but as partners; we will no longer madly advocate one because we possess it, but will endeavor to utilize it to its greatest capacity, and when necessary call upon the other. As our technic improves we will doubtless discover that in a great many conditions one is as applicable as the other.

The x ray was first given great prominence in the treatment of epitheliomata, and although its first ardor of enthusiasm is passed, it is not only holding its own, but is constantly gaining ground in the treatment of malignant conditions of the cutaneous surface. In the hands of competent workers the relative percentage of cures is contesting strongly the percentage cured by radium. In several cases I have been able to obtain apparent cures with radium that had resisted treatment with x rays by some of the most capable röntgenologists of the South. Perhaps the experience of other men may prove the reverse. It may be pointed out here that after all it might have been the combined use that did the work successfully, and that had radium been used in the beginning it might have been necessary, or at least advantageous, to follow with x rays. In the treatment of naevi, small eczematous patches, celoids, etc., the consensus seems to favor radium as the agent of choice.

In the field of gynecology both radium and x rays are of inestimable value, and are going to be used more and more as our technic improves and results become known. In cancer of the breast unless hopelessly inoperable, a thorough dissection is always advisable, followed by thorough x ray or radium radiation. The x ray is preferable because of the possibility of irradiating a large area more homogeneously than if done with radium. The x rays are also preferable, in my opinion, in the treatment of large pelvic or abdominal growths for the same reason. For thirty years and more the surgical cure of cancer of the uterus has been the aim of some of the brightest minds of the profession; tireless efforts have been exerted to prevent, by surgical methods, the extension of the disease. The different methods of hysterectomy and in involvements of the cervix, amputation and cauterization, all have been tried with varying degrees of success, but even in carefully selected cases the number of fatalities has been appallingly large. Even with present improved methods, and in the hands of most skillful operators, more than half of the cases fail to respond. Admitting these things as true, surgery still has precedence in a large number of cases. The operative treatment of malignancies confined to the fundus is always advisable. When the involvement is general it is a mooted question as to whether operation is best; it is impossible to remove all of the diseased tissue; tissues that formerly clung to the central organs are forced to retract back upon their posterior anchor, the pelvic wall. The pressure upon the sacral nerves is thus intensified sometimes

to the extent of involving the lower limbs until the pain is almost unendurable; and, at the same time, the recurrent growth is rapidly increasing.

We have therefore adopted these rules: Operate in every approved operable case, as in former days. Use x rays or radium immediately afterward, but do not apply directly over the site of the incision. Use x rays or radium again about four to eight weeks later. Radiate all borderline cases preferably with radium in the uterus and x rays with a hard Coolidge tube through the abdominal wall. Use radium and x rays in all advanced inoperable cases, not with the hope of effecting a cure, except possibly in an extremely small percentage of cases, but, because, when not too far advanced, the growth may be retarded over a considerable period of time, nearly always alleviating the pain and checking the foul discharge. Also, it is sometimes possible to render an inoperable case operable.

In cases in which there is a large pelvic involvement, I favor highly a combination of radium and x rays: It is thus possible to crossfire the tissues completely and thereby obtain the combined beneficial results from the hard rays of radium and the hard rays from the Coolidge tube. Doubtless to a great many the use of both radium and x rays in the treatment of deep seated malignant conditions has been more or less a disappointment, however, there are other conditions, not of a malignant nature confronting the gynecologist in which our expectations have been more than realized and our optimism justified. I refer especially to uterine fibroids with or without menorrhagia or metrorrhagia; also, to menorrhagia and metrorrhagia due to remote and indefinite causes.

Kelly (2), in an article on The Radium Treatment of Uterine Fibroids, says: "Tumors of all kinds have been treated and the submucous and subperitoneal, and even the pedunculate, have seemed to respond as well as the interstitial." In reporting thirty-six cases he says: "The results in every case but one have been either the shrinkage of the tumor or its complete disappearance. . . . One of the most striking results," he adds, "is upon the menstrual function, where the radium can in all cases be depended upon to bring about complete amenorrhoea. . . . If care is taken to avoid giving too large a treatment, it is possible in some cases, especially with young women to avoid amenorrhoea." Lange (3), of Cincinnati, says: "The x ray treatment of menorrhagia and uterine fibroids by the production of the artificial menopause has been given a new impetus by the invention of the Coolidge tube. . . . If the proper technic is employed, the effect of the Coolidge tube radiation upon the ovaries is one of the most certain of medical phenomena. If sufficient radiation be absorbed by the ovaries they will cease to functionate in their fullest physiologic aspect and a cessation of menstruation will result."

It is thus seen that in the hands of competent men the results obtained, although produced by different agents, are practically parallel. However, I do not think the indications are by any means always the same, and that the method most available can always be substituted for the other. My own

opinion is that in selecting the method of treatment of uterine fibroids we should be governed by the type of tumor to be treated, and also should take into consideration other conditions that might be complicating factors. Kelly (4) says: "While radium has thus made a place for itself as the treatment of election, the best possible treatment in fibroid tumors, it does not take the place of operation in the exceptional case, for instance, where there are urgent pressure symptoms, or other complicating conditions, such as diseased appendix, gallbladder, etc."

The submucous varieties, by reason of their location and consequent composition, cause copious and weakening hemorrhages, and there is a resulting complication of the endometrium. For this reason radium is preferable to x rays in such cases, as it acts directly upon the endometrium thus causing a cessation of the bleeding by its effect upon the endometrium primarily and the ovaries secondarily. While the x rays perform the same phenomenon, it is by affecting the ovaries primarily and, possibly to a less degree, the endometrium. Therefore, the radium produced menopause is usually much less severe in its effects than that produced by x rays. In the interstitial and subserous varieties, I also believe that radium is more dependable than x rays for reasons already explained, while in the pedunculate the x rays are probably as efficient as radium. In both the subserous and pedunculate tumors I believe their combined use—radium in the uterus and x rays through the abdominal wall—is theoretically and practically correct.

Radium is of equal value in the treatment of obstinate cases of menorrhagia and metrorrhagia not associated with fibroid tumors. In a great many of these cases it is desirable to bring on the menopause as there is often danger of impending malignancy. This is invariably accomplished easily with but few of the pronounced symptoms that usually accompany the menopause. It is preferable to the x rays because it can be given with much less inconvenience and risk to the patient; also, as the endometrium is primarily affected and the ovaries secondarily, the nervous phenomena accompanying and following the menopause is much less noticeable. In the treatment of menorrhagia of young women the dosage is so easily regulated that the desired effect may be produced in many cases without bringing on a complete amenorrhoea, the functioning power of the ovaries not being entirely destroyed. I have treated a number of cases of uterine hemorrhage in which the patients had had repeated curettages without receiving permanent benefit; not one of these cases failed to yield to radium. One advantage not mentioned of radium over x rays in the treatment of pelvic conditions is that, by virtue of its method of application, there is no danger of dermatitis. It is known that the mucous membrane is far more tolerant of both x rays and radium than is the cutaneous surface. This is no little consideration in the treatment of these conditions. When both are used conjointly it is always possible to keep the dose of the x rays well within the bounds of safety.

I have made no attempt to discuss the various conditions more or less amenable to radium and x

rays, but to mention only some of those in which their value as therapeutic agents is firmly established and their supremacy acknowledged.

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SHOES, PHYSIOLOGICAL AND THERAPEUTIC.

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(Continued from page 437.)

Painful, weak feet with no deformity and slight perceptible loss of motion except in the toes are perplexing. Not a few patients showing no marked deformity or loss of motion and wearing fairly good shoes, complain bitterly of their feet. Many of these have thin feet, sensitive skin, and very little heel cushion, or they have small bones out of proportion to the weight of the body. We must be careful not to let the neurotic element be too prominent in our minds as a causative factor of these symptoms. There are many etiological factors which should be eliminated before concluding that we have a neurotic case. With hardly an exception there is muscular weakness, an absence of tone, whether the foot is thin or fleshy. The foot is painful, the patient is suffering. Is it a purely static condition, is there inherent weakness, bone anomaly or disease, toxic or infectious arthritis, metabolic disturbance or sequelæ? It may be a problem taxing the most skilful diagnostician.

These patients should be given physiological or therapeutic shoes as required, while searching for the causative factors; they should be directed to strengthen the entire muscular and nervous system by outdoor, brisk walking upon soft turf, when not contraindicated, combined with general and special exercises to strengthen the intrinsic muscles of the foot; a diet easily digested and low in proteins; in summer months an outdoor life, walking with bare feet in sand, or mud, with the head protected and no more clothing than is necessary. This will greatly benefit the nervous and muscular elements and correct many dietetic or metabolic conditions.

The first visible indication that the foot is suffering from undue restraint, inherent weakness, or disease is often marked by the unbalanced shoe (Fig. 15) when walking or standing. Upon examination we find a pronated foot, a splay foot, flaccid, painful or nonpainful foot, non painful perhaps because occupation has not required much of this particular foot, produced by footwear that inhibits all or nearly all the muscular movements of the foot. To restore balance in a pronated foot, or an abducted foot, a therapeutic shoe is needed. This foot rocks over on the inner tubercle of the calcaneus, much as when the "genteel" position is assumed. In a simple pronated foot the ankle seems especially prominent without falling of the internal longitudinal arch. This deformity takes place mostly in the subastragaloid joint. It is of

first importance to successful treatment to control the calcaneus (Fig. 7). To this end it is necessary to have a strong, snug counter to grasp the heel (Fig. 8). The physiological heel seat, deeper on the outer side where the lesser tubercle may rest, will help to control this deformity. The correction of pronation should be aided further by a moderately broad heel, at least as wide as the wearer's real heel, not the width of the squashed out, fleshy portion of the heel. Flare or extend the inner side one eighth inch or more.

As pointed out in a previous paper, most machine made shoes have the heel flared on the outer side



FIG. 15.—A well placed heel seat device to assist in straightening the foot and relaxing the lumbar. Note that the great toe is pushed up against the leather as far as it will go.

and cut under on the inner side. This fault should be corrected by all means. The inner side elevation should be built from one eighth to three eighths inch higher than the outer elevation, giving sufficient cant to overcorrect and adduct the calcaneus and to prevent the bulging of the internal malleolus. The inner corner of the heel may be moved forward one eighth to three eighths inch, the breast making a diagonal or sinuous line across the shank after the manner of the modified Thomas heel; or the breast may be moved forward in total on the shank and made one or more lifts higher than the back elevation of the heel, materially stabilizing the heel

seat. This modification will be especially useful in the more advanced stages of weakness or deformity. The heel of the shoe may be made of rubber, or the outer half of live rubber which when receiving the weight will cant the heel in adduction. In all other respects the therapeutic shoe for the pronated foot should conform to the physiological shoe.

A prescription for a shoe for a painful or deformed foot should be as definite as a prescription

ing the heel straight down from the rand. The breast one lift higher than the posterior elevation makes the heel seat more secure and elevates the arch of the shoe when weighted by the foot. The heel seat is one eighth inch lower on outer side to receive the lesser tubercle of the calcaneus. The sole is one eighth inch inner side elevation more than outer side.

The control of the os calcis will be most difficult when modifying the ordinary shoe, because the



FIG. 13.—Here the left foot has become much more deformed than the right. The right foot in the shoe is getting a good start.

to a druggist. To illustrate, the following example is submitted:

Miss M. S., 6000 Riverside Drive.

R Oxford ties. Russet brown calf. Walking shoes. Snug, strong counter; snug waist; broad toe, pointed tip.

Heel, $\frac{5}{8}$ - $\frac{1}{2}$; rubber; nonslip; full pitch; flaring inner side $\frac{1}{8}$; breast, one lift higher.

Heel seat $\frac{1}{8}$ lower on outer side. Shank narrow, flexible.

Sole strong, flexible; $\frac{1}{8}$ inner side elevation.

A snug, strong counter is ordered to hold the calcaneus; a snug waist prevents the foot sliding forward. A broad toe gives plenty of toe room. Straight inner vamp line to the end of great toe is understood and toe points beyond the end of great toe. The heel is to be five eighths inch inner side, one half inch outer side elevation or thickness. Full pitch means sloped forward much as a French heel; the flaring inner side, one eighth inch, widens the heel to the inner forward corner after carry-

ing the heel straight down from the rand. The breast one lift higher than the posterior elevation makes the heel seat more secure and elevates the arch of the shoe when weighted by the foot. The heel seat is one eighth inch lower on outer side to receive the lesser tubercle of the calcaneus. The sole is one eighth inch inner side elevation more than outer side.

The control of the os calcis will be most difficult when modifying the ordinary shoe, because the

loose heel counter (Figs. 4 and 6) and flat heel seat afford no grasp to hold the posterior foot. For want of something better, a slip in counter may be worn to fill the space.

In a more advanced stage of weakness we find the flat or valgus foot, more or less restricted in the excursions of adduction, extension and flexion, painful or nonpainful, but crippling when walking or running is necessary. A valgus foot is angulated in its longitudinal axis at the so called mediotarsal joint, with prominence of the navicular process of the scaphoid, and is nearly always associated with the extreme pronation of the heel and more or less flattening of the internal longitudinal arch. This is a difficult condition to correct with the shoe alone, and should be assisted by vigorous manipulation to correct deformity, and by strapping or plaster of Paris. When the foot is flat, or of valgus tendency, a strong, short, rigid shank will be necessary to control the stress and strain, the impulse

tending to deform the shoe imparted by the mechanically impaired foot. The strong, unyielding shank and generally strong shoe with more exaggerated cant in heel and sole will mark the difference between this shoe and the shoe for the unbalanced, flaccid foot.

The objection to the sole wedge is the production of corns and bunions on the little toe. This is overcome largely by a shoe adhering to Meyer's line, a low heel, elevated breast, and plenty of room

zinc oxide plaster or placed in plaster of Paris in correction. In order to do this with ease and with comparatively slight pain to your patient it is necessary to relax the muscular spasm and resistance that the patient will unconsciously exert against you. To this end you should have the confidence of your patient. Grasp the foot firmly (3) and direct your patient to move, or "wiggle," the great toe and continue to do so. If he will move the great toe frequently you can correct and make



FIG. 14. Same feet in better shoes with mechanical device but badly anchored. Shoes too long and broad in the waist.

over the distal end of the fifth metatarsal. If your patient's foot is broken down, flat, and stiff and he will not submit to correction, or if he has a great hamlike foot and no disposition to cultivate muscular development, you would better give him a plate or a rigid shank with extended inner heel prop under an elongated heel counter. This treatment will seldom, if ever, restore normal function. It is a poor treatment for any condition but the most hopeless, and is equivalent to giving up the fight for restoration.

The painful, rigid, static foot may have slight deformity or be remarkably fat or in valgus deformity. When of recent origin it may be corrected easily and made mobile and then strapped with

mobile the recently rigid foot. When of long standing this rigid foot, with the patient under anesthetic, may resist any but the most skilful effort. This rigid foot is often closely related to and frequently associated with arthritic conditions which may be most apparent in the feet. When considering the etiological factors of any grade or degree of painful feet we should keep in mind the many things that may cause this badly abused extremity to be painful. To the writer's mind these feet have been divorced too frequently from medicine. With one surgeon the mechanical problem only is in sight—he braces; while the physician is too prone to lump all into that one word "rheumatism"—he medicates.

In this problem of etiology the following points are to be considered: 1, the infectious arthritis produced by bacterial invasion, as exemplified in the action of the *Spirochaeta pallida*, the gonococcus, and the various streptococci and staphylococci (4); 2, toxic arthritis due to protein of bacterial foci, as exemplified in the dental granuloma by action of the *Streptococcus viridans*, the infected tonsil, the accessory sinuses, etc.; 3, the arthritis of so called metabolic disturbances or their sequelae—faulty elimination of nonprotein nitrogen compounds, the purins, especially uric acid (5), as in latent or masked gout; 4, arthritis due to putrefactive poisoning, especially the action of amines which experimentation shows to increase blood pressure, and which we have reason to believe is the cause of arteriosclerosis, which complicates painful feet; 5, the diabetic often has painful feet; 6, the nephritic is notably so afflicted. These infections and morbid states are at bottom responsible for many obscure, unaccountable twinges, cramps, tender flesh, and sore bones which may be the first signs of degenerative processes. These diseases are intractable except when discovered early by the skilled diagnostician.

The distorted joints of the feet early manifest pain or discomfort. These are the conditions which we are constantly finding as we go up the scale of age, good living, and the strenuous life of our large cities, conditions not curable with foot plates alone. It is obvious that these patients should be given a comfortable, physiological, or therapeutic shoe, as indicated, but we must do more than this. The etiological factor or factors must be ascertained and their influence eliminated as far as medical assistance can go.

The so called "trench foot," which is causing so much suffering at the front, is largely due to foot-wear which prevents circulation and muscular action, especially of the toes. Authelain says: "The boot should be wide and sufficiently long so that the toes can be moved in any direction, just as if the foot was naked" (6). Conditions less prominent than those mentioned, though influenced by bad footwear, are: the inflamed bursa, as achillodynia; the inflamed tendon sheath, or tendo synovitis; the tender sesamoids; the strained muscle or ligament, as strain or sprain of the athlete; the slipping, snapping tendon of the flaccid, lax, or pronated foot; the painful, nondeforming clubfoot of Schaffer in various degrees of deformity.

This much abused extremity may suffer from benign or malignant growths, bone anomalies, exostoses, Köhler's disease, or tuberculosis of the bones and joints which in its incipency is so liable to be dismissed as painful feet, falling arch, metatarsalgia, or sprained ankle. Bear in mind also the influence of shoes in perpetuating that loathsome condition of bromohyperhidrosis of the feet; and last, though not least, one who treats feet should not forget to recognize early the all too frequent and painful condition of thromboangiitis obliterans. It is hardly necessary to say that various conditions, deformities, and diseases may exist in numberless combinations.

No mention has been made of the many and

varied deformities due to paralysis, fractures, or the apparent congenital deformities, mild cases of which could be controlled by the modified or custom made shoe. It is only necessary to name these infirmities to realize the necessity for a thorough knowledge of medicine, anatomy, pathology, and mechanics as applied to the foot, which may be obtained only after time and study, with facilities for extensive clinical experience in treating foot conditions. Children with weak feet should be given a shoe with a strong, snug counter, not elongated, which will grasp the heel, a neat snug arch and broad toe space with sufficient elevation under the inner side of the sole, and spring heel, to prevent the continual body thrust stretching the ligaments of the long arch. So long as the leather covering the scaphoid is pushed outward, the elevation on the inner side is insufficient. It is presupposed that the child is given instruction in walking, attitudes of standing, and such exercises as may be comprehended, especially strengthening the intrinsic muscles of the foot. The ideal shoe for a child with normal feet is the sandal. Plates and foot props destroy the elastic tread, frequently press upon vessels, stretch the plantar fascia, and produce atrophy, weak muscles, and weak feet. When scientifically applied they do relieve pain and a tendency to deformity, as immediately after removing corrective plaster of Paris. They should be discarded as soon as their primary object is attained, as a constant wearing sacrifices mobility and strength.

In regard to the prescribing of foot plates and therapeutic shoes by shoe clerks, the medical profession has been exceedingly remiss as a guardian of public health. The uncalled for application of plates and modified shoes has been the cause of many aggravated weak feet conditions that will persist through life. The laxity on the part of the medical profession is due to the fact that the average physician is woefully lacking in the most elementary knowledge concerning the treatment of foot conditions. Most of them have made a very superficial study of orthopedics in general, and never having gone deeply enough into the subject have no idea of its ramifications and its relation to internal medicine. Almost every pain in the foot or discomfort produced by a foot working at a mechanical disadvantage is diagnosed as rheumatism, and the patient is given salicylates, or is sent to a shoe store or a bracedmaker for a foot plate. With just as much scientific attainment and medical

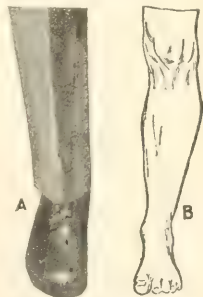


FIG. 12.—A, the trade's conception of a well fitting shoe and correct weight bearing position. A very good example of the appearance of the foot in a poorly balanced shoe. When trying on a shoe remember that a shoe that disturbs the balance, gives a sensation of turning the foot outward and prying the outer side of the foot upward, no matter how good the design, will compel your foot to work at a mechanical disadvantage. Such a shoe should be modified or discarded. B, a properly balanced foot (after Whitman).

acumen could the doctor send a trusting patient with heart disease to the druggist with a note directing that he be given a heart brace, the druggist to decide as to the dose, duration of treatment, and whether to administer digitalis, strychnine, or what not. Another physician will call up his orthopedic acquaintance and inquire the name of a shoemaker or the shoe that he recommends, and sends his suffering patient to be dosed by this skilled mechanic. The erudite few direct the skilled mechanic to select his most approved creation and cant the heel or sole or both by one eighth to one fourth inch, or apply a brace, or foot prop, which the doctor has designed and declares meets every condition to which the foot is heir. Another group of the profession considers the chiropodist fills the long felt want, and these men and women are making wonderful strides in their preparation and aspiration to be doctors of the foot, as though it were possible to treat intelligently a single part of the body.

These remarks are not made in a spirit of levity or of complaint, but as a warning to the self-sufficient that the medical profession as a whole is passing along, to men less generally and broadly prepared, the care of that part of the body which many of the best tacticians declare decides the battle or the campaign, a part so intimately related in function and pathology as to brook no separation in treatment.

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CALCULI IN THE URINARY BLADDER.

Report of an Unusual Case.

By ARNOLD PESKIND, M. D.,
Cleveland.

CASE.—Mrs. E., seventy-two years of age, the mother of five living children, arrived at the East Fifty-fifth Street Hospital August 4, 1917, suffering from complete retention of urine since June 24th, from which date the catheter had to be resorted to. She had undergone several operations on the uterus and its annexa, and these were totally removed about ten years ago. She had also suffered many attacks of gallstone colic, often accompanied by jaundice of variable intensity and duration. The last, a very severe attack, about a year ago, was accompanied by chills and fever, followed by jaundice lasting several weeks and only subsided when the softened stone ulcerated into the duodenum and was expelled through the bowels. For the past few years Mrs. E. had been suffering from myocarditis and bronchial asthma. There was also a hard round swelling in the right breast, involving its lower half, adherent to the skin, with nipple markedly retracted. It was somewhat nodular, but no glands were perceptibly involved. It was undoubtedly a slowly growing scirrhous carcinoma, not infrequently met with in practice, which seldom causes any serious metastasis. She was advised some time before to have the tumor removed, but this she flatly refused, as it did not cause her much inconvenience nor any pain. There with a slight dullness at the base of the left side of the thorax close to the spine, but neither auscultation nor x ray could clearly establish the cause for this rather increased dullness. The cystoscope revealed a practically normal mucosa in the interior of the bladder, except about the trigone, where there were signs of engorgement and a few flocculent shreds covering isolated inflamed spots. Two centimetres above the trigone, in a space apparently

deepened, were lodged many faceted calculi. One isolated, probably recently dislodged, stone was seen to the left of the trigone, imbedded deeply in the tissues and almost concealed by inflammatory exudate. The urethra was insensitive and was dilatable without any force to 40 F. Without anesthesia a narrow wire kidney stone forceps was introduced into the bladder and, with the aid of the left index finger in the vagina, eleven calculi were easily removed. This was deemed sufficient for the first attempt, the patient's general condition prohibiting further efforts. No reaction followed.

August 9th, in the same manner, without anesthesia, twenty stones were removed. There was no visible injury to the urethra. About three hours after the second removal of the calculi, a slight chill, followed by a rise of temperature to 102.4° F., caused me some apprehension, but all subsided in a few hours with no further trouble from this

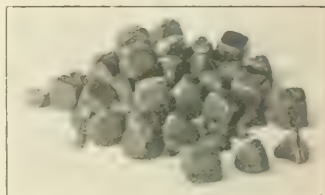


Fig. 1. Calculi removed from the urinary bladder, strongly resembling gallstones in shape and color.

source. Six days after the second attempt, August 15th, the last six calculi were removed. The cystoscope at this time discovered no more stones in the bladder, but disclosed the peculiar corrugations on the posterior wall of the bladder in which numerous cryptlike conformations had retained the shape of the calculi, which were imbedded in those crypts for probably many years. A striking characteristic of all these calculi was their strong resemblance to gallstones in shape and color, as the accompanying illustration shows. Upon section, each calculus consisted of an inner lighter substance, covered externally by a shell of dark brown appearance, and was composed of phosphates, urates, and oxalates.

The subsequent history was as follows: The paralysis of the bladder persisted, and the use of the catheter with daily irrigation of the bladder had to be continued. The growth of the breast, which had been dormant, seemingly at least, for so long a time, assumed after a few weeks more perceptible activity. The breast became somewhat more sensitive; new spots of proliferation became manifest; new nodules developed with a tendency to superficial ulceration in several spots. Progressive and rapid emaciation, with extreme exhaustion, rapidly supervened, undoubtedly due to cancerous cachexia, as the bladder showed scarcely any signs of sepsis, nor was there at any time fever to account for the systemic deterioration. The patient died November 6, 1917, about six or seven months after the first symptoms of serious urinary difficulty called for special attention.

During all these months there were no perceptible signs which could have been attributed to metastasis within the spinal cord. Outside of the bladder difficulty no sign of either motor or sensory disturbance could be discerned anywhere in the body. I often wondered and sought an answer as to the pathology in this case. Was the paralysis motor or sensory in origin or both? Was the complete anesthesia of the urethra alone sufficient to account for the retention of the urine? What part was played by the stones? What part by the cancer in the breast? I could find no answer to any question, and to this day I doubt whether a post mortem would have supplied any better information, though no opportunity was granted even to attempt this.

2414 EAST FIFTY-FIFTH STREET.

STATUS OF THE ABORTIONIST IN THE MODERN SOCIAL ORDER.

BY ROBERT H. MACNAIR, M. D.,
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If lamentable, it is a strong indication of the standing of the criminal abortionist in modern society today, when it is considered how quietly and gracefully his practice is ignored. A very recent case illustrates this fact. In one community of culture and much refinement a young woman died, unfortunately, as the result of an operation by one of these bungling crooks. Cornered, literally red handed, for it was stated that there had been much hemorrhage, the individual was apprehended by the officers of the law. Allowed to furnish bail, he proceeded to a local bank and drew out just \$5,000, the amount of his bond, even though it was well known that the man had no regular practice nor other means of earning the thousands. When finally, the case came up for trial, after the usual long delay, a sentence of five and a half years was imposed upon the crooked "doctor," but today he is apparently as free as the little bluebirds that chirp their signals for the migratory flight south. When seen hurrying along the principal streets of a fair sized town the inhabitants who know the individual—no effort is made to "cover up"—wonder how it is that a criminal who has been placed under a five year prison sentence is allowed to roam at large in accordance with his own sweet will. The reason, it would seem, is quite simple, expressed in two words—public sentiment. The history of that particularly cultured community has indicated that abortionists were numerous, their nefarious practice was kept well under cover, and they conducted a thriving business. The process reminds one, amusingly, of the teaching of the old colored woman to her son, "Torm, min' out now, hit ain't no harm ter take whut yer want, but don't yer niver let dem white folks catch yeh at hit." Just so long as the criminal operations are successfully pulled off, well under cover, just so long will society wink and pass on. However, when some one of these crooked operators becomes careless with catheter, tampon, or curette and disastrous results follow, society must arise to the occasion, as a matter of form, of course, make some little to do and then take up the old winking habit again. Some very frank talk was being indulged in with a lady patient on the subject and in reply to a true and decidedly pointed statement, the excuse was offered, "Well, it is quite necessary nowadays to be in the swim," It is quite true, as the old woman contended, "Times air changed mightily," but, it would seem, there are some very serious questions now up for a progressive, well organized society to settle.

Within the past few months a woman patient was brought in by a man, married but not to the patient. The same direful tale was heard with little or no sympathy. The couple had visited a regular criminal abortionist and were frightened away by his exorbitant demand for money. The man and his victim were plainly advised that absolutely nothing would be done and, at the same time, it was strongly urged that the woman be sent off to a cer-

tain, well conducted home for unfortunate women, there the matter would be allowed to terminate in Nature's way. Fortunately, the case of the criminal abortionist in court was fresh and could be used as a persuasion stick. At about the sixth month of pregnancy the couple departed for the maternity hospital in a distant city. All seemed to go well until the patient, whether from depression at the thought of losing her graceful figure or the separation from her lover, became so desperately discouraged and homesick that the unfortunate, responsible man was besieged with letters, imploring him to bring her home. "I am quite willing to face the music, it is not such an uncommon occurrence but that I have lots of company," etc.

Meanwhile, however, other letters were being posted to another woman, one who had large experience with just such cases, a woman of great tact and good judgment. The letters she received of suggestion and counsel strongly urged that she use every possible means to make that deluded patient keep still. There was absolutely no deception used in getting the patient into the maternity hospital; the letters of the superintendent were read to the patient and she seemed most willing to place herself under the care of such a nice place. From last reports the patient has, thus far, been made to "keep still."

It would seem that we are advertising volubly our much vaunted progressive, Christian civilization and our great achievements along very many lines. We seem to be approaching a world wide democracy, but until we look more carefully to correcting the principles that must serve as the foundation to this great social order of progressive democracy, etc., there is serious danger of history repeating itself in the social conditions of ancient Rome. When it was stated by ancient Rome that the Huns and the Vandals came from without to pillage and destroy, in reality, and it was afterward found out, that the Huns and the Vandals were within the walls of the Eternal City.

423 MAIN STREET.

Vitality of the B Paratyphoid Bacillus in Contaminated Edible Shellfish.—G. Daumézou (*Bulletin médical*, December 29, 1917) sought to ascertain to what extent the B paratyphoid organism could withstand antagonistic organisms, especially those of the proteus group, under conditions such as those in which edible shell fish are customarily kept, viz., in pure sea water or in brackish waters. The cultural conditions were such, water being taken from the pallaeal cavities of the shellfish themselves and a sufficiently anaerobic state established, as to reproduce as closely as possible the conditions under which the organisms naturally pullulate. A tendency toward disappearance of the paratyphoid bacillus under the influence of the proteus organism was observed, but this disappearance took too long a time to be of practical advantage. The antagonism of the two organisms was not appreciably changed upon substitution of artificial for natural sea water, provided sufficient assimilable organic matter was present in the artificial sea water.

DRUG ADDICTION.

Recommendations of the Public Health Committee of the New York Academy of Medicine, and of the New York Psychiatric Society.

Dr. Charles L. Dana, chairman of the Public Health Committee of the New York Academy of Medicine, transmits to the editor of the NEW YORK MEDICAL JOURNAL a set of recommendations prepared jointly by that committee and by the New York Psychiatric Society, with reference to the drug addiction problem, which represents a great deal of careful thought. The committee desires to give this matter as wide publicity as possible, and we, therefore, take pleasure in presenting the recommendations in full. The members of the executive committee of the Public Health Committee are: Dr. Charles L. Dana, Dr. Nathan E. Brill, Dr. Frederick E. Sondern, Dr. W. Gilman Thompson, Dr. Philip Van Ingen, Dr. James Alexander Miller, Dr. Karl M. Vogel, Dr. Herbert B. Wilcox, and Dr. E. H. Lewinski-Corwin. The recommendations read as follows:

1. *We recommend* that the Federal Government take such measures as are feasible to abolish the manufacture of heroin altogether.

2. *We recommend* that the Federal Government be urged to adopt such legislative measures as will control and regulate the sale and distribution of opium and its derivatives and of cocaine, from the time of its manufacture to the time of its final distribution; also, that it take measures with regard to preventing the importation of these drugs except under proper conditions.

3. *We recommend* that the Federal Government do not, at present, extend its activities to the control of all habit forming drugs, but that the control of special drugs be taken up as occasion seems to demand. Experience in New York City and the East shows that there is no great prevalence of drug habit aside from that of opium and its derivatives.

4. *We recommend* that a thorough study be made of the extent and causes of drug addiction, such studies, for example, as will give information as to the age, sex, occupation and environment, mental and physical condition of victims of the drug habit, and as to how their habit was formed.

With regard to the cause and frequency of the habit, we can make only provisional statements. So far as our knowledge goes, the drug habits formed as the result of long and painful sickness, as the result of painful surgical operations, and as the result of mental causes like sorrow, depression, and apprehensive states, constitute at present, as in the past, a negligible proportion of the total. The habit has largely been formed in recent years by association and imitation by boys and young men and women who are often quite ignorant of the dangers of the habit. Examination of a long series of addicts at Bellevue Hospital shows that about four per cent. formed the habit through the advice and prescription of unscrupulous physicians who utilize what is known as the reduction treatment as a cover for their reprehensible practice. So far as the number of addicts is concerned, we find some estimates by Martin T. Wilbert, U. S. Public Health Service Bulletin No. 321, to the effect that there are not over 175,000 addicts in the country. Estimates made by Doctor Kirby, based on available sources of information, show that there would be, perhaps 7,000 to 8,000 in Greater New York. These estimates of Doctor Kirby's are based on the statistics of Bellevue, Metropolitan and Kings County Hospitals, and on the reports from the hospitals of the Department of Correction. There is an impression among some that the drug addiction is enormously prevalent and is rapidly growing and becoming a serious menace to society. It is extremely important to find out the truth as to this. The Public Health Service states that about four million grains less of opium were imported into the United States in 1915

than in 1914, and about five million less than in 1913, but this may be due to the war.

5. *We recommend* that there be psychological and psychiatric tests made of a long and definite series of addicts. No serious and comprehensive study of these problems has yet been made so far as we can find. Such information upon the subject of drug addiction can be gathered best through the agency of paid experts who will visit hospitals and courts and prisons and reformatories, and who will interview such physicians and judges as are experienced in these matters.

6. *We recognize* that the Surgeon Generals of the Army and Navy have taken a special interest in the subject of drug addiction. We recommend that if it have not already been done, some special study be made of the condition of drug addiction in the Army and Navy and special care be taken to discover the existence of addiction in recruits. We understand that the Surgeon Generals of the Army and Navy are already making special provision for the care and treatment of drug addicts.

7. *We recommend* that an attempt be made to plan some means of education of young men and women as to the dangers of habit forming drugs. We advise against the use of "movies" or of any sensational methods.

9. *We recommend* that more attention and publicity be given to the facts which appear to have been established by long experience at Bellevue Hospital and elsewhere. The experience at Bellevue Hospital, after testing with many cures, shows that the drug can be withdrawn from the victim without any special cure being used and it seems to be established that withdrawal can almost always be done safely and surely under ordinary hospital conditions where there is competent nursing and control.

10. *We recommend* very strongly that treatment for drug addiction should be given only to patients in properly organized hospitals or under institutional conditions, for it is the experience and conviction of all that drug addiction can be relieved and cured best in this way.

11. *We recommend* that the State do not at present undertake the cure of drug addiction, because the treatment and the subsequent plan of cooperative contact required for success is long, expensive, and difficult unless carried out in the local community itself, and the State is not now equipped to undertake such work.

We recommend that in preference to this, at the present time the State do what it can to prevent the development of new cases and encourage provision for the relief of present sufferers.

12. *We recommend*, for the relief of present sufferers and perhaps at times for radical treatment, the use of psychopathic hospitals or pavilions and that special provisions be furnished in general hospitals throughout the State to care, under proper control, for those who ask for a withdrawal treatment. This, we think, is what is due the patient who by law is deprived of the drug.

13. *We recommend*, finally, pending action by the Federal Government for the better control of habit forming drugs, that the State of New York pass some law which will control the matter of drug addiction and the use of drugs by physicians in a better, more efficient, and more practical way than does the present law. We leave the definite solution of this as a separate problem in technical legislation. The plan at present under consideration is to simplify the present law and make it mainly supplementary to the present Federal law, and to issue licenses to those physicians who treat drug addicts.

[The recommendation in Clause 4 is specially desirable, for there is a marked increase in the taking of drugs for "nervous" conditions among young employees in factory, store, and office. This often arises from the fact that a second or third visit to the doctor cannot be afforded, and a drug prescribed for temporary relief is often taken for months until a reliance on it is established, the plea being that "My doctor prescribed it." But, back of the drug habit among employees lie the tremendous problems of a living wage, decent homes, holidays, and knowledge of things hygienic.—Ed.]

Medicine and Surgery in the Army and Navy

THE CLINICAL TYPES OF LOCALIZED OR PARTIAL TETANUS.

By CHARLES GREENE CUMSTON, M. D.,

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Privat Dozent, University of Geneva; Fellow of the Royal Society of Medicine of London; Honorary Member of the Surgical Society of Belgium; Member of the Surgical Society of Switzerland, etc.

I shall describe at some length the varieties of localized partial tetanus, because it is one of the new findings of this war and the surgeon going to the front should be familiar with the aspects of the process.

Experimentally, tetanus always begins by contractures in the first place limited to the muscles of the region inoculated and if the dose of toxin injected is sufficient, the contractures at length involve all the muscles of the body. In man, on the contrary, tetanus, although almost always beginning in the constrictor muscles of the jaw, does not appear to manifest any predilection for the muscles of the area infected. On the contrary, the contractures often appear and sometimes become localized in a region opposite to that of the wound, and these contractures are not long in becoming generalized to about all of the muscles of life of relation.

It is only in some exceptional cases that tetanus becomes localized in man to the muscles of a given region, thus giving rise to partial localized tetanus. Instances of this kind were formerly exceptional but in the surgery of warfare they have become relatively more frequent and this is not simply due to a general increase of cases of tetanus. The acute forms of tetanus were only too common in the early months of the war, while at present the partial localized types are more commonly met with, due probably to an attenuation of the virulence of the toxin produced by the prophylactic serum given to every wounded man as soon as he comes to a post.

Splanchnic tetanus is unquestionably a partial tetanus because death usually takes place before the contractures have become generalized. It consists in a contracture of all the muscles of deglutition and respiration, followed by paroxysms of suffocation with glottic spasm produced upon the slightest tentative at swallowing. The paroxysms of dyspnea are subintractant, the contracted respiratory muscles only permitting an insufficient hematosis. There may also be trismus and stiffness of the neck muscles. This form of tetanus follows visceral inoculation—intestine, rectum, vagina, uterus—and is unquestionably the most serious form of partial tetanus because death almost always ensues within forty-eight hours from asphyxia or syncope.

The other forms of partial localized tetanus differ very considerably from the splanchnic variety of the process, not merely in the localizations but likewise in the following ways: The process is invariably long, entering into the well known class of chronic tetanus, while splanchnic tetanus is an acute process of the purest kind. The incubation is generally very long in partial tetanus and in most cases the process develops in the infected region. This, however, must not be accepted as an absolute rule

because cases have been observed in which the initial wound occurred in a limb, while the tetanus developed and remained localized to the muscles of the head and neck, as if the toxin had become fixed in the cervical portion of the cord from the very beginning.

Localized cephalic tetanus may be conveniently divided into four varieties, the first being the non-paralytic type. This is characterized by trismus and occasionally by some disturbance of deglutition. There is also stiffness of the neck muscles and a mild degree of contracture of the facial muscles, producing the sardonic expression met with in generalized tetanus. The second variety of cephalic tetanus is that with facial paralysis. The infecting wound is always seated on the face, most commonly in the orbitonasal region. There is trismus and dysphagia is frequent and often so painful that it assumes a hydrophobic type. The most prominent and paradoxical character of this form is the hemifacial paralysis on the same side as the wound, producing an asymmetry comparable to that of unilateral facial paralysis. In some cases the paralysis was limited to the territory of the upper or lower branches of the facial nerve, thus realizing the type of upper or lower facial paralysis. As in all cases of partial tetanus the evolution is slow and death which occurs in about sixty per cent. of the cases, results from bulbar paralysis. The third and fourth varieties of cephalic tetanus are that with paralysis of the motor nerves of the eye and that with paralysis of the hypoglossus. The former type most commonly coexists with a facial paralysis. All the nerves of the eye may be more or less involved, but the common oculomotor is more frequently involved than the others. There is more or less marked strabismus and ptosis.

In the variety with paralysis of the hypoglossus, the symptoms are readily apparent from the localization and simulate a glossolabiolaryngeal paralysis which is always accompanied by trismus and rigidity of the neck muscles.

The unilateral form of tetanus is characterized by contractures involving one side of the body which progressively invade the muscles on the opposite side. However, in some instances the contractures remain limited to one side of the body for a long time, thus realizing a localized partial tetanus.

Partial tetanus of the limbs may involve either the upper or lower extremities, but whatever their modality, these types of tetanus offer a certain number of characters in common. After the usual long incubation, the process undergoes the following evolution in three phases: the first, or pretetanic, phase is usually short, lasting from one to three days, and makes itself evident by violent pain in the members which are to be involved, without muscular rigidity. The second phase is the tetanic and manifests itself by contractures with paroxysms of pain upon the slightest movement. The muscles are tense to their utmost limit, rigid, and in hyperextension. In the case of the arm there is flexion; in the lower limb, extension. Other than these symp-

toms the condition remains relatively good; there is no rise in temperature but often a mild degree of trismus and rigidity of the neck will be detected if looked for. This phase lasts for a variable length of time, but rarely more than a fortnight, after which the patient enters into the posttetanic phase.

The posttetanic phase, when fully developed, is represented by a permanent contracture of the limbs involved but without any paroxysms of pain. The limb involved is immobilized in a fixed attitude and this rigidity, which lasts for a month or even more, is one of the special characters of this form of tetanus. On account of its long duration, this phase often results in deformities, such as muscular retraction and atrophy, and vasomotor disturbances, all of which require a long convalescence.

Now that the evolution of tetanus of the limbs has been outlined, it may be well to consider briefly the different clinical forms of this variety of tetanus, which may for convenience be divided into paraplegic tetanus of the upper limbs, paraplegic tetanus of the lower limbs, and the monoplegic variety. In paraplegic tetanus of the upper limbs, both members are involved. The contracted limbs are in close contact with the thorax, the forearm flexed on the arm, and the hand on the wrist. Contracture in extension has never been reported, so far as I am aware. Painful spasms occur causing exaggeration of the contracture. This variety is very uncommon, but paraplegic tetanus of the lower limbs is somewhat more common. In this form the lower limbs are in forced extension and it is impossible to obtain the slightest flexion. The muscles of the calves are hard and rigid while the tendo achillis, absolutely tense, places the foot in equinus. The leg is in forced extension on the thigh and the latter on the pelvis. There is usually a mild degree of contracture of the abdominal muscles. Trismus and stiffness of the neck are usually absent. Monoplegic tetanus offers the maximum of localization of the tetanic toxin. It may involve any one of the limbs. In all the cases the symptoms noted have been the same as in the paraplegic types described.

METHODS OF PREVENTION AND CONTROL OF DISEASE IN WAR INDUSTRIES.*

By JOSEPH W. SCHERESCHEWSKY, M. D.,
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Doctor Schereschewsky pointed out that the success of America in the present war depended in large measure on the highest efficiency in industry in the manufacture of war materials and on the greatest facilities for transporting them. To this end the effective organization of industry was fundamental so that maximum, continuous production could be extended over the entire period of the war. On the energy and therefore the good health of the workers depended the output, so it was selfevident that every means should be applied to secure continuous good health.

This could only be accomplished by measures of prevention of occupational diseases and poisons, regulations for and supervision of sanitary conditions, and medical care and supervision of the workers. The conditions surrounding war industries necessarily involved health hazards such as toxic poisons, high degrees of heat and humidity, and inadequate ventilation and illumination. The workers were exposed to dust and fumes and to noise and vibration. In addition there was muscular strain causing overfatigue. Housing conditions were also an important consideration.

One of the advantages this country had in entering the war after the other allies was the opportunity of profiting by their mistakes, not the least of these having been in the direction of industry. There were many wise regulations for the safeguarding of industrial workers in Great Britain at the beginning of the war, yet in the necessity for speeding up the production adequate supervision was not enforced and overfatigue, due to long hours and overtime, physical incapacity, and inadequate sanitary provisions, defeated in themselves the desire for maximum output. Therefore, adequate supervision of the industries from the health standpoint was instituted and skilled workers who had been sent to the front were recalled and conditions had immediately improved. The large number of industries in this country manufacturing explosives and munitions, textile and metallurgical materials, chemicals, rubber, leather, ships, etc., would undoubtedly be greatly enlarged, new plants springing up everywhere. Many of those undertaking production in Government contracts would have insufficient experience with the manufacture of their products and the health hazards involved. It therefore seemed imperative that the Federal Government should exercise control and supervision of the health of the industrial workers.

Health hazard existed in industries other than those manufacturing munitions and explosives. For instance, the solvent used on the wing fabrics of aeroplanes was often highly poisonous. Lead poison threatened in the nosing of shells, manufacture of shrapnel bullets, and the sealing of food cans for the army. Poisonous compounds were used in the rubber industry. The metallurgical trades exposed the workers to great physical strain, dust and fumes, extremes of heat and humidity, and eye-strain through imperfect illumination. In addition there were the deteriorating effects of overfatigue, a condition to which especial study had been devoted by the Health of Munition Workers' Committee in England and by the Public Health Service of the United States. Without impairing efficiency, simple effective measures could reduce these hazards to a minimum. The coordinated and effective action of all the public health agencies in the country should enlist in the conservation of the health of all industrial workers. As Congress had conferred authority on the United States Public Health Service to investigate insanitary conditions and as it had facilities for studying and advising in matters pertaining to public health, it seemed most logical to consider the service as the proper medium through which the Federal Government might unite and co-

* Abstract of a paper read before a meeting of the New York Academy of Medicine, March 7, 1918, at a symposium on The Prevention of Disease in War Industries.

ordinate the health agencies of the country in the effort to protect the health of the industrial workers. At present there was lack of standards of industrial hygiene, lack of uniformity in health organizations, and great differences in facilities for disease prevention in the different States, so that some form of concerted action in establishing adequate supervision of the health in war industries was actually a necessity, and it should embrace the following points: 1, the creation of minimum standards of industrial hygiene in relation to factory sanitation and means of prevention of occupational diseases and poisonings; 2, sanitary supervision of premises, buildings, and processes of industrial plants engaged in supplying war material to the Federal Government; 3, medical supervision of workers in industrial plants, including examination and therapy for minor ailments; 4, measures to avoid overfatigue; 5, an educational campaign in personal hygiene, so as to secure the cooperation of the workers; 6, the carrying on of collateral studies with a view to improving and increasing efficiency and safeguarding the health of the workers; 7, community sanitation and housing facilities of the workers; 8, measures to remove deteriorating mental states.

The program as outlined could be realized by active cooperation of State and local health boards and State departments of labor with the Federal Government through the Public Health Service acting as a unifying and coordinating agency, supplementing and stimulating but not supplanting State and local activities. The passage of the measure at present pending in Congress, known as Joint Senate Resolution 63, empowering the Public Health Service to cooperate with and make effective the health agencies of the United States would readily bring about this very desirable state of affairs.

The public health situation at present was critical. The present state of affairs in Europe, the submarine activities, the urgent desire of every one that the country use every resource of man, power, and materials in the victorious prosecution of the war, demanded that no stone be left unturned to secure this glorious result, and an essential factor in the effort was the adequate protection of the health of the workers.

MEDICAL COLLEGE TRAINING FOR NAVY HOSPITAL CORPSMEN.

By WILLARD CONNELLY.

Minneapolis,
Chief Yeoman, U. S. N. R. F.

War demands broad jumps. Sailors are attending college, and professors have waived all entrance requirements to their classes except the uniform of the United States Navy. The uniform, however, signifies more preparation than the civilian imagines. Hence the success to be noted. Harvard has her naval radio school, Columbia her sailor mechanical engineers, and now the University of Minnesota is teaching bluejacket medical assistants. What colleges next will fall in line? Physicians may doubt that a three months' course of study can fit anybody to take care of the sick. It sounds like the

advertisement of a medical correspondence school, but America's watchword, speed, in winning the war, allots no further time. Naval hospital apprentices can be trained in a first rate medical college quickly because of its equipment.

Ensign Colby Dodge, of the United States Naval Training Detachment at Minneapolis, brought the "medical bluejackets" to the Northwest as the result of one of his official trips to Washington, when the subject was broached by Surgeon General W. C. Braisted. Ensign Dodge communicated with Dean Elias P. Lyon of the university medical school; in twenty-four hours arrangements were made for the reception of 100 students. At the beginning of February these men were ready for active sea duty on hospital ships or with the fleets somewhere off the Atlantic coast. They were replaced immediately by another 100. To the everlasting credit of Dean Lyon stands the schedule, extremely concentrated and practical, which he mapped out for the men. In this he was ably aided by Assistant Surgeon G. M. Olson, U. S. N., of the Minneapolis naval detachment and member of the medical school faculty. Commander Warren J. Terhune, U. S. N., has since been appointed commandant, Ensign Dodge remaining an executive officer.

Briefly, the bluejackets attend lectures or perform laboratory experiments in the mornings, then proceed in the afternoons to clinics or to the university hospital, there to apply their freshly gained knowledge. Nothing unusual appears in this method, but the exquisite dovetailing of the classes, tending to reinforce parallel phases of different subjects, invites comment. When I say it is the aim of the sailors' curriculum to instil medical discernment seriatim, I mean a lecture in hygiene on precautions for ventilation, for instance, is followed by a demonstration in anatomy on the respiratory apparatus, then by bacteriological inspection of pneumococci and bacillus tuberculosis. If so much takes up one morning the practical nursing of the ensuing afternoon is given over to such correlated duties as application of hot and cold compresses, turpentine stupes, mustard footbaths, making and applying mustard plasters and flaxseed poultices, and filling and care of hot water bags and ice caps. So, the hospital apprentice learns about the lungs, and because of this astute reiteration he retains what he learns. Six hours daily makes a course of about 400 hours. In that time the apprentice qualifies for the rating of pharmacist's mate and he is a mighty good one, unsurpassed, in fact, in the navy today.

One hour a week Dr. John Hiebert gives lectures in minor surgery, lectures based on the Red Cross first aid handy book. Under the topic of shock and hemorrhage he discusses tourniquets, the main vessels to be compressed, subclavian and temporal hemorrhages, and electric and surgical shock. The talk on wounds and boils includes contusions, incisions, lacerations, perforations, and penetrating and fissured wounds. Their treatment he takes up under conditions both clean and infected, including nature's protection of tissues, the bacterial side, if streptococic, etc., and local and blood conditions. Burns come next, with a review of frostbites, freezing, alkali burns, and sunstroke. In this period considerable time is devoted to a discussion

of Dakin's solution and dichloramine-T, emphasizing the many advantages of the latter as brought out recently through its extensive use in the war zone. Another highly practical talk for the sailors

handling the injured follows, on back and by stretcher, with a demonstration of first aid splints and fractures. The course is concluded with the matter of common poisons and antidotes—carbolic



FIG. 1. Hospital corps of the U. S. Naval Training Detachment, Minneapolis, studying to be pharmacist's mates at the University of Minnesota. Naval hospital apprentices in the pharmaceutical

involves the conditions which call for artificial respiration—poisoning, asphyxiation, drowning, and a demonstration of both Schaefer and Sylvester methods. Note is taken of such contingencies as diabetic coma, and the care to be taken not to confuse apoplexy with alcoholism. Carrying and

acid, opium, strychnine, sulphuric acid, bichloride—in so far as the effect of each is indicated internally or externally, then with a talk on general and local anesthetics and the newest observations on shell shock.

Dr. Arthur Hirschfelder has the bluejackets in



FIG. 2. Besides practicing upon one another, the naval hospital apprentices are given demonstrations of adhesive bandaging and of plaster casts. The chief superintendent of nurses at the University of Minnesota conducts the class.

materia medica and pharmacology, a branch of the training stressed because of its everyday practicability aboard ship. A pharmacist's mate in the navy must be what his rating suggests, as well as a capable surgeon's assistant. The work in pharmacology—four and one-half hours a week, of which one third is spent in the laboratory—embodies a course of lectures in elementary chemistry, emphasizing the carbon compounds and the benzol ring, then general pharmacy, with prescription writing the first topic. Next comes a broad survey of anesthesia, its relation to reflexes, and locally, the use of cocaine in selective blocking of the nerve trunk. In order come soporifics and sedatives, salicylates and antipyretics, their properties and use as specifics. Of equal importance is the succeeding subject of circulatory stimulants, drugs acting on vessels, on ganglia, through inhalation, by reflex from stomach, on the secretion and hollow viscera. To the sailors no more interesting study has been presented than to observe the effects of adrenalin, nitrites, digitalis, atropine, pilocarpine, and papaverine, on the circulation in animals. As physicians may

and wax model explanations of epithelial and connective tissues, bones and joints, muscles, membranes and glands, the circulation, the alimentary canal, the entire nervous system and the special sense organs. These lectures are interspersed with frequent written tests.

Physiological chemistry is given the sailors two hours a week by Dr. Chauncey Pettibone. His talks deal mainly with the composition, properties, and importance of carbohydrates, fats, proteins, and inorganic substances, their relation as foods to bodily tissues. In digestion, he takes up the chemical breaking down and absorption of foods; in the chemistry of urine, its composition and pathology; in metabolism, the chemical changes in tissues effected by carbohydrates. Dean Lyon has the physiology, one lecture a week and one demonstration of an hour and a half. His instruction centres around the animal machine—stimulation and response of muscle and nerve, types of stimuli, conduction, the nerve impulse, types of muscle, chemistry of muscle, demonstration of fatigue, hygiene of muscle and nerve, rigor mortis. Then the nervous system—

general structure neurones and nerve fibres, types of nerve fibres, a demonstration of afferent and efferent pathways, the spinal cord and reflexes, the medulla, the cerebellum, and the cerebrum with its motor areas. Finally the circulation, its general scheme of blood pressure; the heart, its structure and control; the bloodvessels and the vasomotor system. Dr. Richard Beard, assistant dean, lectures each week on physiology and hygiene, covering in sequence the topics of blood, respiration, digestion, absorption, physiology of the skin, and heat producers.



FIG. 3.—Naval hospital apprentices computing and administering hypodermics at the University Hospital, Minneapolis, under the direction of the assistant superintendent of nurses.

imagine, extra time is given to the question of purgatives, without which prolonged duty at sea would be supremely inconvenient. Alkali therapy follows, then specific therapy with added details on salvarsan and neosalvarsan, naturally concluding with an exhaustive study of mercury and syphilis. It may be here mentioned that in the university dermatology clinic, in charge of Dr. Samuel Sweitzer, small groups of the navy men assist daily. About 1,200 cases a month are treated in this one clinic, and while syphilis predominates there is enough psoriasis, scleriosis, eczema, and sclerodermatitis to give the bluejackets some good sidelights on diagnosing. The eye and ear and the nose and throat sections of the dispensary are also attended by the sailors.

In anatomy, Dr. C. A. Erdmann, with two assistant instructors, gives a weekly demonstration in the dissecting rooms. The university institute of anatomy, incidentally, is among the finest in the country, and the bluejackets in this course reap exceptional advantages never before extended to any but full fledged college students. In the lectures, three hours a week in addition to the dissecting, Doctor Erdmann gives blackboard, chart

Bacteriology, given by Dr. Winford Larson one entire morning a week, includes the classification of bacteria, a review of morphology preceding the study of pathogens, saprophytes, aerobes, and anaerobes. Then staining and differential stains, cultures, examination of staphylococci, streptococci, pneumococci, Bacillus diphtheriae, and Bacillus tuberculosis. Transmission of infection follows with explanations of such mediums as contact, food and water, insects, and coughing. The course is concluded with a survey of common disinfectants and practical disinfection, and with the bacteriological examination of water. A short course in uranalysis by Doctor Warwick supplements this work in the pathological laboratory. The hospital work, occupying the major portion of every afternoon, is in three general branches; practical nursing, bandaging, and invalid cookery. In dietetics the bluejackets have six and one half hour periods, taking up theory, liquid diet, semisolid diet, light diet, and general diet. Such general bandaging practice as with the gauntlet, spiral reverse, foot and leg, Barton, recurrent, mastoid, and Velpeau, is given. In nursing, besides care of the patient in every particular, pre-

paration for operation, lavage and gavage, venereal treatments, and technic of sterilizing are taught. The value of such finely detailed practice is incalculable.

Ensign Dodge is certain that his hospital apprentices will pass their examinations at the University of Minnesota will go to sea with every prospect of what might be called preearned promotion.

MEDICAL NEWS FROM WASHINGTON.

Health of Navy Good.—To Change Ninety Day Limit on Diseases Developing in Recruits.—Standardizing Management of Recruits with Remediable Defects.

WASHINGTON, March 11, 1918.

The latest reports received at the Navy Department by the bureau of medicine and surgery from medical officers afloat and ashore indicate that the health of the navy continues to be excellent. Only four cases of spinal meningitis were reported last week; and, as they are widely scattered, one being on the west coast, there is no indication of an epidemic. The health conditions at Norfolk and neighboring cities have been given special attention as affecting the health of the naval personnel in that locality aboard ship and shore. Medical Director E. R. Stitt and Surgeon J. R. Phelps, of the navy, recently made a five day inspection in the locality of Norfolk, where they studied the needs of the two naval hospitals in order to determine what they require to keep pace with the development of the new naval base on Hampton Roads and other naval activities in that section.

All of the cities and towns on Hampton Roads are much overcrowded as a result of the war, particularly among the artisan and laboring classes. There exists a great shortage of housing accommodations, and the congestion of the population is becoming acute and makes more liable an outbreak of disease. The water supply was given special attention, as with the growing population the demand has been greatly increased.

The city of Norfolk has its own health department, while the city of Portsmouth and Norfolk county have combined their health and sanitary forces and a reorganization has been effected with the aid of the Public Health Service, which service has loaned a medical officer to act as health officer for the city and county. A representative of the medical department of the navy is serving as sanitary officer of the district.

* * * * *

Complaint has been made to the Secretary of War by members of Congress interested in enlisted men of the army that soldiers are being summarily discharged from the military service within ninety days after enlistment for certain disqualifying disabilities.

It has been held by the medical officers, and adopted as a policy, that such a discharge should be made when an individual manifests a chronic condition, such as tuberculosis for example, within three months after entering the service, on the theory sustained by science that he obviously must

have had the disability before enlistment, and that, therefore, it was not contracted in line of duty. It has been held that this is a fair ruling, and it is still so regarded by the military authorities on the views of the medical officers. The objections to this method of dealing with those that are disabled have attained such influential proportions that steps now have been taken to change the rules, and the Surgeon General of the army has recommended that in all cases where a man has once passed the examination for entering the army he shall be considered to have contracted any subsequently developed disease in line of duty.

* * * * *

In order that there may be a less number of discharges for physical defects of those called to the colors on the second draft than on the first call, a board of officers recently was convened and now is in session at Washington for the purpose of standardizing the management of soldiers with remediable defects and with defects not remediable, but which do not prevent the performance of some military duty.

The board includes some of the most prominent medical officers of the regular army and a number of physicians now temporarily in the service who were among those preeminent in their profession in civil life. The board is made up of the following: Colonel George E. Bushnell, medical corps, retired; Colonel Frederick F. Russell, medical corps; Colonel William H. Moncrief, medical corps, national army; Lieutenant Colonels Thomas L. Rhoads and Philip W. Huntington, medical corps; Lieutenant Colonels Elliot G. Brackett, Walter R. Parker, Warfield T. Longcope, and Pearce Bailey, medical corps, national army; Majors William J. Mayo, Harris P. Mosher, William H. G. Logan, Joseph C. Bloodgood, Charles H. Mayo, and Seale Harris, medical reserve corps, and Contract Surgeon Francis R. Hagner.

* * * * *

The Surgeon General of the army has in view continued improvement in the medical services in the base hospitals, and in this connection he has designated several officers as his representatives to hold conferences with the commanding officers of base hospitals and submit reports and recommendations.

Major Oliver H. Campbell, medical reserve corps, visited Camps Logan and Travis, Tex., and Camp Beauregard, La., for this purpose; Major James C. Greenway, medical reserve corps, Camp Doniphan, Tex., Fort Riley, Kans., and Camp Dodge, Iowa; Major Lawrence Litchfield, medical reserve corps, Camp Greene, N. C., and Camps Wadsworth and Jackson, S. C., and Major John W. Barksdale, medical reserve corps, Camp Funston, Kans., Camp Pike, Ark., and Camps McArthur and Bowie, Tex.

* * * * *

The urgent deficiency appropriation bill as reported to the Senate contains an appropriation of \$30,000 for maintenance and ordinary expenses, exclusive of pay of officers and employees, of quarantine stations under the Public Health Service.

Editorial Notes and Comments

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INCREASE IN RANK AND AUTHORITY FOR MEDICAL OFFICERS.

Several bills have been introduced into Congress to provide for an increase in the rank and authority of medical officers. One of these, introduced by Representative Hicks, of Long Island, was drafted by Dr. Louis Livingstone Seaman and represents the conclusions arrived at by him as a result of his observations of the work of the medical department of the Japanese army in the war between Japan and Russia, and of his experience in our war with Spain. Another, the Dyer bill, is said to represent the views of Dr. Franklin H. Martin, of the medical section of the Council of National Defense.

The war department is giving consideration to these and similar measures and suggestions which involve granting definite authority to medical men and increasing the number of surgeons of high rank in the army. The Secretary of War does not believe that any legislation is needed to provide for medical officers of high rank since the present law gives the President authority to appoint any number of medical officers to the grade of brigadier general and even of major general with the consent of the senate. And the secretary has informed the mem-

bers of Congress who are pressing this point that such appointments will be made when the exigencies of the service should require them.

As to increase of authority of medical officers, Mr. Baker candidly admits perplexity, being confronted with the representations of the surgeons in favor of the plan on the one hand and with the warnings of the line officers against it on the other. The latter, of course, point out their view of the necessity of maintaining and protecting the right of command, with which nothing should be permitted to interfere, lest the success of a military movement be jeopardized. The secretary fully appreciates the necessity of giving the medical officers as much power and authority as possible in the exercise of their duties for the protection of the health of troops, upon which so much depends for the efficiency of the personnel. The medical officers, of course, are making no claim for military authority, but they insist that responsibility shall attach to those that exercise authority. Mr. Baker also realizes the difficulties and dangers of making any hard and fast rule that shall run counter to the right of military command, and he is inclined to prefer the adoption of such regulations as will afford the medical officers abundant opportunity for the discharge of their exacting duties, restricted, however, to recommendations that commanding officers shall be admonished to approve and adopt unless it shall appear that there would be interference with, and menace to, the military control of a situation.

It is to be hoped that definite action will be taken soon, particularly in the matter of higher rank for the senior officers, but early action seems improbable in view of Mr. Baker's visit to France unless, indeed, he acted on the matter before sailing.

THE PATHOGENESIS OF FAMILIAL CHOLEMIA.

The pathogenesis of familial cholemia is not yet clearly understood. That an important factor in this morbid process resides in the biliary ducts, no one denies, and the positive pathological findings of Gilbert show the logic of this hypothesis. It is also possible that the hepatic cells, considered as glandular elements and not simply as a boundary for the biliary canaliculas, are not absolutely unassociated with cholemia and play an active part in this pathological state.

Under the influence of various causes, and they are many, susceptible of changing the he-

patic functions, the normal cell is soon disturbed in its equilibrium and physiology, temporarily or permanently. The cholemic is a patient who carries the heavy burden of a predisposing heredity, and since his hepatic cells are not normal, the cholepoietic function is disturbed. It may be that the liver elaborates a special bile, possessing physicochemical properties different from those of physiological bile, an hypothesis which experimental physiology, regardless of its immense progress, can not verify even in the present enlightened state of our knowledge. There clearly must be some process besides angiocholitis to explain familial cholemia. If Gilbert's hypothesis is strictly adhered to, a permanent infection of the biliary tract must be supposed to exist, and even if this be admitted, this infection must have a mild evolution. Unquestionably, a typhoid fever, a defective diet, or the development of a still much discussed protozoic in the biliary tract, must modify the cholemia and produce a temporary or permanent icterus, but then the process becomes a catarrhal icterus, a lethiasis, or a neoplasia in a cholemic subject.

A cholemic person usually supports his affection well, so that some complication becomes necessary in order to darken the prognosis of the diathesis. An angiocholitis results in icterus from some obstacle preventing the normal flow of bile, so that it is clear that the liver of a cholemic must hypertrophy, just as the right heart does in the case of an old bronchitic. But this does not occur, and alone, an angiocholitis would tend to make a cholemia become an acholuric with icterus, a retention icterus, or an orthopigmentary icterus. Researches have been carried out which show that in many choleemics there is urobilinuria, so that these data place a simple acholuric icterus in the class of icterus from secretory disturbances or metapigmentary icterus. Therefore, it is hardly possible to refuse an important part in the formation of cholemia to the hepatic cell.

This conception may make certain symptoms more comprehensible than angiocholitis alone can explain satisfactorily. If one compares cholemia to renal sclerosis, for example, two stages may be assigned to it, the first being a long one of compensation, during which the pathological state is well borne by the patient. The second stage is that of rupture of the equilibrium and the resulting complications. During the period of compensation, when cholemia often requires a blood examination in order to be diagnosed, so poor and sometimes so fleeting is its symptomatology, hemorrhages are often observed.

Usually the loss of blood takes place in the form of epistaxis of growth, so called, or menorrhagia erroneously termed essential, terms which only serve to conceal our ignorance of the pathogenesis of this diathesis. Gilbert admits the hepatic origin of these hemorrhages and considers them an important symptom, and he even goes so far as to see a close relationship between cholemia and hemophilia.

Undoubtedly, hemorrhage from the nose or gums, hematemesis, melena, purpura, etc., are manifestations which form part of the usual clinical picture of diseases of the liver, but they only occur as distant complications at a time when the normal physiology of the hepatic parenchyma has become thoroughly disturbed. This is so true that unquestionable results obtained from pathological researches have shown that these various forms of hemorrhage, although met with at the beginning of a cirrhosis, in reality correspond to a cell lesion histologically appreciable, but whose restricted extent prevents a clinical diagnosis from being made. Another proof of the functional trouble of the hepatic cell is furnished by the examination of the urine. In choleemics, the existence of disturbances of the hepatic chemism is revealed by digestive glycosuria and hypozoturia. Finally, the violent migraine frequently met with in choleemics may, perhaps, be accounted for by a functional disturbance of the liver, which plays such an important part in the neutralization of toxins.

The absence of hepatic hypertrophy and the presence of urobilinuria, early hemorrhagic symptoms, and various disturbances of the hepatic chemism seem to show that a mild ascending infectious angiocholitis is not the only process in cholemia, and that in the pathogenesis of this morbid process a large share should be accorded to functional disturbances of the hepatic cell. The hypothesis of an angiocholitis cannot be rejected, since we have the proof of its existence, but it may be assumed that the functional disturbance of the hepatic parenchyma is otherwise important and plays a decisive part in the pathogenesis of familial cholemia.

If this pathogenic conception is not admitted, the type described by Gilbert would only be a subclass of cholemic hepatitis, a cholemia from an angiocholitis. In other words, in the cholemia class, a distinction would have to be made between a cholemia from angiocholitis and biliary lithiasis, and functional disturbance of the liver, excessive hemolysis, etc. Such a classification might be theoretically satisfactory, but could hardly be so from the clinical viewpoint.

THE BIRTH RATE AND THE WAR.

The rest may reason and welcome,
'Tis we statisticians know.

All of us have our notions as to the cause or causes of the war. They are mostly notions and superficial enough. The statisticians, dealing with large facts as represented by large figures, have their ideals on the subject, or at least some of them have. As some of them read the signs, in figures, all this hell let loose can be traced to the overcrowding of German soil and a need for territorial expansion, brought about, of course, by a too high birth rate as compared with the death rate. Yet in the same breath the same statisticians lament the declining birth rates elsewhere as the direst calamity that could befall a nation. It is difficult to see wherein consistency is to be found here unless in believing that war is a desirable condition and that birth rates ought to be high in order that nations may spill over their boundary fences and destroy each other.

Unless one sees good in war—and the statistician would probably be the last to be of this opinion—and if this theory of the cause of the war is correct, there seems little reason for mourning a declining birth rate. On the other hand, one must lament that such a decline had not begun earlier with the Central Powers. The declining birth rate, like the war, is with us as a fact, and each had its good or evil cause, which statisticians and those of us with narrower glimpse of the trend of things were powerless to prevent. Moreover, it will remain with us until the conditions that started it are changed, if they ever are.

The declining birth rate has been significantly coincident with the shifting from suburban to urban existence, to conditions of living which are certainly not the best for the development of a strong people, for the vigor of the city has always been supplied from the country. The chief objection by the statisticians to the declining rate is that it leaves the community with a larger proportion of people at the older and less vigorous ages, but this condition exists only, of course, while the decline is in process and is not so dreadful, except for purposes of war, since it ends when a stage of equilibrium is reached.

While everything that is may not be best, it is evidently best under the circumstances, even war itself. The shrinking family is undoubtedly the best family under present conditions. If overpopulation leads to such wars as this, let us pray that births decline everywhere to a peace

footing rate as rapidly as possible. For what profiteth it to bring forth brave men if they are to be killed off in the age period that they are of most worth to society and in which they should help to bring forth a better race?

PROVIDING FOR DISABLED SOLDIERS

In view of the marked socialistic tendencies in New Zealand, a study of the provisions which have been made for disabled soldiers there suggests interesting and helpful points on what we may hope to do for our own soldiers when they begin to return from the trenches unfitted by wounds to take their places in the ranks of normal workers. Dr. Douglas C. McMurtrie, director of the Red Cross Institute for Crippled and Disabled Men in New York, has just published a valuable and informing memorandum on this topic.

Up to June 21, 1917, 9,070 returned soldiers have been registered by the Discharged Soldiers' Information Department of the New Zealand Government with a view to providing employment for them. Of these, 7,298 had been disposed of, being placed in employment, returned to military duty, or having signed a statement that they do not require the department's assistance; 881 cases were still under action; 692 cases were not yet ready for action, the men having but recently arrived or being not yet discharged by military authorities; 199 men were open for employment. There seems to have been little difficulty in obtaining employment, but curiously enough, the results of the elaborate efforts which have been made to provide special training or reeducation for disabled men have not been encouraging. Though the opportunities for such reeducation have been persistently and systematically brought before the men, many of them have remained indifferent. This may be accounted for partly by the promptness with which situations have been found for those who desire employment. Another difficulty was also met which would not exist with us, for the department of labor has prescribed minimum weekly wages in many occupations in New Zealand, and it has become necessary for the department to issue an order in council approving changes in these minimum rates for returned, partially disabled soldiers.

The indisposition on the part of the men to undertake special training is surprising in view of the fact that the Government has decided to allow a maintenance fund not in excess of one pound a week, irrespective of pension payments.

to disabled men attending classes. The range of vocations open to disabled soldiers is very wide. The only restriction placed upon the character of the class is that the subject must be approved as suitable for the individual case and that the man must attend the classes regularly, conduct himself properly, and make satisfactory progress.

A summary of the pensions awarded to the men who have returned show that a large number are suffering from serious disabilities, the amount of the pension being determined by the degree of disability. Among those who found employment and received pensions of one pound, five shillings a week or more, forty-seven received that sum, 146 received one pound, ten shillings, and eighty received one pound, fifteen shillings. A movement to establish special schools of instruction for the returned soldiers was defeated on the ground that such schools would be temporary and that it would therefore be much better to make use of institutions already established. Doctor McMurtrie has performed a genuine service in presenting for our information a summary of the work done along this line in New Zealand.

EFFECT OF MALNUTRITION AMONG SCHOOL CHILDREN.

A physical survey of the 171,691 school children in the public schools of the Borough of Manhattan has recently been completed by the Bureau of Child Hygiene of the Department of Health of the City of New York. The survey was made during very inclement weather and consequently was far below the registration figures for the borough and probably represents the harder children, the weaker ones no doubt having been absent from school. This survey showed that 22.5 per cent. of the children of six years of age were undernourished. The proportion of undernourished increased up to the age of nine years when the maximum of 25.2 per cent. of undernourished children were found, declining gradually to 12.2 per cent. at the age of sixteen. In issuing these statistics the department says that it is probable that only 17.3 per cent. of the children represent a normal degree of nutrition; 61.1 per cent. are passably well fed or on the borderline; 18.5 per cent. are underfed; and 3.1 per cent. are in a bad stage of malnutrition. It is somewhat surprising to learn that nationality did not play an important part in the prevalence of malnutrition. The Russians and Poles were a little below the average and the Italians were still lower. This does not mean that the children are starving, but merely that they had been subjected to a long continued underfeeding or wrong feeding. It was pointed out that there has been an increase in the proportion of malnutrition which is coincident with and dependent upon the buying power of the dollar. Relief

may be effected partially by instruction of the mothers as to the economical use of their money in purchasing and preparing foods, but this must also be supplemented by public or private charity.

IMPROVED HEALTH CONDITIONS.

Notwithstanding the untoward effects of the most severe winter in the history of the city of New York, combined with a scarcity of fuel, the death rate in this city for the first two months of this year was less than for the corresponding period of 1917, the rate for 1918 having been 15.51 and for 1917 16.97 per thousand. This means that 2,645 lives were saved during the first two months of this year. A noteworthy reduction has been effected in the mortality from lobar pneumonia in which the number of deaths has declined by 450 as compared with the deaths in 1917. On the other hand there has been a decline of 2,206 in the births for that period, while the number of marriages for the first two months of 1918 were only 6,369 as compared with 11,187 during the first two months of 1917, a decline of almost 58 per cent. This remarkable decline in the number of marriages is attributable no doubt to the fact that the draft has taken out of civil life so many men of the marrying age.

THE IMPORTANCE OF REPORTING BIRTHS.

The Department of Health of the City of New York sounded a warning in its latest bulletin on the importance of reporting births. While there has been a marked improvement in this respect, cases of negligence are still met with from time to time. A failure to report a birth may prove a very serious matter to the child at some future time. Dr. Shirley Wynne, assistant registrar of records, says that recently a case came to trial in this city involving millions of dollars which hinged upon the birth certificate of the only heir, it having been charged that this heir was a foundling and not the child of the wife of the deceased. This is only one of many cases in which a certificate of birth is of grave legal importance. Moreover, the statistics for health administration are incomplete and misleading unless an accurate register of births is in existence.

News Items.

Six New York Physicians Receive Commissions.—The following New York physicians received commissions on March 12th as first lieutenants in the Medical Reserve Corps. U. S. Army; Dr. Abraham Feldman, Dr. Abram B. Bruner, Dr. Ethelbert A. Callaghan, Dr. James P. Croce, Dr. Samuel Kraushar, and Dr. Sidney L. Spiegelberg.

Rockefeller Foundation Appropriations.—The Rockefeller Foundation has appropriated \$125,000 to continue the war demonstration hospital at the Rockefeller Institute. \$50,000 for the work of the medical division of the Rational Research Council of the Council of National Defense, and \$12,281 for other medical war research and relief work.

Smallpox in New York City.—During the year 1917 fourteen cases of smallpox were reported to the Department of Health of the City of New York, of which eleven were contracted out of town. One patient came from the South, eight from the West, one from Connecticut, and one from up State. Six of the fourteen patients were negroes. During January and February, 1918, five cases of smallpox have occurred in the city of New York. Two of the patients contracted the disease outside of the city, one in Bristol, Pa., and the other probably in Newark, N. J. Four of the five cases were in negroes.

Laboratory Course for War Service.—With the co-operation of the War Service Committee of the Medical Women's National Association a second course in medical laboratory work is offered. The object is to fit workers for war service in medical laboratories in this country and in Europe. Dr. William H. Park, Dr. Anna W. Williams, and Dr. Elise L'Esperance are in charge of the course, which will extend over a period of three months, requiring six hours' work each day. The fee for the course is \$75. New York University, Cornell Medical College, and the Department of Health have offered the use of their laboratories. Classes will be limited to about twenty students. Application may be made to Dr. Anna W. Williams, Research Laboratory, foot of East Sixteenth Street, New York.

The Study of Maternal Mortality.—At a meeting of the New York Obstetrical Society, held on February 12th, the following resolutions were adopted in reference to the study of maternal mortality which has been undertaken by the Public Health Committee of the New York Academy of Medicine:

WHEREAS, The advisability of an intensive study of the mortality associated with child bearing would prove of undoubted advantage to the medical profession and the public; and

WHEREAS, Such a study, based on statistics derived from hospitals of this borough, is about to be undertaken with the assistance of the Public Health Committee of the New York Academy of Medicine, therefore, be it

Resolved, That the investigation of the mortality associated with child bearing, instituted by the Public Health Committee of the New York Academy of Medicine, as presented at the meeting of February 12, 1918, receive the hearty cooperation and endorsement of the New York Obstetrical Society.

Medical Association of the Greater City of New York.—A stated meeting of the association will be held in Du Bois Hall, New York Academy of Medicine, Monday evening, March 18th. The program will consist of a symposium on the prevention of disease in the army, papers on the subject to be read as follows: Prevention of Important Diseases, by Dr. William H. Park, director of the Bureau of Laboratories, Department of Health of the City of New York; Venereal Diseases, by Dr. Sigmund Pollitzer, of the Surgeon General's Advisory Board for Skin and Venereal Diseases; Camp Sanitation, by Dr. A. W. Schoenleber, Division Sanitary Officer, Camp Upton. The subject will be discussed by Dr. Reynold Webb Wilcox, Dr. Harlow Brooks, Colonel E. E. Persons, Army Ambulance Concentration Camp, Allentown; Dr. Henry M. Moses, chief of the Medical Service, Base Hospital 37; Dr. Alec N. Thomson, of the Division of Venereal Diseases, Surgeon General's Office.

Meetings of Medical Societies to Be Held in New York during the Coming Week.—Monday, March 18th, New York Academy of Medicine (Section in Ophthalmology), Medical Association of the Greater City of New York, Psychiatric Society of Ward's Island; Tuesday, March 19th, New York Academy of Medicine (Section in Medicine), Tri-Professional Medical Society of New York, Medical Society of the County of Kings, Federation of Medical Economic Leagues of New York; Wednesday, March 20th, New York Academy of Medicine (Section in Genitourinary Diseases), Alumni Association of City Hospital, New York, Women's Medical Association of New York City (New York Academy of Medicine), Medicolegal Society, New York, Northwestern Medical and Surgical Society of New York, Bronx County Medical Society; Thursday, March 21st, New York Academy of Medicine (stated meeting), German Medical Society, Brooklyn, New York Celtic Medical Society; Friday, March 22d, Society of New York German Physicians, New York Clinical Society, Manhattan Medical Society, Brooklyn Society of Internal Medicine, Italian Medical Society of New York; Saturday, March 23d, New York Medical and Surgical Society, West End Medical Society, Lenox Medical and Surgical Society.

Gift to Hospital Ships.—The National Society of the Colonial Dames of America has raised \$50,000 for the purpose of equipping the operating rooms of the two hospital ships, *Comfort* and *Mercy*, now being fitted out for the use of the Navy. The fund was presented through the Red Cross. The gift not only provides the ordinary operating equipment for the rooms, but is furnishing the x ray apparatus for each, with special drugs, and is supplying moving picture reels, phonograph records, and other articles which will contribute to the comfort and recreation of the invalids.

Child Welfare in Oklahoma.—The National Child Labor Committee, at the request of the University of Oklahoma, has made a study of child welfare conditions in Oklahoma for the purpose of gathering information regarding actual conditions to be used as the basis for legislative action. The report of the committee, which has just been published, covers a wide range of subjects, public health work, recreation, education, child labor on farms and in cities, agriculture, juvenile courts and probation, institutional care of children and home findings, poor relief, together with a survey of the State laws and their administration.

Meetings of Medical Societies to Be Held in Philadelphia during the Coming Week.—Monday, March 18th, Academy of Medicine and Allied Sciences, Blockley Medical Society, Medical Society of Woman's Hospital; Tuesday, March 19th, Mount Sinai Hospital Clinical Society, West Branch of the County Medical Society; Wednesday, March 20th, Academy of Stomatology, Section on Otology and Laryngology, College of Physicians; Thursday, March 21st, Section in Ophthalmology of the College of Physicians, Northeast Branch of the County Medical Society, Southeast Branch of the County Medical Society; Friday, March 22d, Northern Medical Association, South Branch of the County Medical Society.

Civil Service Examinations for Superintendents of County Tuberculosis Hospitals.—The New York State Civil Service Commission announces examinations to be held on April 6th for superintendents of Steuben and Niagara County Tuberculosis Hospitals. Applicants must be licensed physicians of New York State, graduates of an incorporated medical college, and have had at least three years experience in the actual practice of medicine. The Steuben County Tuberculosis Hospital is situated at Bath, and the Niagara County institution at Lockport. It is expected that both hospitals will be opened about July 1st. Persons desiring to take these examinations should notify the State Civil Service Commission at once and secure the proper application forms. Applications must be filed with the commission at Albany not later than April 1, 1918.

American Posture League.—At the annual meeting of the league, which took place Saturday evening, March 9th, the following officers were elected: Miss Jessie H. Bancroft, president; Captain Frederick R. Green, vice-president; Dr. Henry Ling Taylor, secretary, and Dr. Percy W. Roberts, treasurer. The reports for the year showed a great activity in relation to war conditions, and a large demand on the resources of the American Posture League, as a national health organization, indicating a quickened public conscience on the subject of health since the physical examination for the army disclosed such a low standard of health throughout the country. The Technical Committees of the league reported completed work for the year on factory and school seats, shoes and other articles of clothing for men women and children, besides a large educational service.

Promotions in the Medical Corps.—The Judge Advocate General of the U. S. Army recently rendered the following opinion regarding promotions in the Medical Corps:

Section 10 of the national defense act provides that persons hereafter commissioned in the Medical Corps shall be promoted to the grade of captain after five years' service in the Medical Corps and upon passing the examinations prescribed by the President for promotion. Public 86, Sixty-fifth Congress, provides that during the present emergency first lieutenants in the Medical Corps of the Regular Army and of the National Guard shall be eligible to promotion as captain upon such examination as may be prescribed by the Secretary of War. Construing these provisions together with section 124 of national defense act, it is held that all vacancies in the Medical Corps must be filled by permanent or temporary promotions, according to the character of the vacancy, of officers in the Medical Corps below the grade in which the vacancy exists, in order of seniority, subject to the required examinations. Temporary appointments can be resorted to only when possibilities of promotions by seniority have been exhausted.

Modern Treatment and Preventive Medicine

A Compendium of Therapeutics and Prophylaxis, Original and Adapted

TREATMENT OF SLEEPLESSNESS.

By LOUIS T. DE M. SAJOUS, B. S., M. D.,
Philadelphia.

(Concluded from page 469.)

The stress laid by physiologists on the control exercised by general blood pressure conditions on the intracranial circulation cannot but suggest that, under abnormal conditions, high blood pressure may be a cause of sleeplessness through the maintenance of an excessive intracranial blood supply at night. Apart from cerebral arteriosclerosis, which leads typically to a reduction in the blood supply to the brain, clinical arteriosclerosis of the generalized form results, in about three fourths of all cases, in a heightened blood pressure and this, in turn, promotes sleeplessness. Insomnia may be produced in the same manner in chronic renal disease, though both under these circumstances and in non-renal arteriosclerosis the probability of a toxic factor tending to cause sleeplessness directly by irritation of nervous tissue has also to be borne in mind. In senile insomnia, where arteriosclerosis and heightened blood pressure exist, the latter condition may similarly be a cause, though Sir James Sawyer, 1912, recognizes, too, a senile form of degeneration of the smaller cerebral arteries, which are less elastic and contractile than normally, and may become dilated, the local blood supply being thus only with difficulty reduced enough to permit of sleep.

The excitative form of insomnia, which we have deemed worthy of recognition as a separate type in contradistinction to the congestive form, includes the various cases of sleeplessness resulting from afferent impressions, such as pain and dyspnea, and other "nervous" cases following overwork with anxiety, excessive emotions, grief, etc. Insomnia in neurasthenia, it is believed, may be the result of a nutritional defect, and there are many indications that in various states associated with abnormal nervous irritability, which in turn may lead to sleeplessness, deficiency of nutrition or oxygenation of the nerve cells, providing it does not exceed a certain limit, is the cause of this abnormal irritability. The pain which sometimes results from sclerotic narrowing of arteries, as in intermittent claudication, angina pectoris, and the headache of cerebral arteriosclerosis, and also the recognized states of increased excitability or actual convulsions induced by partial asphyxia of nervous tissues, appear to be legitimate examples of the sequence of events referred to. The same factor—insufficiency of pabulum or oxygen to nerve centres—may possibly apply also in the sleeplessness of heart disease and anemia, though of course other causes related to an altered distribution of the blood or the actions of toxic materials on the circulation or the nerve centres themselves are doubtless likewise operative in these cases.

Removal of the cause is throughout to be kept in

mind as a fundamental aim. In arteriosclerotic and renal insomnia, while such an object is difficult or impossible of attainment, measures, chiefly hygienic and dietetic, can at least be taken to hinder the progress of the disease and even, by eliminatory treatment, to remove more or less completely for the time being toxic factors, the influence of which in inducing sleeplessness has been emphasized above. Naylor, 1909, advises, in insomnia dependent upon retention of waste products, the administration of a two or three grain dose of calomel three times a week. Similarly, Huchard recommended, to restore the habit of sleep in cases of high arterial tension apparently due to imperfect metabolism, the giving of 0.1 grain of calomel three times a day. Purgation may serve not only as an eliminatory measure, but also to some extent by depleting the circulation, as may also diaphoresis and diuresis. In the cases of arteriosclerosis or renal disease in which sleeplessness seems chiefly due to high blood pressure, the pressure factor can sometimes be satisfactorily overcome, and sleep facilitated, by spirit of nitrous ether, with or without a small dose of tincture of aconite. The postural, hydrotherapeutic, and other hygienic measures previously described may also be of some utility. Temporarily, or in the event of failure of all other means, hypnotic drugs may be required.

In "nervous" insomnia the physician should, as emphasized by Hale White, first make certain of the reality of the symptom, some patients merely thinking, or even dreaming, that they do not sleep, where, as a matter of fact, there is little or no sleep deficiency. A good test of actual insomnia is an attempt by the patient to recollect having heard the clock strike certain hours during the night. Often a patient is unnecessarily alarmed as a result of brief periods of sleeplessness, and needs to be assured that rest in bed in the waking state, unless it takes up a large portion of the night, is almost as useful from the standpoint of body repair as actual sleep. Special devices intended to change the current of mental activity and favor sleep, such as counting backward, striving to keep the eyes open, taking deep inspirations, or thinking of the breath passing from the nostrils in a continuous stream (Binns), are as a rule but slightly effectual: possibly concentration of the mind on the word "nothing" is the best plan of this nature. In most cases of "nervous" insomnia, nonpharmaceutical general measures promoting sleep, such as a light meal or warm bath before bedtime, or a short walk in the evening, together with certain sleepfavoring precautions at night, viz., proper quiet, bed clothing, and ventilation, are of some service. Lack of sleep is also partly due to disregard of the physiological principle of rhythmicity, which when allowed to be operative, tends to insure the induction of certain functions at specified hours of the day. Such patients should retire to bed at a fixed time, and also to rise after a specified sleeping period.

Causal treatment varies widely with the nature of the cause. In sleeplessness fostered by worry and overwork or by grief, mental distraction, as by games soliciting undivided attention, or a complete change of scene, are among the most useful nonpharmaceutical measures. In insomnia due to pain or other discomfort, appropriate cause removing treatment should be promptly brought into play. In the sleeplessness of exophthalmic goitre, in the etiology of which the importance of toxic as well as emotional factors is becoming increasingly apparent, eliminatory treatment may be serviceable, along with other procedures. According to W. H. Thomson, 1914, one grain of calomel with two teaspoonfuls of compound licorice powder, taken at bedtime, acts as an excellent soporific in some cases of sleeplessness in this disease. In insomnia occurring in neurasthenia and associated with excessive irritability of nervous tissues, rest and the various other recognized measures which tend to reduce the morbid irritability, viz., a nourishing but unstimulating diet, outdoor air and recreation, and hopeful assurances constantly repeated, constitute the most direct rational mode of treatment. Among anemic patients sleeplessness is most rationally and affectually treated by hematonics, and in heart disease the excitative factor dependent upon insufficient oxygenation of the nerve centres will usually be overcome by cardiac tonics.

Hypnotic drugs in excitative insomnia are, as a rule, to be avoided unless other measures fail. Repeated use of such drugs not only leads toward habituation and eventual chronic poisoning, but may even result in sudden death from cumulative action or the taking of an excessive dose during the night by a patient mentally confused from the effects of a moderate dose ingested on retiring. Bromides are among the safest hypnotics, and in full doses are frequently sufficient. Chloral hydrate remains the standard among the more positively acting remedies, and its property of directly relaxing the vessel walls is often advantageous. Paraldehyde, fairly certain in action, has by some been held less likely to lead to habituation than other drugs on account of the persistent odor it imparts to the breath. No patient should be allowed, however, to dose himself with hypnotics according to his own judgment. Occasionally, as in insomnia due to some sudden shock or strain, artificial induction of sleep for a few successive nights may be the most effectual plan of treatment.

Asthmatic Paroxysms.—Camescasse (*Presse médicale*, December 20, 1917) reports constantly successful results in asthma from combined administration of strontium bromide and injections of camphorated oil. As a preliminary measure, salt should be at least in part proscribed from the diet. In adults the daily dose of the bromide is four grams; occasionally as much as six grams is required. On the first day, two injections of a ten per cent. solution of camphor in oil, two mls at a dose, are given. Improvement occurs promptly, at times immediately.

Tetany in Pregnancy and Parturiency.—Hans Guggisberg (*Correspondenz-Blatt für Schweizer Aerzte*, December 15, 1917) says that the treatment of tetany in these cases does not differ essentially from that of the other forms. Because of the parathyroid origin of tetany the implantation of parathyroids suggests itself, but experiments on animals have shown that after a certain time changes take place in the transplanted organs so that permanent results are rare. No attempt to control puerperal tetany by the transplantation of a parathyroid from a fresh cadaver has yet been published. The administration of parathyroid preparations has given good results in some cases, but has failed completely in others. The same is true of thyroid treatment. Serum treatment he looks upon as hopeless. He considers calcium chloride or lactate valuable, and reports a case in which he obtained excellent results from the administration of one gram of calcium lactate four to six times a day. Milk and vegetables contain calcium and therefore are useful, but the salt in the food should be reduced as much as possible so as to give the calcium salts a better opportunity. Drugs to be avoided because liable to excite an attack of tetany include morphine, ergot, atropine, calomel, tuberculin, chloroform, and ether. As the attacks are often accompanied by pain, narcotics may be indicated. The derivatives of opium are not without danger, and it is better to rely on chloral hydrate or the bromides. He is not in favor of treating the tetany by terminating the pregnancy.

Intraspinal Therapy in Urology.—Ernest M. Watson (*Journal A. M. A.*, February 2, 1918) subjected sixteen cases of tabes and cerebrospinal syphilis, with symptoms referable mainly to the urinary tract, to intraspinal treatment with mercurialized serum and obtained better results than usually follow other methods of treatment. The treatments usually consisted of the intraspinal injection of one milligram—0.02 grain—of mercuric chloride in normal horse serum, diluted with normal salt solution to a volume of thirty mls. The injections were made about once weekly for four doses, followed by a rest of four to eight weeks. The treatment was never followed by any anaphylactic symptoms, and the reactions were never more than moderate in intensity. The treatment changed the spinal Wassermann reaction from positive to negative in seven cases, and greatly reduced the degree of fixation in six others. The colloidal gold curve was made negative in five cases and was much reduced in five others. The cell count was reduced in eleven cases and the excess of globulin in six. Marked urinary incontinence was cured in one case, greatly improved in another, and not affected in a third. Slight incontinence was cured in three and much relieved in four more. Increased frequency was cured or much diminished in eight cases; dribbling after voiding was cured in four, and improved in six, and the sexual powers were improved in six cases and restored to normal in two others. All eleven of the patients having pains in back and legs were relieved of these, and the residual urine was greatly diminished in all twelve patients who had this condition.

Study of Cases Treated by Flavine.—E. F. Bashford, J. N. J. Hartley, and John T. Morrison (*British Medical Journal*, December 29, 1917) made a very careful study of fifty cases of recent military wounds under treatment with flavine in 1:1,000 solution, and used such criteria as the average date when normal temperature was reached, the average date when the microbial curve reached Carrel's suture standard, the average duration of treatment before the wounds could be closed, and the date of complete healing. They also made careful histological studies of material taken from the wounds under treatment at various stages of their course. Their results showed that flavine treatment was associated with a very small formation of pus; with much slowed epithelial ingrowth; with much delay in all the processes of repair; with a lingering of organisms on the surface of the wounds; and with a reduction in the local and general reaction to infection. The most striking feature of the application of flavine even in this weak solution was the marked destruction of the cellular elements of the tissues of the wound with hemorrhages and thromboses in the vessels deep in the wound and consequent great interference with the normal processes of healing. These destructive effects of the flavine led to the greatly diminished pus production. The results were particularly unfavorable compared with those in similar cases treated by the Carrel-Dakin method.

Treatment of Severe Tetanus.—Navroji Ardeshr Cooper (*Lancet*, December 22, 1917) reports results varying from twenty to forty-two per cent. of recoveries as the result of treatment of developed, severe tetanus occurring in native Indian civilians. None of the patients had received prophylactic doses of antitoxin, and a very large proportion of the patients were brought to the hospital only after it was seen that religious and magical treatment had failed. The following is the treatment for an adult with severe symptoms:

Chloral hydrate,	1.3 (gr. xx)
Potassii bromidi	1.3 (gr. xx)
Tinctura digitalis	0.6 (m. x)
Tinctura hyoscyami	1.3 (m. xx)
Spiritus chloroformi	0.6 (m. x)
Aque chloroformi	30.0 (oz. i)

This is given every four hours by mouth: the following twice daily by rectum:

Chloretone	2.0 (gr. xxx)
Olei olivae	125.0 (oz. iv)

The bowels are kept open by an evening dose of calomel, 0.3 gram—five grains—and sodium bicarbonate, 0.6 gram—ten grains. In addition to the above from thirty to forty mils of a five per cent. sterile solution of chloral hydrate are injected intravenously daily until sound sleep is produced. A daily intravenous dose of 3,000 units or more of antitetanic serum is injected intravenously until the spasms have stopped. The chloral hydrate and chloretone, by vein and rectum respectively, are continued daily until contraindicated by cardiac weakness or the patient becomes too low, when they are discontinued and the chloral hydrate and potassium bromide of the first formula are also replaced by ammonium bromide and caffeine citrate. Alcohol, pituitary, epinephrine, morphine, camphor, etc., are given as required.

Analysis of Cases of Tetanus Treated in Home Military Hospitals.—David Bruce (*Lancet*, December 22, 1917) presents his fifth consecutive analysis of the results of treatment of cases of tetanus, covering the last 100 consecutive cases. The mortality has steadily been reduced since the first analysis of 231 cases, made in 1914-1915 and for the five consecutive analyses has shown the following percentages: 57.7, 49.2, 36.5, 31.0, and 19.0. The cause of the steady decline in the mortality can not be definitely assigned, but the factors involved are the earlier and more constant use of prophylactic injections of antitoxin, improved surgical treatment, earlier diagnosis, and more thorough therapeutic treatment. A noticeable feature of the last 100 cases is the prolongation of the incubation period; the disease developed within the first ten days in only ten cases; in twenty-four within the eleventh to the twenty-fourth day, and in sixty-six later than the twenty-fourth day. The proportion of cases with local tetanus only also increased, and all of these patients recovered. The figures thus far obtained offer no case either for or against the injection of antitoxin by the intrathecal route.

War Deafness.—Stacy R. Guild (*Journal of Laboratory and Clinical Medicine*, January, 1918) conducted a number of experiments to test the relative efficiency of various devices for preventing injuries to the ear parts by detonation. The observations on the middle ear are reported in the present paper; the cochlear parts will be the subject of a later report. Guineapigs were used for the work with specially prepared rubber "ears" for holding the device to be tested. The source of the detonation wave was the firing of a forty-five calibre Colt automatic pistol. It was found that the Scientific Ear Drum Protector "Tommy" and the Mallock-Armstrong Ear Defender were the most efficient of the eight devices tried. For any but military use, the latter is to be preferred, but for army use, there are certain objections to it, namely, that a projectile passing alongside the head, wounding only the pinna, or the outer part of the external meatus, in itself a relatively slight injury, and quite a common one, would shatter any hard obturator present and form secondary projectiles of the fragments, thus complicating the wound. The "Tommy" has another advantage over the Mallock-Armstrong device in that it is the simplest possible thing to keep clean. Next in merit comes the wax cone of the Italian navy type, which is closely followed by cotton soaked in vaselin. Because of the availability of the last measure, it is worthy of note, and the extra protection obtained by mixing the cotton with vaselin is well worth the trouble, as a comparison of this record with dry cotton will show. Cotton soaked with glycerin was less satisfactory. Dry cotton, the Elliott Perfect Ear Protector, and the Wilson-Michelson device ranked together as giving the least protection to the middle ear of animals used. Testing devices for the relative amount of reducing ordinary sounds was tried, but results were contradictory. Of mechanical devices, the Elliott reduces ordinary sounds the least, and the "Tommy" the most, the latter cutting them down more than dry cotton does.

Pneumonia in Children.—H. Brooker Mills (*Dominion Medical Monthly*, January, 1918) prefers to feed the child by enteroclysis in cases of irritable stomach, giving four ounces of a five per cent. solution of glucose by the Murphy drip, twenty drops to the minute, every four hours. In breast fed children it is best to withdraw the milk from the mother's breast and feed it to the baby by means of a Breck feeder. Where the temperature is high it should first be peptonized. Where prolonged stimulation is necessary, enteroclysis of hot coffee four ounces, by the Murphy drip, twenty drops a minute, is given every four hours. To this a dram of whiskey may be added. Dry cupping and hot mustard applications are the best external agents. The latter is made by adding a teaspoonful of mustard to a pint of hot water. A piece of flannel of four thicknesses is wrung out of this and applied to the chest for twenty minutes. This is repeated every two or four hours as necessary. For inhalations give creosote, benzoïn, tinctura opii camphorate, and oil of eucalyptus. Opium should not be administered for restlessness. An ice bag to the head and a hot water bottle to the feet, tepid sponges, and high colonic irrigations should be employed. Castor oil should not be administered as an initial cathartic excepting when the child is suffering from diarrhea, as the subsequent constipation might prove to be a complication. Milk of magnesia is better, but the best cathartic is calomel in powdered form given dry on the tongue followed by milk of magnesia or a saturated solution of magnesium sulphate in orange juice. Digitalis and ammonia should be avoided as stimulants. Nitroglycerin is indicated in cases of cyanosis with a mottled appearance of the face, strophanthus in cases of rapid but regular pulse, and strychnine in cases of broken compensation. All should be administered hypodermically. Caffeine sodium benzoate is also of value. Respiratory failure calls for atropine by hypodermic and oxygen inhalations. Balneotherapy and hydrotherapy are valuable adjuncts in the treatment of pneumonia in children and may often obviate the necessity of using nauseating cough mixtures, antipyretics, and stimulants, thus saving the gastrointestinal tract.

Penetrating Gunshot Wounds of the Chest.—G. E. Gask and K. D. Wilkinson (*British Medical Journal*, December 15, 1917) draw upon an experience of 500 cases, 365 of which were followed to ultimate outcome. They state the following as contraindications for operative treatment: shock or collapse of such a grade as would contraindicate any surgical measure; small and clean wounds without evidence of any serious intrathoracic injury; retention of a foreign body which is small; and collapse of the lung on the opposite side. Under most other circumstances operation is the treatment of choice and should be performed as soon as the patient has had time to recover sufficiently from the primary shock, which is usually within the first six hours. Even where nothing further is required wounds of the soft parts, unless very small and clean, should be excised to prevent supuration and spreading infection. General anesthesia with chloroform or gas and oxygen is required and is usually well borne.

The opening into the chest should be ample to permit thorough exploration and the insertion of the gloved hand, which means an incision six inches long with the removal of four inches of rib. This latter should be done subperiosteally. The thoracotomy may be performed through the original wound or made at the point of election, which is usually at the fifth or sixth rib in the anterior axilla. When made through the original wound this must be excised completely, including the skin and muscles and the broken ends of ribs. When the chest is opened wide all blood and clots should be removed, preferably by gentle mopping and the use of the hand. The hand should then be introduced into the chest and swept about to detect for removal all foreign bodies and pieces of broken ribs. If a foreign body is lodged in the lung it can be removed easily through an incision if necessary. If the wound in the lung is badly torn and jagged it should be excised and sutured. If the lung is incised for the removal of a foreign body the cut should also be sutured. If the pleural cavity has been much soiled it may be washed with warm saline or eusol, but it must always be mopped dry and left so. The chest wound should then be closed, pleura to pleura, muscle to muscle, and skin to skin. No matter what the operation the chest wound must be closed, and if there is not enough tissue, muscle and skin flaps should be used. Where the abdomen is wounded along with the chest it is usually advisable to repair the abdominal wound first if the diaphragm is involved. In the 365 cases followed throughout their course there was just under twenty-one per cent. of mortality, including that from all complications, while if the deaths from complications alone be excluded the mortality for 320 cases of chest injury was only 9.6 per cent.

Amputations of the Lower Extremity in War Surgery.—A. Mouchet (*Paris médical*, December 29, 1917) notes that the indications for amputation are becoming more and more restricted. Primary amputations are performed only in crushing injuries of a limb or in injuries of the femoral or popliteal vessels. Secondary amputation may be required because of aggravation of the general condition, rapid septicemia, gas gangrene, or grave secondary hemorrhage. Late amputations are done for chronic progressive septicemias, related to infected compound fractures, osteoarthritis with bone lesions extending to a distance, or arthritis of the foot or knee. In amputating at the thigh, the simple circular method in one plane is indicated only in extreme haste or for motives of tissue economy; in all other instances the circular method with lateral incisions added is preferable. As infection wanes, continuous extension of the flaps with adhesive strips should be promptly instituted to facilitate the formation of a good stump. For disarticulation at the hip, which causes excessive shock, the Volkmann-Pollosson procedure should be substituted wherever possible; a thigh amputation is performed as high up as practicable, all bleeding carefully checked, and at a second operation through an external incision, the upper end of the femur removed. Intracondylar amputation is to be preferred to disarticulation at the knee. Leg amputations should be performed as

low as possible, with a posterior flap and the fibula cut several centimetres above the tibia. In wounds of the toes, conservative treatment is unnecessary except in the case of the great toe. In wounds of the anterior portion of the foot, removal of the metatarsals, except the first and fifth, can be performed without hesitation. Lisfranc's procedure, while a good operation, can only infrequently be performed because of the large plantar flap required. Ricard's tibio-calcaneal amputation should always be preferred to Chopart's operation. It is essentially a Chopart operation with added removal of the astragalus, thus removing the necessity of a large plantar flap. Where the os calcis is rather broad, it can be resected at the sustentaculum tali to permit of better dovetailing between the tibia and fibula. In wounds of the posterior part of the foot, partial or complete subperiosteal removal of the calcaneum may be resorted to. In complete removal, care should be taken to preserve the insertion of the Achilles tendon. Occasionally, subastragaloid disarticulation or Syme's or Pirogoff's amputations are indicated. In general, all bony resections of the foot which preserve a good plantar support and a normal axis of the limb are to be preferred to amputations. In some wounds, astragalectomy, with or without removal of a malleolus or a portion of the tibia, has given good results.

Conservative Treatment of Puerperal Eclampsia.—Ross McPherson (*American Journal of Obstetrics*, January, 1918), surveying the mortality statistics of numerous writers, found that in cases treated by radical methods, the maternal mortality approaches an average of twenty-five to thirty per cent., and the fetal mortality, one of forty to fifty per cent. In the last 15,774 cases delivered at the Sloane Maternity Hospital, however, the maternal mortality among eclamptics under a reasonably conservative treatment was reduced to 14.5 per cent., with a corresponding reduction in the stillbirth rate. In the last two years the writer has himself abandoned radical for conservative treatment. Upon entrance to the hospital the eclamptic patient's blood pressure is at once taken, a catheter specimen of urine secured, and the case placed in a darkened and quiet isolation room. Morphine sulphate, 0.5 grain, is then given hypodermically, the stomach washed out, two ounces of castor oil poured down the tube at the end of the lavage, and a colonic irrigation of five gallons of five per cent. glucose solution administered. If the systolic blood pressure exceeds 175 mm. Hg. phlebotomy is carried out and enough blood withdrawn to reduce the pressure to 150. Normal saline solution is not injected. If the pressure is below 175, the patient is not bled, for much blood is likely to be lost during delivery, and the pressure may be so reduced as to cause death from shock. Veratrum viride in large doses is open to the same objection. Subsequently the patient is kept quiet and morphine, 0.25 grain, given every hour until the respirations drop to eight a minute. At this time convulsions have usually ceased, the patient will have fallen into labor, and is usually delivered normally or by an easy low forceps procedure within a short time. A little ether is occasionally required to control convulsions be-

fore the morphine effect asserts itself. Among fifty-five true convulsive toxemias treated by this method only seven mothers died, a gross maternal mortality of 12.7 per cent. Two of these mothers succumbed, however, before treatment of any sort could be administered. Excluding these, the mortality is reduced to approximately nine per cent. Of the children, nineteen were stillborn, a mortality of thirty-four per cent. In no case at term in which a fetal heart was heard on entrance did the morphine, even though used in large quantities, appear to lower the viability of the child.

Treatment of Paraplegia from Cord Injuries.

—A. W. Mayo-Robson (*British Medical Journal*, December 29, 1917) strongly recommends the attempt to suture the severed cord or to restore its continuity by resection of the damaged portion and transplantation into the gap of fresh cord from the rabbit or other animal. Such operations can do no harm when there is already a complete paraplegia and they may be followed by more or less complete restoration of function as shown in a large number of animal experiments and by one recent transplantation of rabbit's cord into a wounded soldier.

Skin Grafting under Septic Conditions.—Paul Bousfield (*British Medical Journal*, December 29, 1917) describes a method by which he has been able to secure successful grafts on wounds which were "clean" but still slightly suppurating. The edges of the wound and the skin whence the grafts were to be taken were sterilized with iodine. The surface of the wound was sprayed with zael, which is a combination of caustic soda, salt and borax. Grafts about a quarter of an inch in diameter and one sixteenth inch thick in the centre were dissected off and laid on the granulating surface, to which each was attached with a fine suture passed through it and the granulation tissue. When the grafting was complete the surface was again sprayed with zael and a dressing of gauze soaked in sterilized liquid paraffin was applied. The area was redressed and sprayed with zael once daily after the first two days.

Care of the Perineum during the Second and Third Stages of Labor.—John P. Gardiner (*Ohio State Journal of Medicine*, February, 1918) concludes that there is little hope of protecting the perineum directly, but indirectly much can be accomplished by: 1, avoiding a too rapid delivery, thus allowing the fascia and muscles time to stretch; 2, allowing the head to pass through in its smallest diameters; 3, allowing favorable delivery of the shoulders. An immediate anatomical repair of the injuries to the pelvic outlet should be made.

Pelvic Infections.—L. G. Bowers (*Ohio State Journal of Medicine*, February, 1918) emphasizes: 1, the letting alone acute gonorrheal pelvic infections without abscess formation, except for the symptomatic medical treatment; 2, the drainage and exploration by finger of the cul de sac abscesses; 3, the drainage of broad ligament tubal abscesses through the abdominal wall by opening into the pus cavity extraperitoneally; 4, occasional drainage in radical abdominal operations through cul de sac by a folded iodoform gauze drain; 5, drain from abscess cavity attached to bladder and abdominal wall should be brought through the abdominal incision.

Miscellany from Home and Foreign Journals

Classification of Diseases of the Heart.—A. Leclercq (*Paris médical*, December 22, 1917) considers obsolete the classification of cardiac affections among elderly subjects into pericarditis, myocarditis, and endocarditis, and lays stress rather on the pathogenesis of the existing condition, regardless of the anatomical portion of the heart involved. He recognizes three heart syndromes, viz., cardio-sclerosis, cardiarteritis, and cardiatheroma. As regards the aorta, often simultaneously involved, the corresponding syndromes are aortic sclerosis, aortitis, and atheroma of the aorta. The first pair of conditions, viz., cardiac and aortic sclerosis, occurs in the fifties, and is due to dietetic errors, with alcohol as an adjuvant, and also to acquired hepatic disease. The myocardium and middle coat of the aorta are chiefly involved. All the viscera are also influenced—viscero-sclerosis—especially the organs of elimination, kidneys, lungs, and liver, which primarily hypertrophy functionally, then undergo atrophy and tend more and more toward sclerosis. Typical, in this condition, are high blood pressure, cardiac hypertrophy, and toxic dyspnea. The natural termination is myocardial failure; the end, however, may be hastened by angina pectoris, pericardial or pleural effusion, acute pulmonary edema, cerebral or meningeal hemorrhage, azotemia, chloruria, or uremic cachexia. The author protests against the tendency to consider such cases nearly all syphilitic. In the second group of cases—cardiarteritis and aortitis, the sole cause is infection, e. g., grippe, measles, scarlatina, typhoid fever, rheumatism, and syphilis. The external and internal coats of the heart and aorta are especially involved, the media being less subject to microbic influences owing to its extreme mobility. Most of the cases are rheumatic or syphilitic, the former involving especially the peri and endocardium and passing insensibly to cardiac insufficiency. The syphilitic involvement becomes more widely distributed, in haphazard fashion, reaching the myocardium, medias-tinum, aorta, and often the nervous system and kidneys, with a correspondingly complex symptomatology. This second group comprises two thirds of the whole of cardiac pathology. The third group—cardiatheroma and aortic atheroma—arises through slow intoxications, as by lead, tobacco, or alcohol, through experimental intoxication, as by epinephrin, or as a senile condition. The intima of the artery is primarily involved, and the resulting atheromatous patches may cause murmurs easily mistaken for those of endocarditis or aortitis. The symptoms are very variable, according to the part or parts of the myocardium, aorta, or renal arteries that may be involved. Complications are less prominent and violent in these cases, and a slow course is followed terminating in heart failure and sudden death, in the absence of painful angina or acute pulmonary edema. The senile heart, the gouty, obese, or diabetic heart, the cases of infarct, thrombosis, or rupture of the heart, and those of aortic thrombosis may all be placed in this group. The prognosis and treatment are constant in each group. In the first,

the prognosis is bad, and the treatment consists in detoxication, with the use of the purin compounds and digitalis. In the second group the prognosis varies according to the causative infection, and the latter requires especial treatment. In the third group the prognosis is based on the toxic state, and the treatment is that of the intoxication, with a simple diet adapted to the reduced functional capacity of the heart and kidneys.

Heart Block in Congenital Heart Disease in Childhood.—Murray H. Bass (*Journal A. M. A.*, February 2, 1918) reports the case of a boy fifteen years old in whom there was some congenital lesion of the heart, along with a condition of heart block with a pulse rate between forty and forty-four beats a minute. The administration of atropine did not remove the block, proving it not due to a toxic factor. Four other cases have been reported in the literature in which heart block has been encountered in association with congenital heart lesions. The commonest cause of heart block in children, however, is the presence of some inflammatory condition. The occurrence of five cases of the condition in direct association with a congenital lesion, together with the general infrequency of heart block in children, suggests that the association is more than mere coincidence. The exact relationship of the cardiac malformation to the heart block is yet unknown.

Auricular Flutter.—J. M. Blackford and F. A. Willis (*Archives of Internal Medicine*, January, 1918) discuss sixteen cases of auricular flutter observed by the Mayo Clinic in thirty months. It is frequently overlooked. Among the authors' cases it was most frequently associated with exophthalmic goitre. In fourteen cases the paroxysmal attacks were dangerous to health and even to life, two patients dying in attacks. The patient with flutter being always in danger of such attacks, prompt treatment is indicated when the disorder is discovered. Auricular flutter is described as an acceleration of the auricles to a rate exceeding 200 a minute, and is detected by electrocardiography. In each of the ten patients in whom proper digitalis treatment could be carried out, the drug broke the auricular flutter. Of these four finally resumed and held a normal rhythm, while the other six were markedly improved subjectively by the onset of fibrillation from the effects of the drug. The importance of adequate dose is emphasized. The authors ran up the dose rapidly to tolerance. The maximum dose was 10.5 mils daily, given for ten days before toxic effects became evident. Better results were noted from pushing the drug to physiologic complete block where the patient could tolerate it to this point, that is, far beyond the point of fibrillation in most instances. In all patients marked poisoning was produced before the drug was discontinued. In the four cured cases the fibrillation repeatedly broke back to a flutter until digitalis poisoning was produced. In cured cases the authors discontinue the digitalis, but in fibrillating cases they advise, by way of aftertreatment,

that digitalis be used if necessary to keep the pulse averaging below 80 during rest. Three patients were subjected to operations under ether with success after fibrillation had been established. In five of the ten treated cases patients have reported complete absence of heart symptoms.

Complement Fixation Test for Gonorrhea.—Martin Krotoszyner (*California State Journal of Medicine*, February, 1918) says that standardized technic and antigens are indispensable prerequisites to rendering laboratory reports upon the complement fixation test for gonorrhea more uniform and reliable. The test is valueless for practical purposes, unless uniform reactions can be obtained in at least eighty per cent. Only strongly positive reactions are of diagnostic significance and may occasionally lead to the detection of a hitherto unsuspected specific focus. A weakly positive or doubtful reaction is in all probability entirely valueless for practical purposes, since an old and noninfectious encapsulated gonococcal focus may produce a strongly positive result, while a matrimonial candidate with an infectious urethroprostatitis may exhibit a weak or negative reaction. He considers it safe to say that the complement fixation test will never assume the importance for gonorrhea that the Wassermann test possesses for syphilis.

Nature of the Wassermann Reaction.—Arthur Vernes (*Presse médicale*, December 13, 1917) notes that experience with the Wassermann reaction has shown it to occur in a manner different from that which Wassermann had originally supposed. Thus, the original extract of syphilitic liver used in the test can be easily replaced by normal liver extract or even extracts of other normal organs, such as the heart or voluntary muscles. In attempting to explain the intimate nature of the reaction, Vernes was led to study the behavior of certain colloidal suspensions in the presence of syphilitic serum. He placed in each of a series of test tubes two mls of a suspension of yellow iron hydroxide, prepared with 0.225 gram of ferric acetate in 250 mls of distilled water. To these tubes he added, from left to right, increasingly smaller amounts of normal human serum diluted with 0.9 per cent. sodium chloride solution up to 0.2 mil. After being kept forty minutes in the incubator, the tubes showed a peculiar alternating action on the suspension, flocculation being nil in the tubes with most serum, complete in tubes with somewhat less, lost again in subsequent tubes, later reappearing again, and finally, in the most dilute tubes prepared, lost anew. Decreasing or increasing the concentration of the hydroxide suspension used caused the curves in the table presenting the results to shift to the right or the left. Substitution of syphilitic for normal serum, in any strength of hydroxide suspension, regularly shifted the flocculation curves to the left as compared to those of normal serum. With appropriate dilutions the reaction can be so ordered as to bring about flocculation with syphilitic serums and absence of flocculation with normal serum. In another article the author will show that by a precise technic syphilitic can be differentiated from normal serums, and also severity of infection, if present, determined.

Tuberculosis of the Eye.—Philip H. Pierson (*California State Journal of Medicine*, February, 1918) emphasizes the following points: 1. The spread of tuberculosis is generally by means of the lymphatics, while the bloodstream transmits the toxins and sometimes the tubercle bacillus. 2. In considering the diagnosis of tuberculosis, careful attention should be given to the lymphatic system, and especially the cervical and bronchial glands as latent foci. 3. The tuberculin test is of great importance; the reaction in the eye should be watched for after each injection and the endeavor should be made to use the smallest dose that will produce a reaction. 4. The treatment should be general as well as with tuberculin.

Cultivation of Tubercle Bacilli from the Circulating Blood in Miliary Tuberculosis.—Mildred C. Clough (*Bulletin of the Johns Hopkins Hospital*, December, 1917) suggested the use of blood cultures as an aid in the differential diagnosis of acute miliary tuberculosis and as a means of studying bacilliemia in all forms of tuberculous disease. When tubercle bacilli cannot be demonstrated by smears, direct cultures from the spinal, pleural, peritoneal, and other fluids are recommended. In the first method Clough used, the blood was added to glycerin broths flasks and after a preliminary incubation the sediment was planted on blood agar slants, which were sealed and incubated. With this method, three positive cultures were obtained. To shorten the time for growth to become visible, a second method was tried, in which the preliminary incubation was not carried out, and the blood was hemolyzed with distilled water and the centrifugalized sediment planted directly on blood agar plates. Three positive cultures were obtained from two patients in twenty-five, thirteen, and seven days. A third method is suggested to reduce the bulk of the sediment by its digestion with antiformin, and hence shorten the time for growth to appear.

Bismuth Iodoform Paraffin Paste in Recent Wounds.—M. L. Emerson (*Journal A. M. A.*, January 12, 1918) records his experience with the use of this paste in more than 2,000 cases of recent wounds seen in civil practice with the occurrence of less than one per cent. of infections. The technic employed is essentially similar to that originally recommended by Morison. Hemorrhage is controlled by pressure on the fresh wound with dry gauze and the occasional twisting off of a small spurting vessel. The skin is then cleansed with a half per cent. solution of iodine in benzene. The wound is laid open, dirt is removed, and the ragged edges are trimmed. The paste is then applied freely to the entire surface of the wound and rubbed thoroughly into the tissues so that everywhere the drug is well imbedded in them. The surplus paste is then wiped away and the skin edges brought together and held until hemorrhage ceases. The use of buried catgut sutures should be avoided and the wound edges should be coated by adhesive plaster strips if they gape widely. In the vast majority of cases treated in this way there is prompt healing by primary union, or a method which is but a slight modification of it.

Effect of Diet on Blood Sugar in Diabetes Mellitus.—H. O. Mosenthal, S. W. Clausen, and A. Hiller (*Archives of Internal Medicine*, January, 1918) found that the highest percentage of blood sugar in diabetics on a carbohydrate-free or moderate carbohydrate diet occurs one or two hours after breakfast. The glycemia is also high after lunch or supper, but may fall considerably in the afternoon and evening hours. In cases in which the blood sugar is high under fasting conditions, the blood sugar tends to remain constant throughout the day on a protein, fat diet; if, on the other hand, the fasting blood sugar is low, having been reduced by previous dietetic treatment, a marked increase in the blood sugar may occur after the taking of even carbohydrate-free food. This leads the authors to conclude that, in raising its fasting blood sugar, the diabetic organism is making an attempt to adjust its carbohydrate metabolism for the more advantageous utilization of glucose. It may be desirable, therefore, not to try to reduce the blood sugar to normal.

Cervical Glandular Enlargement in Children.—E. B. Gunson (*British Journal of Children's Diseases*, October-December, 1917) concludes that glandular enlargement is evidence of an infective process situated in the lymph tissue specifically drained by such glands. In the majority of cases of chronic cervical glandular enlargement the associated infection is simple in nature and quickly responds to proper treatment, the glandular enlargement subsiding as soon as the infective process is removed. Persistent cervical glandular enlargement in the course of scarlet fever was found to be associated with severe constitutional symptoms and complications which included nephritis and arthritis. When chronic cervical glandular enlargement persists in spite of local treatment of the throat the lymph tissue involved—the tonsils—is frequently the seat of a tuberculous lesion, the glands being secondarily infected. Simple chronic glandular enlargement in young children is associated with malnutrition and alimentary and respiratory diseases.

Ureteral Stricture.—Guy L. Hunner, M.D. (*Bulletin of the Johns Hopkins Hospital*, January, 1918), warns against the danger of mistaking tuberculous disease of the ureter for ordinary stricture. In making a diagnosis of ureteral stricture the taking of pyelourethrograms is not necessary, except in a few cases where it is impossible to get by an obstruction in the ureter, and in this instance, if an X-ray catheter with a whistle tip can be passed to the point of obstruction, it is often possible to get the contrast solution to go beyond the obstruction and intensify a stone, if one is present, or outline the character of the obstruction and the condition of the tract above. In men with the unavoidable restriction in the use of instruments, the pyelogram is recommended as one of the best means of diagnosis. A lengthy list of various diagnoses made on the patients is given, whose symptoms were chiefly due to ureteral stricture. In treatment, the ideal method is dilatation from the vesical approach. The types of instruments are described, and certain precautions in technic are given. The advantages of retrograde dilatation are emphasized.

Abdominal Distention in Soldiers.—S. Pisani (*Rivista critica de clinica medica*, October 27, 1917) reports twenty cases of a curious condition found in the Italian army which seems to be a form of hysterical meteorism. These men were in excellent health and all drew attention to the condition themselves. There was a well marked lordosis, the supine posture caused considerable reduction in the abdominal circumference, and anesthesia caused a disappearance of the swelling. The essential causative factor is a tonic inspiratory spasm of the diaphragm, with accompanying segmentary contraction of transverse and external oblique muscles.

Syphilis as a Cause of Diabetes Mellitus.—John R. Williams (*Journal A. M. A.*, February 9, 1918) questions Warthin and Wilson's recent statement that syphilis is a frequent cause of diabetes mellitus, and points out that contrary to their views, the Wassermann reaction is commonly believed to be a trustworthy test of the presence of syphilis. He also shows that a large proportion of severe diabetics have a considerable degree of cholesterinemia, and should, therefore, tend to react specially sensitively to the Wassermann test if syphilitic. On the basis of history and Wassermann reaction, syphilis is not commonly associated with diabetes, and a careful examination of the author's series of 143 diabetics from the point of view of history, suggestive symptoms or lesions, and the Wassermann reaction shows that only four had evidence of syphilis and all of these gave a positive reaction to the Wassermann test. Warthin's contention is not supported by this investigation.

Blood Pressure and Vasomotor Conditions in Cerebrospinal Concussion and Wounds.—Logre and Bouttier (*Presse médicale*, December 20, 1917) state that in the presence of central irritation, as from a meningeal hemorrhage, the pulse pressure and the amplitude of the pulse waves are increased and the diastolic pressure is lowered. Where centres are destroyed, as in brain wounds, on the other hand, the pulse pressure and pulse amplitude are decreased, and the diastolic pressure relatively increased. Concussion leads to a state of vascular instability, with an abnormal variability, spontaneous or induced, in the pulse, blood pressure, and vasomotor activity. These reactions, applying to vascular conditions throughout the body, are of prognostic value. From the standpoint of unilateral changes, localized destructive or irritative lesions were observed to cause asymmetric arterial modifications, especially in the presence of Jacksonian symptoms. In concussion affecting principally one side, a rather definite symptom group exists, viz., 1, motor and sensory disturbances, such as exaggeration of reflexes and hyperesthesia, slight but asymmetric; 2, principally unilateral electric reactions; 3, a lumbar puncture showing the condition to be organic, i. e., revealing a lymphocytosis and, especially, an albuminosis; 4, lack of vascular equilibrium of the hemiplegic type, best shown experimentally by Josué and Pailard's procedure of applying ice to the bend of the elbow and by the heating test, the affected side showing a much greater variability of the pulse pressure and amplitude than the normal side.

Proceedings of National and Local Societies

THE NEW YORK NEUROLOGICAL SOCIETY.

Regular Meeting, Held May 1, 1917.

The President, Dr. FREDERICK TILNEY, in the Chair.

(Concluded from page 479.)

The Acute Phase of Anterior Poliomyelitis.—

Dr. GEORGE DRAPER, of New York, summarized his observations on the importance of the symptoms presented by slightly ill children during an epidemic. Three hundred or more on Long Island last summer were studied. The apparent fluctuation in virulence of the virus in different localities and periods, the wide range of susceptibility and the peculiar sequence of events in the clinical course of the disease itself contributed to the difficulty of early diagnosis which was very important in view of the necessity of preventing the establishment of damaging lesions in the cerebrospinal nerve tissue. As paralysis was the only known undesirable result of recovered cases of acute poliomyelitis, it was necessary that therapeutic effort should be directed to prevent this.

The untreated cases were arranged in three groups according to the clinical course. Group I showed the curious phenomenon of two different periods of illness with an interval of wellbeing. In Group II this period of comparative wellbeing was not present, but there was a sustained period of indisposition of varying intensity. In Group III only did all the signs point from the start to meningeal and nervous involvement. One physical sign of great importance was the spine sign. It depended on the fact that in acute poliomyelitis any manipulation which brought about anterior bending of the spine caused pain and was therefore resisted.

In groups I and II a picture of general systemic infection developed from which the patient appeared to recover completely or in part and then to receive a second blow directly on the cerebrospinal tract. The so called abortive cases were in all probability examples of the disease in which the first period in Group I constituted the entire course of the malady, the meningeal stage either never occurring or, if it did, in so slight a form as to pass unrecognized. The term "abortive" gave a wrong impression; it would be better to speak of acute poliomyelitis, with or without paralysis. Early repeated lumbar puncture was of diagnostic value; the tendency of the patients with the higher cell counts in the early hours was toward paralysis. After thirty-six hours, the cell count in the spinal fluid was of little or no prognostic value. The evolution of the disease was rapid and its course must be considered in terms of hours, not days.

Dr. H. L. AMOSS referred to Doctor Bull's description of the streptococcus which he obtained from the cerebrospinal fluid; the virus of poliomyelitis, however, had not been detected in the cerebrospinal fluid. It had not been possible at the Rockefeller Institute to duplicate Doctor Rosenow's experiment in bringing about the transmutation of

streptococci into globoid bodies. Doctor Bull recently observed the persistence of streptococci in a rabbit's brain for 131 days. It had been reported that rabbits had been infected with poliomyelitis, but the pathological condition was new and not yet understood. Upon injecting poliomyelitis virus into a rabbit's brain, sacrificing the animal at the end of seven days and thereupon injecting the material obtained from the site of inoculation into a monkey, the monkey remained well. If the material was taken after only four days, however, the poliomyelitis virus was found to persist and was infectious for the monkey. In July, 1916, in Westchester County, a limited number of cases of poliomyelitis were treated with serum. There were few fundamental facts on which to base this treatment. It was known that a second infection of poliomyelitis was rare, and that monkeys were not susceptible to second injections of virus after they had once responded. Many years ago, Flexner and Lewis conducted experiments on the treatment of experimental poliomyelitis. They injected monkeys with poliomyelitic virus and treated them with serum obtained from paralyzed monkeys. At that time they experienced difficulty in obtaining results, owing to the fact that poliomyelitis for monkeys is a severe infection producing a mortality of almost 100 per cent. In some animals, however, they were able to delay the infection and in others could prevent paralysis. Later, Netter and Salanier applied this method of treatment to human beings. They injected serum from recovered cases intraspinally in thirty-two patients. Their results indicated clearly that at least no harm was done.

In poliomyelitis the tissues affected were difficult of access and it was not easy to bring sufficient serum into the interstices of the spinal cord, although the permeability of the cord was probably increased by the inflammatory process. In employing the serum treatment, it was considered desirable to give injections as early as possible in the disease, and in large doses. As the amount of serum obtainable was limited, mixed serum secured from several recently recovered human cases was used, the purpose being to obtain an optimum percentage of immune bodies. The cases for treatment were selected, not on the basis of the severity of the disease, but according to the stage of illness, early cases being chosen. Unpreserved, inactivated serum, free from hemoglobin and fat, was used. The serum was kept for ninety-six hours prior to injection and was tested bacteriologically. In all, twenty-six patients received the serum treatment. Twelve showing simple paralysis before the injections, fourteen had no paralysis at the beginning. Of the fourteen cases, two died of respiratory paralysis and in two the paralysis increased. Ten showed no increase in the paralysis but, on the contrary, immediate improvement. Of the twelve patients in whom serum was given under optimum conditions, eleven exhibited immediately a drop in temperature and improvement in the paralysis and clinical condition.

The serum was not injected by the intraspinal route alone, because a sufficient amount could not be given in this manner, and the object was to give as large doses as possible. The average dose was twenty c. c. given intraspinally, after the removal of a larger amount of spinal fluid; the remainder of thirty c. c. was given intravenously and subcutaneously. The larger the amount of serum and the earlier it was given, the better were the results. The serum was not administered unless the patient was in the febrile stage. The intraspinal injection of any serum results in a disturbance of the normal adjustment represented by the choroid plexus, and makes itself known by increased permeability. There is also a polymorphonuclear reaction. However, the injection of serum from recently recovered cases more than compensates for the disturbances thus brought about.

The following conclusions were drawn from the experience of these twenty-six cases: 1. When serum was used from recently recovered cases of poliomyelitis and injected early in the course of the disease, the treatment had no disadvantages. 2. The action of the serum appeared to be more potent in arresting the paralysis than in bringing about retrogression. 3. The problem of multiple injections had not been completely solved, but it might be said that large amounts of the serum should be given at first. If these were not effective in lowering the temperature curve, the dose should be repeated. 4. As much serum as possible should be given intraspinally and the remainder subcutaneously. 5. Patients over three years of age should receive at least 50 c. c. serum from recently recovered cases. If serum from more remotely recovered cases was used, correspondingly large amounts should be employed.

Dr. I. STRAUSS, referring to Doctor Draper's chart, asked if it was to be inferred that some of the cases recovered at the end of the first phase. If that were so, looking at the symptoms one would be entitled to question the diagnosis. No symptom on the first part of that chart was a symptom one could consider characteristic of poliomyelitis. In an epidemic one was justified in suspecting such a case to have the disease, but with no increase cells in the cerebrospinal fluid there was not sufficient data for a diagnosis. If they went on to the second phase and there was additional evidence of increase of the cellular content in the spinal fluid, then there was no doubt as to the nature of the disease.

Regarding Doctor Bull's paper, the speaker wished to say that when this work on streptococcus findings first began, the neurologists who read the reports must have felt that they were dealing with a psychological complex, and that the individuals doing the work required some form of psychoanalysis. Scientists, as well as other people, were subject to the influences of psychic complexes, and this whole school with Rosenow at the head, followed by Mathers and Nuzum, seemed to be possessed with one idea, namely, the streptococcus complex. Studying the reports of this school, one would find that the streptococcus had been declared the etiologic factor in diseases ranging from ovarian cyst to

goitre, to ulcer of the stomach, and now to poliomyelitis. It was strange that the specific streptococcus should have escaped the bacteriologists of the New York group. It was not discovered until there was a transmutation of the Chicago group to New York. Furthermore, although the Board of Health laboratory cultured one thousand specimens of cerebrospinal fluid, the streptococcus could not be found. At Mount Sinai they had done this repeatedly and the streptococcus was not found. It was interesting to note that the virus of poliomyelitis was not found in the spinal fluid by any investigator until the Chicago school began their study. Neither did blood contain it. Who, having seen streptococcus infection in a human being, or a streptococcal meningitis, had failed to find the streptococcus in the spinal fluid or in the blood? Doctor Bull's work suggested that a theory was generally wrong until it had been proved by making controls constantly and repeatedly as Doctor Bull had done.

Regarding the treatment, Doctor Amoss recognized the great difficulty under which he was laboring in attempting to make deductions from the few cases he had had. The speaker could show him reports of untreated cases at Mount Sinai in which the temperature fell by crisis. No matter what treatment was used, whether adrenalin or serum, the same results would be shown in another child who had not been treated. That was the difficulty in valuing any form of treatment until a remedy was found which acted as a specific remedy did in other diseases. The speaker noted what Doctor Amoss said about the physiology of the spinal fluid. Neurologists knew that the spinal treatment of syphilis had its origin at the Rockefeller Institute, and there was analogy between syphilis and poliomyelitis in that the virus of both was in the cord and brain; but if he admitted that one could not treat poliomyelitis by intraspinal injections alone, it was just as illogical to thus try to treat syphilis.

Dr. HERMAN SCHWARZ said that he had treated twenty-one cases last summer with convalescent serum which was obtained from people who had had the disease a few months to four years previously. The cases were divided into what he called the cerebral type, the main symptoms being rigidity of the neck and increased reflexes, and the spinal type, where the reflexes were diminished. The number of these cases was not sufficient to warrant a definite statement concerning the value of the serum. It was used only intraspinally, repeated injections being given every twelve to twenty-four hours, as much as sixty c. c. altogether in some cases. The general impression was that serum had very little influence upon the extension of the disease in the cerebrospinal system and therefore in the limitation of paralysis or the prevention of bulbar symptoms. All those who were given serum and did not show paralysis were cases of the cerebral type. The use of serum was certainly indicated until something was proved to be more efficacious. It had done no harm and many observers believed it to be of considerable value.

Regarding diagnosis and prognosis, spinal puncture was most helpful in the early stages, as Doctor

Draper said. Increased number of cells and increased globulin usually pointed to a poliomyelitis when combined with a clinical picture of an acute infectious disease. The cell count did not appear to have any great value as an index to either recovery or death, paralysis or no paralysis. Polymorphonuclears associated with or without a high mononuclear count seemed to point to a more favorable prognosis. In the early stages of the disease there was at present no real diagnostic clinical sign, for during the epidemic many cases started just like any other infectious disease, such as grippé, measles, or tonsillitis, would begin.

THE AMERICAN PROCTOLOGIC SOCIETY.

*Nineteenth Annual Meeting, Held at New York,
June 1-5, 1917.*

The President, Dr. JEROME LYNCH, in the Chair.

The Place of the Proctologist in a Diagnostic Group.—Dr. ALFRED J. ZOBEL, of San Francisco, stated that the charter members of the American Proctologic Society were the pioneer teachers and practitioners of modern proctology. Through the efforts of the fellows of the society proctology has received recognition as a specialty both from the American Medical Association and the American College of Surgeons. Attention was again called to the fact that but few of the undergraduate medical schools gave adequate instruction in enteroproctology by qualified men. In sharp contrast to this, it was noted that in every postgraduate medical school in the country there was a department of rectal and colonic surgery, whose existence was amply justified not only by the number of patients which it treated, but by the large attendance of postgraduate students. It was urged that the undergraduate medical schools, particularly those attached to universities, should take heed of the demands and needs of modern medicine, and that they should begin to realize that failure to impart instruction in enteroproctology and in the other recognized specialties which had arisen in late years, impaired their standing as thorough teaching institutions.

With more knowledge and longer experience the specialist better realized the close relationship between his particular field and all the other parts of the body. He further learned that while he excelled in his own special work, as a result of devoting his entire attention to it, he lacked knowledge, experience, and adeptness in that of others. As a result, among progressive men a movement had arisen lately to form what was known as diagnostic groups. Group diagnosis was not a new idea. It had been used for years in the postgraduate schools, which were the only institutions possessing a staff of clinicians in every specialty of medicine and surgery. The present movement was simply an elaboration and an extension of the original idea. Every diagnostic group should include specialists in every branch of medicine and surgery. In it should be an enteroproctologist with sufficient training and experience to warrant the interpretation of his findings being considered of value.

The fellows of the American Proctologic Society

have repeatedly urged the necessity for cooperation with the internist surgeon and other specialists. They had again and again pointed out that anal, rectal, and colonic lesions often gave rise reflexly to symptoms which might be wrongly attributed to disease in other parts of the body, and vice versa. This was especially true with regard to the reproductive and urinary organs. Therefore, in the consideration of cases representing symptoms in these parts, it was equally important to secure the opinions of the gynecologist, urologist, and proctologist before a correct and final diagnosis could be deduced. The high class men among the various specialists of medicine and surgery knew best the value of, and insisted upon, the need for anorectocolonic examinations. They understood best that through long and varied experience, skill in the use of the illuminated pneumatic sigmoidoscope, and ability to interpret correctly what was seen, the enteroproctologist should be relied upon to do this part in the diagnostic scheme.

The laity were now quick to take cognizance of the neglect of their medical adviser to secure for them an expert examination of the rectum and colon. Every diagnostic group should include a competent proctologist.

Adult Rectal Prolapse.—Dr. RALPH W. JACKSON, of Fall River, Mass., said that too few papers had appeared on the major types of rectal prolapse. The subject deserved more attention. Two sharply contrasting cases brought out the writer's views on the therapy. The first patient was operated on four times as follows: extensive regional cauterization resulting in recurrence; posterior rectopexy resulting in recurrence; amputation, resulting satisfactorily as regards anal prolapse, but leaving a very large posterior vaginal hernia, which was promptly cured by cul de sac closure with sigmoid uteroventral wall suspension. The second, and less favorable, case was promptly cured by one operation identical with the final operation in the first case. The pelvic floor as a support depended on the sufficiency of four factors. The pelvic fascia was variable in strength and attachments, affecting the depth of the peritoneal cul de sac. The strength of the levators and their uplift was not a constant thing. The anal and vaginal orifices might be guarded by sphincters, perivulvar muscles, a perineum and levators which are imperfect through trauma or atrophy. Adipose padding about these structures was essential but often lacking. The rectum had imperfect support above the pelvic floor and its anterior wall none at all. Prolapse began here from external pressure, or began below as anal protrusion, but eventually the prolapse contained a hernial cul de sac. Regional cauterization was inadequate to meet any such faults. Posterior rectopexy did not support the primarily offending part. Amputation removed the troublesome part, but did not correct the faulty factors which might allow recurrence *per anum* or *per vaginam*. Cul de sac closure, though a difficult operation, went far toward such correction, and suspension helped. The writer would conclude that the operation of first choice for these very troublesome prolapses was cul de sac closure through the abdomen, plus some form of

suspension, to be followed and supplemented, if need be, later by amputation or perhaps some plastic work on the elements of the pelvic floor.

Relation of Hemorrhoidal Disease to the Health Balance.—Dr. WILLIAM M. BEACH, of Pittsburgh, Pa., summed up as follows: 1. Hemorrhoidal disease had a deleterious effect upon the patient's mind which increased his irritability and made him anxious and morose. 2. Many reflexes were coincident with ulcerated large or small type of hemorrhoids. 3. Hemorrhoidal diseases influenced the so called vegetative functions of the body and were intimately associated with diseases of the heart, lungs, liver, and kidneys. 4. There was a refractory or retroactive relationship in most cases of constipation. 5. Neglected cases tended toward infections and cancer.

Principles Underlying the Clamp and Operation for Internal Hemorrhoids.—Dr. W. OAKLEY HERMAN, of Philadelphia, Pa., stated that the purposes of this form of operation were: 1, to remove actual piles, or pathology, and, 2, to support relaxed pile bearing tissue and mucous membrane. After giving minute details as to his technic he insisted that only just enough tissue be removed to care for the pathology, being sure that columns of mucosa and skin be left between the eschars, thus preventing any undue contraction of the rectal outlet. Unless the tissue included in the clamp was excessive it was not cut off but was destroyed by the careful application of the cautery. Care was taken that multiple strips of wet gauze were placed under the clamp to prevent undue radiation of heat to the surrounding tissues. Careful placing of the clamp, thorough cooking of the included tissue combined with the crushing produced by the clamp was depended upon to prevent such a complication as hemorrhage. After all danger of secondary hemorrhage had passed, the insertion of a gloved finger would overcome the tendency to contraction.

Pruritus Ani.—Dr. DWIGHT H. MURRAY, of Syracuse, N. Y., read his seventh annual report on original research work in pruritus ani. He did not continue to report the work in great detail because so many men in the profession, were uniformly reporting a confirmation of his claims for the etiology being *Streptococcus fecalis*. He was working for the perfection of a standard stock vaccine that could be used by any one without the trouble to make cultures. He had used some of this stock of polyvalent strain from eight successfully treated patients, and the patients treated seemed to improve. He had used it only one month, so full judgment must be suspended. During the past year he found the patients all getting worse at about the same time, and finally found a laboratory worker deceiving him as to the strength and kind of vaccine; any kind of bacteria was used, and few, if any, *Streptococcus fecalis*. On getting the work in the hands of a proper man all went well.

Doctor Murray reported that the work of the past year had still more strongly proved the correctness of the bacterial—*Streptococcus fecalis*—infection theory as the etiology. His conclusions of the work were: 1. Conclusions of former years were confirmed and most of them were strength-

ened by experience of the past year. 2. The troubles he had had with the laboratory worker gave proof that the benefit received by patients, following the use of *Streptococcus fecalis* vaccine, was not a coincident. 3. There was increasing proof that if rectal pathology was present with streptococcal infection of the anal skin, an operation would not cure the pruritus ani. 4. There was increasing proof that if rectal pathology was present without a streptococcal infection of the anal skin, an operation would cure the pruritus ani. 5. There was continued proof that staphylococcus or *Bacillus coli* might complicate infections of the anal skin in pruritus ani. 6. Having published six years of research work, taking into account the report of physicians in this country and abroad who had confirmed his findings as to the skin infection, he felt justified in now asserting that the etiology of pruritus ani was a skin infection and that *Streptococcus fecalis* was the usual bacterium.

(To be continued.)

Book Reviews.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

A Clinical Treatise on Diseases of the Heart. For the General Practitioner. By EDWARD E. CORNWALL, Ph. B., M. D., Attending Physician, Williamsburgh and Norwegian Hospitals; Consulting Physician, Bethany Deaconesses Hospital; Formerly Professor of Medicine, Brooklyn Post-Graduate Medical School, etc. New York: Rebman Company, 1917. Pp. 127. (Price \$1.50.)

In his preface the author says that this book is neither an exhaustive treatise nor a digest or compendium, but that it deals in a practical way with some of the more important matters in the diagnosis and treatment of diseases of the heart. We agree with these statements, for the book is essentially practical from cover to cover and has many good points to recommend it and very few to be brought up against it. Among its best points we should like to mention specially the very practical and extremely lucid and common sense discussion of the general diagnostics of heart diseases, the clear and rational remarks on the significance of blood pressure findings in heart disease, and the total omission of the technical methods which prove so confusing to a large proportion of general practitioners, however valuable they may be to the specialist and the student. The diagnostic procedures can all be applied without special apparatus by any physician, but they put upon him the just burden of accurate observation and careful interpretation of his findings. There are so many other good points in this book that we cannot mention more of them, but they can all be summed up in the statement that they make for facility and ease in diagnosis without sacrificing accuracy. The one weak point which deserves mention is the author's misconception of several points in the pharmacology of digitalis and strophanthus, the latter drug coming in for unmerited praise in view of the great uncertainty of its absorption from the alimentary canal. Some of the features not well understood are the influence, or rather lack of direct influence, of digitalis and strophanthus on the blood pressures, the poor and irregular absorption of strophanthus and strophanthin, and the mechanism by which both digitalis and strophanthus produce nausea and vomiting. In spite of the fact that the author is somewhat weak in his pharmacological knowledge of these two drugs, his empirical use of them is exceedingly good with the single exception of his high recommendation of strophanthus and strophanthin for oral administration. We mention these facts not so much in criticism of the author as to point out to him wherein he can improve sub-

sequent editions of his valuable work. In this connection we would urge him to give careful study to some of the more recent work on these drugs which has been done by American investigators. In spite of this mention of his one chief weakness we wish to commend the work in the highest terms as one specially suited to the needs of the general practitioner who sees and treats many cardiac cases and whose management of them still leaves much to be desired. Were he to make this book his guide he would fall into error far less often than he does now and there would be fewer absurdities of statement found in his casual writings than is now the case.

Elements of Field Hygiene and Sanitation. By JOSEPH H. FORD, B. S., A. M., M. C., Colonel, Medical Corps, U. S. Army. Approved for Publication by the Surgeon General, U. S. Army. With 152 Illustrations. Philadelphia: P. Blakiston's Son & Co, 1917. Pp. xii-248. (Price \$1.25.)

Hygiene and sanitation have played a greater part in this than in any previous war. The results of sanitation and personal hygiene properly applied have been conclusively demonstrated on the French front, and the consequent saving of life has been enormous. In order that such methods may be practised in the most effective way, it is essential that army officers should be well instructed in the principles. Colonel Ford, in his little book, has laid down the elements of field hygiene in concise, clear language, and there is no doubt that it will serve as a valuable guide to newly commissioned officers. The illustrations and diagrams add admirably in elucidating the text.

Surgical Nursing in War. By ELIZABETH R. BUNDY, M. D., Member of the Medical Staff, Woman's Hospital, Philadelphia; Formerly Adjunct Professor of, and Demonstrator of, Anatomy, Women's Medical College, Philadelphia; Formerly Superintendent of Connecticut Training School for Nurses, New Haven, etc. With 37 illustrations. Philadelphia: P. Blakiston's Son & Co, 1917. Pp. viii-184. (Price \$0.75.)

A large number of American women will be required to nurse and care for the wounded in Europe and, to a lesser extent, in this country. In order to fill the position of a military nurse, so that the wounded may receive the best care and attention, for after all good nursing is as important as good surgery, the nurse must be adequately trained. Doctor Bundy, in the book before us, has collected and compiled from the surgical literature of the war the most salient points bearing upon nursing. In addition, useful suggestions are included which have been received from those who have been personally in service at the front. The book should well fulfill the purpose for which it was written, a textbook for ready reference by those who contemplate joining the nursing corps of the military hospitals or those who have already done so.

Manual of Medicine. By THOMAS KIRKPATRICK MONRO, M. A., M. D., Fellow of the Royal Faculty of Physicians and Surgeons, Glasgow; Regius Professor of Practice of Medicine in the University of Glasgow, and Physician to the Western Infirmary. Fourth Edition. St. Louis: C. V. Mosby Company, 1917. Pp. xxiv-1045.

This fourth edition has been thoroughly revised and brought well down to date by the inclusion of some of the newer diseases and the reclassification of others as their etiology has become more certainly established. Like a large proportion of British textbooks, this one is well written and should prove relatively easy for the student to follow, although the discussion of the individual diseases is often rather briefer than might be wished for. There is one aspect of the subject in which the book is lamentably weak, namely, that of the treatment of the diseases, and it would have been far better if the author had omitted this topic entirely. The work is comprehensive and includes not only the strictly medical diseases, but also a long section on neurology and a considerable discussion of skin diseases. Both of these fields are of interest to the physician, but we think that the book would have been improved had they been largely omitted, or reduced to the merest outline, leaving, thereby, more space for the inclusion of some of the rarer manifestations and complications of the commoner diseases. In spite of these defects the book is altogether a very good one and might properly be given a place among textbooks of medicine similar to that held among surgical texts by the well known manual by Rose and Carless.

The Examination of Milk for Public Health Purposes. By JOSEPH RACE, F. I. C., City Bacteriologist and Food Examiner, Ottawa; Chairman of Committee on Standard Methods of Analysis, Canadian Public Health Association; Member of Committee on Municipal Food Administration, American Public Health Association. First Edition. New York: John Wiley & Sons, Inc., 1918. Pp. vi-224.

Milk is so important an article of food that it is manifestly essential from the standpoint of public health that it should be as pure as possible and especially that it should contain no germs of disease. The bacteriological examination of milk is now deemed absolutely necessary, and when the fact is taken into consideration that milk is a fertile medium for many deadly bacteria and that infectious diseases are not infrequently spread by means of milk, it is obvious that examination should be strictly enforced. Doctor Race's book deals with the examination of milk in a thorough manner. With regard to the effect of pasteurization on the bacteria of milk, interesting data are given but no reference is made to the Budde process, in which the milk, after the addition of hydrogen peroxide, is heated for three hours to 52-53° C. The milk question, from the standpoint of chemical and bacteriological examination, is amply discussed, and the book is well adapted for the use of public health milk examiners and as a textbook for students grounded in the fundamentals of bacteriology.

Births, Marriages, and Deaths.

Born

ROBERTSON.—In Brooklyn, N. Y., on Monday, March 4th to Lieutenant Ransom Smith Robertson, M. C. N. G. U. S. A., and Mrs. Robertson, a son.

Died

BAKER.—In Philadelphia, Pa., on Sunday, February 17th. Dr. Anthony George Baker, aged sixty-nine years.

RIDDLE.—In Topeka, Kan., on Saturday, February 16th. Dr. Thomas C. Riddle, aged sixty years.

BUTCHER.—In Philadelphia, Pa., on Friday, February 22d. Dr. Alexander Cooke Butcher, First Lieutenant, Medical Reserve Corps, U. S. Army.

CRONYN.—In Milwaukee, Wis., on Wednesday, February 20th. Dr. William J. Cronyn, aged sixty-nine years.

DIFHL.—In Buffalo, N. Y., on Wednesday, February 20th. Dr. Conrad Biehl, aged seventy-four years.

EUSTACE.—In Phoenix, Ariz., on Tuesday, February 19th. Dr. Arthur Barrett Eustace, of Chicago, Ill., aged thirty-two years.

GALLISON.—In Franklin, Mass., on Friday, February 15th. Dr. Ambrose J. Gallison, aged sixty-two years.

HEIM.—In Buffalo, N. Y., on Saturday, February 16th. Dr. Edward W. Heim, aged forty years.

KENDRICK.—In Atlanta, Ga., on Friday, February 22d. Dr. William Scott Kendrick, aged seventy-five years.

McMANAWAY.—In Charlotte, N. C., on Friday, February 15th. Dr. Charles Gustavus McManaway, aged sixty years.

NEWTON.—In Seattle, Wash., on Thursday, February 14th. Dr. LeRoy Allan Newton, aged fifty-four years.

NORMAN.—In Eureka, Kan., on Monday, February 18th. Dr. Edward J. Norman, aged forty-four years.

ORDEN.—In Grafton, W. Va., on Saturday, February 16th. Dr. George R. Orden, aged fifty-three years.

PRATHER.—In Seale, Ala., on Tuesday, February 19th. Dr. William Butler Prather, aged seventy-one years.

RICHMAN.—In Newark, N. J., on Saturday, March 2d. Dr. Edward Milton Richman, aged forty-five years.

STEELE.—In Norfolk, Va., on Friday, February 15th. Dr. James G. Kiddick, aged fifty-six years.

ROSE.—In Fayetteville, N. C., on Friday, February 15th. Dr. Augustus Steele Rose, aged forty-five years.

SHEEHAN.—In Spring Valley, N. Y., on Thursday, February 21st. Dr. Daniel Joseph Sheehan, aged fifty-seven years.

STEHMAN.—In Pasadena, Cal., on Saturday, February 16th. Dr. Henry B. Stehman, aged sixty-six years.

TAYLOR.—In Thomasville, Ga., on Saturday, February 16th. Dr. Augustus P. Taylor, aged sixty-eight years.

WHELAN.—In Youngstown, O., on Tuesday, February 19th. Dr. William J. Whelan, aged seventy-four years.

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WHOLE No. 2051.

Original Communications

A NAUHEIM METHOD.

Its Chemistry; Physiological Action; Dynamic Application, Including Technic, Rationale, Indications, Contraindications, and Accessory Measures in Treating the Commoner Cardiovascular Disorders.

By N. PHILIP NORMAN, M. D.,
Watkins, N. Y.,

Formerly Resident Physician, 3rd Division, New York Neurological Institute; Physician to the Glen Springs.

When I first began using the Nauheim therapy for conditions which will hereinafter be described, I was struck with the meagreness of definite information contained in the majority of articles published. Some authors gave an elaborate historical sketch of the evolution of this therapeutic measure, crediting to each of the eminent physicians connected with the embellishments of this method their contributions. Others cited case reports with discussions confined to these cases and some others merely gave generalizations on the subject. A few were inclined to discuss the relative merits of the artificial bath as compared with the natural bath. Practically all the technical information came from European investigators and one American investigator. A notable fact is that all the men who have had practical experience with this method were very enthusiastic over their results. A few who had apparently had but little experience, were inclined to be neutral or to disparage it. My conclusion was that the way to gain a clear insight into the value of this treatment was by carefully examining patients, individualizing their treatments, noting immediate effects and as far as possible keeping in touch with patients after leaving, preferably through their home physician. The conclusions that I shall elaborate in this paper have, in a great measure, been drawn from practical experience and study of the indications, contraindications, rationale and technic of this method of therapy that I have used for the past four years. I shall attempt to define comprehensively and concisely all that has been incorporated within the title of this article. Some of these conceptions may be at variance with those of other physicians, but this is not to be wondered at, for each physician strives to develop a rationale and technic which success and failure have demonstrated as serving him best. This

is as true of this form of therapy as it is of other forms of therapy. The individual equation of the physician plays as important a part in making this therapy formidable as it does in other conditions that require drug therapy, and the psychical side of our patients must always be studied if we make a thorough investigation.

Some of the reasons that may be considered as fundamental for the divergence of opinions among medical men as to the efficacy and inefficacy of Nauheim therapy are prejudice, since this method has been exploited for commercial reasons alone by physicians and laymen; the dissension among hydrotherapists as to the indications, contraindications, rationale, and technic of the method which produced misconception and skepticism among the profession; and disagreement as to the chemical constituents and the relative merits of the artificial bath as compared with the natural bath, which in this country served to inhibit our interest appreciably in the merits of our own spas. As to commercial exploitation of the method, it is only necessary to say that such institutions and physicians are soon found out and receive the just condemnation of the profession with inevitable financial embarrassment. Reputable methods and honest physicians should not be made to suffer and patients deprived of the benefits of treatment because of a prejudice engendered by a few unworthies. As to the difference of opinion concerning the *modus operandi* and rationale in each reputable spa a method is developed which is best suited to its natural resources, geographical location, environment, and the social class to which it caters. The correct determination of indications, contraindications, rationale, and technic as practised at these spas is obviously directly proportional to the amount of experience and training of the medical men connected with the institution. In comparing the advantages and disadvantages of the artificial bath with the natural bath, Schott himself believed that, all things being equal, there was little advantage in the natural bath. The advantage of the natural bath is that it contains other mineral constituents than chloride of calcium and chloride of sodium, and, if radioactive, it obviously would seriously handicap the artificial brine. Carbonation by artificial means standardizes in a uniform manner the volume of CO₂ for each series, whereas naturally charged waters vary as to volumetric content and cannot be corrected or uniformly standardized

for the various series. At the Glen Springs the medical staff has been developing this method of therapy for twenty-eight years. At present the method is standardized and while the three physicians practise independently and vary the technic to meet individual requirements, they at all times standardize the essentials.

Since the beginning of the war, I have had occasion to treat many Nauheim devotees and it was interesting to note the similarity of bath prescriptions for patients with varying ailments but practically all were satisfied with their investment. It follows that the patient's psychical processes must be given credit for some of this benefit and no doubt in many cases harmful effects were neutralized or were changed to beneficial effects. The ocean voyage, rest, and diet must also be recognized as potent factors in reported benefits. Despite all these probabilities the success and popularity of Nauheim is obvious evidence that the method is substantial and is producing results. Unfortunately, psychical stimulation is never as intense in patients visiting native spas as it is in patients visiting foreign spas. The mode of transportation is not as novel as in going abroad, and one can never completely sever business or domestic relations while at a native spa. Environment has not changed as much as in a foreign country. Native spas have advantages that offset these psychical benefits. In a great many cases it is inadvisable to send patients abroad. The sometimes strenuous seasick gymnastics of a poor sailor are not beneficial to an overloaded heart and more than one unfortunate ship's doctor has had to prescribe cardiac stimulants and antiseasick remedies in trying to give a once hopeful patient some degree of comfort. In many patients who have benefited from their baths, compensation is destroyed on the return trip and they arrive home just in time to collapse. Others after a successful course go to the gay centres of Europe instead of taking an aftercure and in a week's time are fit subjects for another cure. Some unfortunately succumb at the spa and anyone who knows anything of Nauheim knows the methods pursued under such circumstances. In native spas these disadvantages are eliminated and patients will take the aftercure even though they return home and rest as directed. If feeling well enough they return to business and by leading a regular life get along very well. It stands to reason that for American spas to be successfully competitive with European spas they must be relatively more efficient. A few American resorts have been successful. Only two resorts in this country have, so to speak, specialized in Nauheim therapy. These two only have natural resources which fit them for this work. The Glen Springs at Watkins, N. Y., has a natural, highly radioactive brine loaded with the principal constituents for the bath that I shall describe later. Saratoga Springs is famous for its charged waters. For proof, the efficiency of the Glen Springs method one needs but to review its growth.

CHEMISTRY.

The Glen Springs brine is a natural brine obtained from an artesian well 1,500 feet deep, usu-

ally perfectly clear, colorless, odorless, and with a strong saline taste. Bubbles of gas of varying size are noted. It is pumped to reservoirs and piped to the bathrooms. A dark gray precipitate with a yellowish tinge is observed after the brine has stood for a while. Twenty-four hours later a dirty brown flocculent sediment with black particles settles at the bottom of the vessel and gives to the supernatant fluid a cloudy appearance. This brine is neutral to litmus, congo red, and phenolphthalein, and has a specific gravity at 60° F. of 1.333. The analysis of this brine by Professor E. M. Chamot, of Cornell University, shows the following:

	Grams per litre
Total solids	213.8
Loss on ignition	38.6
Silica	0.79
Oxides of iron and aluminum	0.03
Calcium (Ca)	14.9
Barium (Ba)	0.03
Magnesium (Mg)	4.2
Nitrogen (N ₂) as NH ₃	0.82
Potassium (K)	0.008
Lithium	Trace
Chlorine	111.9
Carbonic acid (CO ₂) half bound	0.01
Carbonic acid (CO ₂) free	0.17
Sulphuric acid (SO ₂)	Trace

These constituents are in my opinion combined as follows:

	Grams per litre	Grams per U. S. gallons
Total solid residue	213.8	12.100
Organic and volatile matter	38.6	2.238
Colloidal matter	0.8	.46
Calcium chloride	41.2	2.489
Magnesium chloride	16.3	.945
Barium chloride	0.025	.1
Barium bicarbonate	0.050	.30
Ammonium chloride	3.2	185.6
Sodium chloride	120.0	6,960
Potassium chloride	0.015	.8
Lithium chloride	Trace	Trace
Sulphates	Trace	Trace
Carbon dioxide in solution	0.17	9.0

The radioactivity of this water was determined by Professor J. S. Shearer, of Cornell University, and his report is reprinted only as concerning this brine and not including the drinking springs:

DEPARTMENT OF PHYSICS,
CORNELL UNIVERSITY,
ITHACA, N. Y.

July 15, 1915

PRELIMINARY.

The radioactive properties of spring waters are generally due to a gas derived from the decomposition of radium in the earth or strata through which the water has passed. Sometimes there is an actual solution of radioactive salts in the water. The active gas is known as the radium emanation and it may be driven out of the water by boiling. When the water is removed from the radioactive material and does not carry the salt in solution, the dissolved emanation loses its activity at a known rate. The same is true of the emanation when removed from the water. If radium is present in the water there is a continuous decay as above but also a continuous development, thus maintaining a fixed condition.

The rate of decay is such that when there is no supply the activity reduces to fifty per cent. of the initial value in 3.85 days to twenty-five per cent. in 7.7, so that in twenty-five days only one per cent. remains, and in thirty days 0.5 per cent. The rate of development is equal to the decay so that a solution of radium from which all emanation has been expelled will completely regain its original content.

TESTS.

The water received was run without filtering or any preliminary treatment except the addition of C. P. caustic potash in order to absorb CO_2 , making less gas to pass into the electroscope. Water was received as follows:

Sample drawn 11:25 a.m. February 23, 1915
New sample drawn.... 4:00 p.m. April 1, 1915

In testing this sample it was noted that the activity was great. . . . This water has a considerable amount of black sediment and when a sample was drawn more or less of this might be included. There was also indication of recovery when the boiled solution was left standing for some days. This is exactly what one would expect if a trace of radium salt were in solution. Some of the sediment is under test to ascertain whether this is the case and if so, what its radium content may be. The average of all runs on this sample gives 64.8 M. U. per litre. . . .

As indicating the comparative activity of spring waters, reference may be made to *Radium*, April, 1915:

Hot Springs, Ark.,	vary from	.07 to 23.6	M. U.
Saratoga Springs	" "	1.08 " 2.37	M. U.
Colorado Springs	" "	.21 " 10.4	M. U.

This spring seems nearly three times as active as the highest American spring previously reported. After the determination of the activity of the sediment it may appear that the *initial* value of this water is even higher than shown.

Respectfully submitted,

J. S. SHEARER.

SUPPLEMENTAL REPORT, DECEMBER 21, 1915.

A further study of sample of brine, drawn 4:50 p. m., October 22, 1915, gives approximately sixty-eight mache units per litre of water. That the activity as shown is due to radium salts in solution is shown first by the rate of decay of emanation, second by the ability of the water to recover its emanation content at a known rate, regaining half its value in 3.85 days. In addition to the emanation in solution in the water, there may be some in the gas evolved at the spring.

The value of sixty-eight mache units for this brine shows the radium emanation in equilibrium with the dissolved radium salt, hence this amount of emanation may be obtained from each litre of water every thirty days or half this amount every 3.85 days. As the salt is in solution the water may be boiled down or otherwise evaporated, and will show concentration of the radium content.

Respectfully submitted,

J. S. SHEARER.

The chemical analysis shows this brine contains a twelve per cent. solution of sodium chloride and a 4.12 per cent. one of calcium chloride, the two principal chemical constituents of the bath. If compared with the analysis of the Bad Nauheim Spring it would be seen that by diluting this Glen Springs brine it would be made to correspond to the baths of Bad Nauheim, without the necessity of adding "mother lye," obtained by evaporation, for strengthening their weaker brines. Thus, in beginning the treatment this brine is diluted six times its volume with plain water, and as the course of treatment progresses this is increased to suit individual indications.

The Glen Springs uses a method of artificial carbonation which facilitates the generation of a uniformly constant volumetric amount of CO_2 gas for each bath strength required. Thus, it will be seen, that for this Nauheim bath a natural brine highly impregnated in calcium chloride and sodium chloride content, with other minerals, and definite volumetric saturation of carbon dioxide is used. Added to this is a high radioactivity, sixty-eight Mache units per litre, that is not evanescent but remains constant

because of the radium salts in solution and to which I shall refer later.

PHYSIOLOGICAL ACTION OF CARBONATED BRINE BATHS.

The chemical constituents of the bath, penetrating the superficial dermal layers by imbibition, stimulates the peripheral nerve endings. After the bath the patient is dried, but not sprayed, leaving these saline constituents in the skin, thereby effecting a continuous stimulation for some time of the peripheral nerve endings producing a rubefacient reaction. This integumentary hyperemia produces an indirect result on the distribution of blood and helps to relieve the congestions of the viscera, thereby relieving in varying degrees the work of the heart.

Sodium and calcium chloride promote absorption of gas into the skin, then, being absorbed, into the bloodstream. This is of little import. The mineral composition enables the giving of definite temperatures, without much loss of temperature during the bath. It effects a better CO_2 saturation because of its maintaining an even temperature.

Carbon dioxide gas has the property of adhering to the skin surface of a patient immersed in a bath, thus, forms a CO_2 envelope about a patient's body. The brine forms a contact with the skin between each small bubble. Therefore, on this skin area, coexisting side by side, are minute areas protected by small bubbles of CO_2 gas, and other areas covered with brine. A too rapid dissipation of body heat in temperature below 93°F. is prevented by these CO_2 bubbles, as radiation of the body heat through this gas film is checked or minimized because heat is radiated through gas less rapidly than through water. To illustrate this further one needs but to recall that at 89°F. heat production and heat loss equilibrates on the nude skin exposed to contact with air. In other words, it is a point of thermic indifference or thermic comfort. In water this equilibration of heat production and heat loss occurs at 93°F. With carbon dioxide gas this point of thermic indifference is 75°F. Therefore, with minute areas of water below the point of thermic indifference, necessarily a chilling of the point of contact results. With coexisting minute areas, however, filled with a gas with its point of thermic indifference below that of water -75°F. —in contact with this skin surface and with this water much warmer than the carbon dioxide's point of thermic indifference, it is really obvious that two sensations are produced upon the skin, first by the brine being below the point of indifference giving a sensation of cold, and second, the carbon dioxide gas being above its point of thermic indifference producing a sensation of heat. This means that a compromise is effected between the variant points of thermic indifference of water and carbon dioxide, combining the advantage of obtaining the maximum effects of thermic stimulation with the minimum of risk to the patient. The cooler the water and the stronger the brine the greater is the CO_2 saturation and the greater the compromise. Thus in a bath of 88°F. , the skin is subjected to thermic stimulation of heat and cold, heat from the CO_2 bubbles and cold from the brine alternating and counteracting each

other. A small proportion of the CO_2 is absorbed and directly or indirectly acts upon the sensory nerve endings increasing the circulation. When first entering a carbonated brine bath a sense of chilliness is produced: carbon dioxide bubbles immediately begin to adhere to the body in great numbers and soon the sensation of chilliness is followed by one of warmth due to neutralization of this relative coolness of water—indifferent point, 93°F ; bath is 88°F .—by the relative heat of the CO_2 indifferent point 75°F .

The vasoconstricting effect of cold water is offset by the vasodilating effect of the CO_2 . With the absorption of a small amount of this gas the arterioles relax, while the capillaries are constricted relatively, possessing a better tone, but actually not much changed. A marked reddening of the skin that is submerged is produced in contrast with the comparative pallor of the skin that is not submerged. Thus the body later has the reaction of a cold bath without the intensive protective contraction of the superficial bloodvessels with its resultant internal congestion that would occur in an ordinary cold bath and that would be so harmful if happening when the internal organs were in a varying degree of congestion, and instead of helping the heart it would add to its burden. In baths below the point of thermic indifference there is but a moderate constriction of the superficial bloodvessels which serves to accelerate the heart beat. This tends to whip up the sluggish circulation when vasodilation occurs, thus serving to equilibrate the central and peripheral resistances. The pulse, if irregular, becomes more regular; the systole stronger, the pulse becomes large, full, and slower; blood pressure is raised generally at a temperature less than 90°F , and lowered at temperature above 93°F . In high blood pressure cases, if the bath is above the point of thermic indifference, there is no preliminary constriction, and with a dilatation produced by the CO_2 it is obvious that if peripheral resistance be reduced the tension will fall and the cardiac load decrease. The blood pressure varies as the rule with the temperature and in cases of high blood pressure I never go below 92°F , unless the pressure is progressively decreasing and any drop in temperature is always watched for effects. I shall detail later indications and contraindications with each condition mentioned.

Radium.—Just what is the definite rôle of radium salts in solution and the emanation that they produce in the baths, I cannot say. Despite this lack of tangible proof, practical results have led me to believe that they do materially enhance the therapeutic value of the brine that is used for this bath. From the most recent works it seems that it does have a stimulating effect upon metabolism, which necessarily means that glandular secretions are acting more harmoniously in their intimate relationships and thus aiding the heart. That it further affects metabolism is shown by the fact that it increases the number of red blood cells and their hemoglobin content. Cases of hypertension have been helped by its administration internally and by inhalation. The radium emanation may be absorbed through the skin or by inhalation through the lungs.

DYNAMIC APPLICATION. TECHNIC.

The Glen Springs method employs a series of five baths. It is to be understood that this is the standard scheme and by no means represents the variations of these baths to suit individual needs. From the analysis it is seen that the brine is too concentrated in its original chemical content to begin the treatments with, so that it is diluted with five volumes of fresh water and gives a brine containing 2.0 per cent. sodium chloride and 0.68 per cent. calcium chloride.

Two noncarbonated, diluted brine baths, temperature 98° to 94°F ., are given as preliminaries and constitute the first series. The second series is composed of four baths of diluted brine and 3,702 cubic inches of CO_2 which is liberated during the bath. The mean temperature is from 96° to 92°F . In the third series of four baths, dilutions are increased in the last two baths to one-fifth, generating 6,664 cubic inches of CO_2 gas and given in temperatures beginning at 93° and reaching 90°F . as the concentration is increased. The fourth series is composed of four baths, diluted brine one-fifth to one-third, liberating 8,884 cubic inches of CO_2 gas, beginning at 90° and falling to 88°F . The fifth series is not composed of a definite number of baths, this being determined entirely by the patient's reactions and course and to some extent by the clinical pathology present. The dilutions begin at one-third, increasing to one-half and then to a full brine with the generation of 17,720 cubic inches of CO_2 gas, temperature being 88° to 84°F . as determined by the reactions, and the duration from twelve to twenty minutes.

The duration of the other baths are subject to such variations that it is not possible to give them; suffice it to say that in beginning short durations are indicated until a patient's reaction is fairly well established in the prescriber's mind. The bath is prepared and the patient is assisted into the tub he lies leisurely at full length, with a foot rest and his head cushioned by a folded towel. Perfect quiet and relaxation are insisted upon so as not to disturb the bubbles adherent to the skin. At the end of the bath he is assisted to rise and is dried with warm towels, wrapped in a warm sheet by an attendant and is then made to rest from one to three hours in bed in a quiet room. Pulse rates are taken before, during, and after the baths and recorded. Respiratory rate is also noted. Blood pressure readings are made in cases that require such attention and charted. Each bath is prescribed on the day of the bath and the record of the previous bath is in this way easily accessible to the attending physician, and in the end graphically illustrates the patient's reactions to each bath. This accessible information combined with the subjective reactions and objective findings determines the next bath prescription. As a rule these baths are given on alternate days, although in some few cases four baths may be given in a week.

Accessory measures are employed and will be considered under the various conditions described and under its special heading. The direct connection of the bath house with the hotel obviates the risks

from exposure and overexertion. Each bath is in a private room which is well ventilated by mechanical means and is kept at a temperature of 78° F. A definite time for each bath is given the patient, usually in the forenoon. If the bath produces too great a sensation of oppression with respiratory distress, a half bath is given. If any distressing symptoms occur the attending physician is immediately notified. The Glen Springs has the advantage of never being overcrowded and this eliminates stereotyped technic. At no time do we hustle cases along because of lack of time and each patient always has the same physician who gives the required amount of individual attention. The inclusion of medical fees in the weekly rate eliminates the pecuniary embarrassment in the case of some patients, whether this be either relative or absolute and works as well for the physician who can exert himself for his patient's behalf without giving the sometimes false impression of commercialism.

RATIONALE.

From the number of patients, who, when admitted, are found to be unfit for the application of this Nauheim method, it is concluded that a conception prevails among the laity and among a few medical men that this form of treatment should only be resorted to when other measures have failed. Let it be emphasized that this treatment intelligently prescribed is not administered as a panacea for all forms of heart and circulatory disorders. It is not by any means a cureall and anyone claiming such exaggerated therapeutic value for this method is doing it an injustice.

This method accomplishes results when given to patients selected for it after careful diagnostic methods have been exhausted in determining their fitness. The most important factor to be determined is whether the disordered heart can bear the added stresses of gymnastics produced by this bath. How can this be determined? How can we estimate dynamic efficiency of the cardiovascular system? This can be done by carefully noting the subjective and objective findings. Most important of all is the application of tests which will serve to give us an insight as to the amount of reserve that the myocardium possesses. Many tests, some simple and others complex, have been devised for this purpose. Personally, the simple ones serve me best. All are dependent on the effects of blood pressure, pulse, and respiration. These are noted before a test is made, just after the test, and at varying periods of time after this to note approximately how soon it requires to establish a relative recovery, taking the initial records as standards.

In normal hearts one finds that, following exercise, the rate increases with a rise of blood pressure and at rest returns to its previous condition in a relatively short space of time. In impaired hearts the rate is changed out of all proportion to the amount of exercise and the systolic pressure is but little affected and slow to show itself. Respiration is embarrassed and may be labored. In bad hearts, the rate goes wild, the systolic pressure may fall, and the respiration is labored. Its return to its initial condition is slow. Pulse pressure must be considered and determines in a great many cases the

index of a patient's progress. A pulse pressure over sixty generally indicates cardiac overload. The greater the pulse pressure as compared with the diastolic pressure, the greater the danger of cardiac failure. In cases with low diastolic pressure and high systolic pressure one must be very cautious with CO₂ brine baths. In cases receiving treatment in which a diastolic pressure is increased and the systolic is decreased, there is assurance of an increased myocardial inefficiency. A differentiation of neurocardial and myocardial conditions is essential. This is done chiefly by three tests: 1. In Aschner's oculocardiac reflex, pressure with the fingers on the eyeballs of a normal person slows the rate from four to eight beats a minute. When this phenomenon is retarded or if it slows the heart twelve to sixteen beats or accelerates it, it suggests a disorder of the cardiac innervation. 2. Trigeminal irritations from smelling salts, etc., slows a normal heart but acts reversely on a neuropathic heart. 3. Atropine's physiological action in large doses is to paralyze the vagi and thus its control is lost with a marked increase in heart rate from thirty to forty beats a minute in conditions in which the vagi are at fault. In myocardial changes this increase is not more than twenty beats. Thus the neurogenic factors can be differentiated from the myocardial factors and treatment may be intelligently prescribed.

It is also important to estimate venous pressure which expresses in a crude way the amount of decompensation present. Recklinghausen has suggested a bedside method that perhaps is as efficient as some of the so called "scientific estimations" used. The patient is in a recumbent posture, the left hand by his side on the bed, the right hand resting on his thigh. If the veins of the right hand, slightly elevated, collapse while those of the left swell out, a normal pressure exists. If the veins of both collapse the venous pressure is low; if they are both filled venous pressure is too high and indicates a poor compensation. In the first two conditions benefit is to be expected; in the last condition it would be fallacious to give the baths.

From the above deductions one concludes that the morbid pathology of a heart is not the important factor in deciding the rationale of this method of therapy. By these various tests and careful weighing of the subjective findings, the psychic valuations, and last the existent pathology, we are able to measure with a fair amount of certainty the functional capacity and efficiency of the myocardium. Furthermore, it is possible to avoid the error of risking the treatment, only to find later that it has caused actual damage, and then to discontinue it. It would be equally unjust if some sufferer was judged unfit and thus deprived of possible benefit, because the findings were interpreted pathologically and not considered from a functional standpoint. Examples are numerous of constitutional defects, yet no alteration of correct function. How many hearts have valvular lesions, compensatory hypertrophies, and arrhythmias without producing a symptom which is recognized until a chance examination is made. Such a heart has compensated fully and is functionally healthy; yet, in the language of pathology and morbid anatomy it is

wrong, diseased. The pathological conception is scientific, but unfortunately, most scientific conceptions are static; a few of them are dynamic. The patient needs and wants a dynamic conception, for it is this conception alone that will bring about the desired result. Just a word to say that it is of importance in some cases to put the full valuation on pathological findings in order to estimate correctly the reserve strength as in cases of auricular fibrillation, true heart block, and pulsus alterans. In conditions such as vagatonia, sympathetonia, and their allied states one must keep in mind their irritating functional influences and the psychological reactions in determining the functional reserve in the applicability of this method for their benefit.

In conclusion, it is emphasized that the rationale of this form of therapy depends upon the summation of the physical subjective and objective findings, test reactions, correct interpretation of these reactions and a close observation of psychic processes of the patient to determine what part they play in the interpretation of his symptoms and the significance that he attaches to the symptoms.

INDICATIONS.

In trying to mention the conditions in which this therapy is indicated it is presupposed that a careful estimation of the functional capacity of the myocardium, as detailed previously, has been done with satisfactory results, and thus a logical reason has been established for its use as applied to the anatomical and pathological conditions enumerated. Emphasis is made upon functional tests to determine the amount of reserve that a heart possesses. Even though a heart shows decompensation, if it possess reserve, it is prepared to meet the extra stress that is thrown upon it by the baths. These are simply gymnastics produced by the thermic stimulation and result, first, in positive peripheral resistance with a secondary peripheral dilatation, the peripheral resistance first stimulating the heart to increased activity, thus drawing on its reserve. Later because of this secondary peripheral dilatation, the peripheral vessels are increased in blood containing content, thus lessening the resistance, effecting a more even distribution of blood between periphery and the visceral vessels, and necessarily lessening the heart's burden. Like any other machine, it acts more smoothly and sweetly and with much less real and apparent effort when relieved of the necessity of carrying a maximum load or an overload.

This treatment is indicated in cases of cardiac weakness following the acute infectious diseases; conditions as secondary anemias, diabetes, debilitation or wasting conditions in which there is evidence of cardiac involvement or inefficiency; postoperative cardiac conditions produced either by operative procedures or postoperative infections; cardiac disorders as engendered by intoxications, whether intrinsic or extrinsic, presupposing the elimination of the etiology; cases of myocardial insufficiency with low blood pressure; cases of myocardial degeneration following the compensatory hypertrophy and dilatation incident with valvulitis; myocarditis, parenchymatous and interstitial not acute; aortic regurgitation, mitral regurgitation, mitral insuffi-

ciency, pseudoangina and true angina, in a few cases; cardiac neurosis; cardiac disorders incident to disorders of the vegetative nervous system and some cases of Graves' disease; simple dilatation the result of overstrain or overwork; and in hypertension and hypotension.

CONTRAINDICATIONS.

The treatment is contraindicated in cases in which there is considerable decompensation with the heart unable to show any reserve response to functional tests but able to demonstrate its inefficiency by dyspnea, increased pulse rate, and a fall in blood pressure. Its return to a relative standard initial condition being slow on reacting to mild tests. It matters not what the anatomical or pathological diagnosis may be, or whether the heart is primarily damaged or secondarily involved, baths are not to be administered. Rest, diet, drugs, ice bags, etc. are to be used until the heart reacts.

It follows that in cases of extreme decompensation where dyspnea, rapid, weak, irregular pulse, and either in a low blood pressure or a high blood pressure they are absolutely contraindicated. Aortic insufficiency in the majority of cases is not benefited by the CO₂ brine baths. Mitral stenosis is an absolute contraindication. Aortic stenosis contraindicates. The acute disorders of the heart, whether myocardial, pericardial, or endocardial, are not to be treated in their acute stages but, after the orthodox medical treatment with results, are then suitable cases for this treatment. Hypertension due to either marked arterial sclerosis or renal involvement is a contraindication, but not absolute. True angina pectoris in a great many cases is a contraindication to the baths, yet many receive relief and benefit from them. Aneurysms, aortitis and cardiac asthma are usually contraindicatory.

ACCESSORY MEASURES.

Accessory measures include diet, mechanical methods, massage, and hydrotherapeutic measures. Suffice it to say that this diet is to fit the individual needs and differs but little from that prescribed at home. In some cases the Zander treatment is given. Massage is prescribed when passive exercise is indicated. Other hydrotherapy is prescribed aiming at the relief and benefit of complicating symptomatology.

After the patient has had a chance to react partially to the added stress of the baths and it is determined that cardiac function has improved and that the myocardium has had an increase of reserve, it is wise to undertake to provide exercise for this muscle under careful supervision. Heart muscle responds to exercise in much the same way as the skeletal muscle and by careful adaptation of exercises its muscular tone may be developed considerably. Two methods are used: 1, resistance, either as elaborated by Schott or with dumbbells or other weights; 2, hill climbing as suggested by Oertel. The Schott method depends upon resistance to muscular effort. This resistance may be applied by the patient himself, who can oppose a movement with the opposing group of muscles, or by an attendant. The movements must be slow and fully carried out. The body should be held up-

right and the joints straight and the exertion should never be so intense as to cause a tremor of the muscles, shortness of breath, or undue fatigue of these muscles. There should be a pause of one half minute after each successive movement, such as raising and lowering the arms, and a pause of two or three minutes between movements of different kinds. Fifteen exercises are briefed from Schott's work as follows:

1. The arms are to be raised slowly outward from the side until they are on a level with the shoulder. After a pause they should be slowly lowered.
2. The body should be inclined as much as possible towards the left then to the right.
3. One leg should be extended as far as possible sideways from the body, the patient to be steadied by holding on to a chair. The leg is then returned to normal position and movement executed with other leg.
4. The arms are raised in front of the body to a level with the shoulders and then put down.
5. With the hands on hips, the body is bent forward as far as possible, and then raised to the upright position.
6. One leg is raised forward with the knee straight as far as possible, then returned, and same movement executed with other leg.
7. With the hands on hips, body is twisted around to right and then to left.
8. Steadied by a chair, erect posture, the legs are raised as far as possible backward, alternating right and left.
9. Extend the arms, fists supinated. Movement outward and inward to the height of body.
10. Each knee is flexed as high as possible, then the leg is extended and returned with alternations.
11. Each leg is flexed on the knee as high as possible and then returned.
12. Each arm is bent at the elbow and straightened.
13. Extend the arms from the sides, forward and upward, then down and back as far as they will go, elbows and hands straight.
14. Arms extended sideways, level with shoulders, flexion and extension of forearm slowly.
15. Arms extended straight in front, level with shoulder, movement outward, then inward.

The dumbbells are substituted at times for the resistance to the arm movements and if one is mathematically inclined it is possible to calculate the amount of work done. This is perhaps a more accurate method and in some cases it is obvious that the work could be better gauged for the more delicate reactions in cases that required these distinctions.

Hill climbing after the scheme of Oertel also serves an excellent purpose in determining accurately the amount of work done, for each path has a known degree of elevation and known distance and opportunities for rest are provided at stated intervals. Beside these advantages, it possesses the advantages of open air and mental distraction by the scenery and observations of nature. At the Glen Springs this form of exercise might be said to be the most popular. For a graphic illustration of this scheme of hill climbing paths the reader is referred to the map of the Glen Springs Park with the directions as to where they are located, their distance and degree of elevation. Each path is numbered, thus facilitating a comprehensive description of what is expected of the patient.

(To be continued.)

SYMPATHY, AFFECTION, LOVE, AND PATIENTS.

By ISRAEL BRAM, M. D.,

Philadelphia.

"He is the nicest doctor I ever saw! So magnetic! So good! So friendly and polite! He's simply wonderful! Of course, his fee is awfully high, but he's worth it—I feel better already!" So spake the ecstatic little Mrs. Lonely, the pretty matron of twenty-four, who has for a long time been ailing with what has been diagnosed as "nervousness," supplemented by an occasional timely fit of hysteria. She has had at least twelve doctors who endeavored to write wonderful dietetic, hydrotherapeutic, and pharmaceutical formulæ; she has been given a trip to the West, another to the South, and finally one into Canada. In brief, she has seen allopaths, homeopaths, neuropaths, chiropractics, osteopaths, naturalopaths, and even a disciple or two of Mrs. Eddy's clan. She has been the subject of experiment and exploitation for the past two years, and has succeeded in spending a small fortune and developing a grand disgust with everybody, including herself.

What is wrong here? So simple, yet so little recognized by the vast majority of medical men, dignified men of science—merely lack of affection, lack of love of her husband who is too busy with business matters to think of his wife. Some one coaxed her to try this new doctor, and she reluctantly obeyed; and now, she is well nigh cured. The doctor is a wonder! Doctor Sage, the well known diagnostician, knows full well that Mrs. Lonely was lonely, that the trouble here is that of improper emotional balance. Mrs. Lonely is naturally of an affectionate nature, and her husband is never in sight, as a result of which there is a surcharging of the nervous system with emotional tension; hence, the fidgety, neurotic, restless, squirming, hysterical creature. She was merely suffering from love starvation, a condition which may well be called "mal-amour." Why did Doctor Sage succeed? Having made his diagnosis, he smiled, winked his eye, told a funny story which soon chased gloom to eternity, and proceeded along the following lines: 1. An abundance of magnetic politeness, more of sympathetic demeanor, still more of smiles, and a positive assurance of the patient that all will be well in a short while. 2. The administration of R Tr. nucia vomice gtt. V, in water t. i. d. Remark: no, this has hardly any value other than that of a placebo. 3. Last, but most important, in fact, the specific, a heart to heart talk with Mr. Husband, during which Doctor Sage informed him that only a foolish, selfish husband neglects his wife, and that it was high time to consider her his better half and his chum. Mr. Husband, realizing what a renegade he has been, promises to be a model husband and rushes home to his wife. The patient is cured!

The young doctor who has just emerged from a five or six years' hard medical training has had a thorough study of anatomy, physiology, chemistry, materia medica, pathology, diagnosis, etc., etc., which make him a walking encyclopedia of medicine. Has he any knowledge of the human emotions, the finer feelings which exert so potent a force upon every organ and function of the human

frame? Has he received any knowledge of that vast field of psychology, the field which seems to differentiate man from all other life, a subject quite as important as anatomy, the human emotions, which really constitute the mortal world? Unfortunately, no! He is taught to treat the deranged body as a cold, deranged machine; and the doctor is the cold, scientific machinist who sets things aright, or thinks he does. The technical education which does not simultaneously take into account the importance of studying human social relations and the vacillations of an individual's emotions under certain conditions, falls short of completion. Especially is this psychological training of inestimable value as a constituent of the medical curriculum. A severely technical training usually disturbs the counterpose between mind and "heart." The latter, synonymous with what is commonly termed character, contracts, hardens, ceases to partake of the universal throb, loses its normal relationship with its fellow mortals, and soon perishes. Thus the man of cold science, a virtual hermit secluded within himself, becomes a cold observer who, in the selfishness of scientific acumen, looks on mankind as the object of his experiments.

Human feelings, sentiments, emotions, "the heart," in brief, the higher cerebral centres, the chief element of which is volition or the ego, are what make the world go 'round. Each person centered in his own little sphere, a little universe of his own, each with his own burdens, aspirations, affections, ambitions, passions, and antipathies, is it any wonder that one's neighbor is neglected; the latter's rights, written and unwritten, are ignored and forgotten? Is it difficult to conceive many a well meaning person, impressed with the importance of his own sweet self, permeated by his own desires to the utter disregard of the desires and feelings of others, causing a degree of injury to that other which expresses itself in the mental and physical derangements? This almost complete circularity of the ego is the real human shortcoming, even manifesting itself in relation with blood relatives, and form the genesis, the root of one half of the ailments which medical men are called upon to alleviate. Indeed, this circularity of the ego is in many instances only temporarily broken and the sentiments made temporarily to extend into the hitherto alien atmosphere of the outer world, by an obviously very ill state or death of the friend or relative in question, only to return as the snail or oyster, into its protective shell within a brief while.

That the mind influences the bodily structure and functions, controls every organ, every cell to greater or lesser degree, is no more a matter of conjecture; it is but necessary to observe a bit to be firmly impressed by this relationship. Seeing some one hurt in an accident or the sight of blood often causes the observer to vomit or faint; the excitement of joy or anticipation gives rise to loss of appetite; worry, chagrin, and fear lead to indigestion and insomnia; the presence of jovial, cheerful companions at a feast will enable one to consume enormous quantities of food with impunity. Moderate sorrow increases, great sorrow checks the flow of tears; tense anxiety gives rise to cold, clammy skin; the change in quantity and quality of milk in the breast of a mother,

because of emotional excitement, with consequent injury to the infant, is a common occurrence. When one has not eaten for several hours, the sight of a well arranged display of pastries or the odor of the busy kitchen will arouse a gnawing hunger and cause a flow of saliva and gastric juice. How often have I seen the medical student, facing an examination, suddenly find himself suffering with nervous diarrhea, a splitting headache, or as sometimes happens, mental vacuity! Who has not seen the blush of shame or modesty, and what the doctor has not observed, a patient's pulse rate of seventy rise to over a hundred when the latter enters his office for the first time?

Conversely, the various bodily affections influence the mind in various ways. The apathy, mental dullness, hebeticism, coma, or delirium caused by the various toxemias and febrile affections are matters of daily observation. The sudden loss of blood in the brain through peripheral hemorrhage results in vertigo and syncope; an increase in thyroid secretion gives rise to the alertness, the extreme cerebral hyperactivity characteristic of exophthalmic goitre; a diminution of the same secretion is conducive to the slow vocalization and tardy cerebration symptomatic of cretinism or cachexia strumiprævia, as the case may be. The drowsiness, fatigue, and somnolence following the ingestion of large quantities of food, especially meats, is the common experience of almost everyone. What "school marm" has failed to observe the close relationship existing between adenoids and mental deficiency among her pupils? And what busy doctor has failed to observe an occasional instance of talkative delirium consequent upon the instillation of a drop or two of atropine solution into the conjunctival sac? These and many more instances which for lack of space we are spared the pains to enumerate, should convince one of the importance of a careful study of psychical phenomena. The physician cannot be a master of the body unless he is also master of the mind, for the two are inseparable.

The living human body is not fairly comparable to a boiler or locomotive, as is commonly done in our public schools, and often implied even in our colleges. The body is not merely the place where there must be maintained the proper equilibrium between construction and destruction, between repair and waste, between anabolism and catabolism. The human being has a mind which profoundly affects the entire body, and this body profoundly affects the mind in return. Man has a thinking apparatus which the machine has not; his feelings can be injured, quickened, depressed, with various bodily reflex results. Man can love and esteem, and, unfortunately, hate, and is ever desirous of being loved and esteemed by his fellows. A disturbance of the balance of man's affections, passions, or feelings is always accompanied by bodily derangements, perceptible or imperceptible.

What is here meant by "love starvation?" The term "starvation," whether of food, drink, sleep, air, or love, need not detain us. It is self-explanatory. It means lack of supply of that which should be normally demanded. At times the demand may appear unreasonable, but this unreasonableness in turn is

often the outcome of a prolonged withholding or starvation in the presence of normal demands, the subject becoming so starved as to find himself obsessed with the injustice of humanity, hence the craving. This oppressed, ironical attitude often knows no bounds. Here we may have an instance of unreasonableness as that commonly observed in hysteria and neurasthenia. In brief, normal demands exist only in the presence of normal supply; when normal supply is withdrawn, normal demands give way to excessive cravings, and the demand becomes abnormal and unreasonable.

Everybody, barring no one, desires sympathy, esteem, affection, love. There may be exceptions to all rules under the sun, but there is no exception to this, not even in the lower forms of life. Even the vegetable kingdom thrives and flourishes best under the care, the affection of the gardener. The trees, the flowers, even the grass, crave the love of the human friend to the extent that they desire the golden sunshine and the gentle raindrops from heaven. In the animal kingdom, from the very unicellular ameba to the most complex, man, there is, along with the instinct of self-preservation, that craving, that hunger for sympathy, affection, love. Without love, man is like the hunted beast of the forest; with love, the ferocious beast of the forest becomes as tame and docile as the domestic kitten. Love is the tamer of lions, the antidote for hatred, fear, cruelty, misery, and despair. In many diseases, love is more potent than medicine; in desperation and sin, it is far more powerful than all reformatories and jails in creation. Would you know the cause of deceit, falsehood, iniquity, disease, hysteria, neurasthenia? Would you know the real cause of war? Love starvation!

By love in this essay is not meant *merely* that subtle emotion, that inexplicable tie which attracts the sexes, and far be it from me to attempt the definition of a term which even from the time of Adam and Eve has resisted all attempt at analysis. On the other hand, I hasten to remark that nothing is further from my purpose than to exclude from consideration absolutely that wondrous feeling usually called love, that emotion, sentiment, or mental aberration (?) which makes the wise foolish, the foolish wise, the weak strong, and the strong weak. I repeat that I do not for a moment desire to convey the impression that we exclude from consideration that mysterious emotional state which has constructed and destroyed empires, that principle of existence which makes Herculean feats easy to accomplish, that happiness of existence which turns all to bliss, to praise, to song and verse. Yes, my brother, this greatest of all human forces in man's mental existence, this state which converts earth to Heaven, and sometimes to Hell, is included in our paper! This form of love is not only included here, but it is frankly admitted that its malproportion, whether deficiency, absence, irregularity, delay, or what not, is perhaps the most important item in our views on love starvation.

Love connotes various other, though subsidiary, varieties of affection which are capable of wreaking havoc, especially in those of sensitive nature. The lack or deficiency of parental affection will often

cause the child to become morose, an old mother will become melancholy on seeing her adult son or daughter drift away from maternal ties. Brothers, sisters, cousins, all are now and then, consciously or unconsciously, guilty of misapplication or withdrawal of the love which they are bound by blood ties to manifest, and the sufferer finds herself or himself in the doctor's office, a subject of nervousness. The sudden frigidity of "friends" sworn or unsworn, inconsideration of employers, an occasional slur through word or deed by an acquaintance, the boarding house mistress, or even a stranger, will in some cases be the starting point of a spell of nervousness leading to hysteria. The human being is essentially the mind; the body is quite similar to that of the lower forms of life. This mind is in its very selfishness possessed of gregarious or social cravings; in other words, the human mind yearns, lives for affection, esteem, love of those about. There is no such thing as a real hermit. This love craving propensity is adjusted with a fine, hair spring mechanism, and is easily upset, a little glance, a word, a gesture, resulting in anguish, self-torture, neurasthenia, hysteria.

The common mode of treating neurasthenia and hysteria, and here I must specify that I include only those cases not presenting congenital or inherited etiological factors, has been by icy sternness. "Do not sympathize with her; she must be forced into common sense. There's nothing wrong with her; she's just bluffing!" These, and similar exhortations have been the doctor's orders with respect to these unfortunate creatures. Could you quench fire with more flames, and calm an excited mob by inciting more anger? If these are impossible, so is it the height of folly, so is it cruel and inhuman to further rouse the turbulent emotions by antagonism. Efforts at logical subjugation of the patient to common sense and at persuasion, with a view to the avoidance of further outbursts of these "fits," should be tried with intelligence, caution, and tact, and only between attacks, i. e., during the intervals in which there is relatively good health, or after the patient has been sufficiently nursed back to health to be capable of calm, deliberative reflection. The "nervous" patient, not only women, but men also, demands not severity and frigidity of the caretakers, but the kindest charity in the method of approach; for these poor souls suffer most of all from love starvation. Such a patient's doctor, nurse, and relatives must exercise temperate judgment, patient firmness, discretion in word and deed, and an earnestness which wins the confidence of the weak one. The latter, fed on this consideration, affection, love, soon ceases to be starved; there is a restoration of emotional equilibrium, strength of mind and body returns, and the patient is well and strong. In this connection, it must be observed that the patient's habits, tendencies, petty obsessions and vices, if these exist, must be learned. Often, after the patient's confidence is had, he or she will open up the soul and confess to the physician the "secrets" which have been torturing the mind, and which have been the cause of the difficulties. How often is it discovered that the trouble began with lack of affection on the part of one or more relatives or friends!

How often, to be sure, is it the old, old, story of unrequited love of the opposite sex! A confession is then a rather fortunate circumstance, for there is not only a relief of the marked mental tension, but what is most valuable, it gives the physician an opportunity immediately to endeavor to overcome the cause of the trouble by the proper psychical appeals. To quote our esteemed S. Weir Mitchell: "To confess is for some mysterious reason most profoundly human, and in weak and nervous women, this tendency is sometimes exaggerated to the actual distortion of facts. The priest hears the crime or folly of the hour, but to the physician is oftener told the long, sad tales of a whole life, its far away mistakes, its failures, and its faults. . . . The causes of breakdowns and nervous disaster, and consequent emotional disturbances and their bitter fruit are oftener to be sought in the remote past. He may dislike the quest, but he cannot avoid it. . . . The moral world of the sickbed explains in a measure some of the things that are strange in daily life, and the man who does not know sick women does not know women."

It is admitted that many cases of nervousness, neurasthenia, and hysteria, are unreasonable and at times exasperating. Here again we are dealing with a sufferer requiring therapeusis of the most charitable, the most tactful, diplomatic sort. Is not this person suffering from an abnormality? If this be so, why not treat by the neutralizing, the mollifying forces of mental therapy? In fever we sponge a patient, administer grateful beverages to quench thirst, overcome respiratory embarrassment by plenty of fresh air, apply an ice bag to soothe an area of congestion. Then is it not reasonable, humane, and the most natural thing to combat a mortal's mental turbulency by the calm, soothing, healing influence of sympathy and affection?

What is that which I call sympathy? It is a quality which enables one to enter dramatically into the joys and griefs and sorrows and woes of others, to comprehend what the others suffer and experience. In brief, to feel with and for the sufferer, and to be able to assist in calming the troubled waters of life by proper word and deed. Though this quality is easiest acquired by those who have themselves suffered, this is not necessarily the case. Many physicians who have not suffered greatly in body and mind, but who are endowed with a benevolent, imaginative power, feel for and with their patients, even to the extent of actual subjective suffering. Here let me sound a note of warning. As in the case of drug administration, the patient has his or her idiosyncrasies; comes from this or that social, intellectual, or financial stratum; is subject to various mental peculiarities; and consequently requires careful study before actual mental therapeusis is attempted. Strict individualization is therefore the keynote in this regard. The mere poulticing of the feelings of the sufferer through a few gratiating, stereotyped phrases may do for the average mortal or for the weakminded creature who is so sympathy hungry as to reach for even a tiny crumb of affection; but the patient possessing average reflective powers secretly rebels against the doctor who lacks tact and diplomacy. Real sympathy can only be meted out by the student of human nature capable of in-

dividualization; each case is quite different from all the rest; the doctor's words and actions must reveal in him a keen interest, strength of purpose originating from firmness of conviction, from self confidence which alone can gain respect.

If it is true that everybody desires sympathy and affection, it follows that the sick one desires a little more than his share. It is not only the "nervous" patient who requires the assistance of the physician's personality. Even in cases primarily organic in manifestations, the physician's personality enhances the therapeutic powers of the measures employed, thus enhancing recovery; the potency of this supplementary psychic factor varying with the mental fibre, the intellect of the patient. In cases of typhoid, pneumonia, influenza, and the like, the confidence in the physician, no matter how skilfully prescriptions are written, is of importance. The patients and relatives must never be permitted to lose heart even in the face of great odds, else all is lost. The patient must ever be kept in courageous, hopeful, even jubilant spirits. A change of medicine, a slight change of diet, a funny story, and the never-to-be-forgotten friendly handshake on entering and leaving the sickroom, are items which often spell success and confidence.

Women require especial consideration with regard to the psychic attitude of the medical attendant. Considering the false, illogical notions of their education; the poor social status; the prevailing tendency of women to compete in almost every masculine pursuit; considering also the prostitution of the sacred obligations, especially by men, which should exist between man and wife, and which if properly fulfilled spell perpetual harmony of mind and body, —considering all these factors and many others which would require a fair sized volume to enumerate, plus the extreme delicacy, the complexity of woman's nervous system, is it any wonder that this sex suffers far oftener and far more intensely from "nervousness," especially hysteria and neurasthenia, than men? And with all this, it is gratifying to know that women are far more susceptible to corrective appeal, to logical persuasion on the part of the doctor in efforts leading to the amelioration of her difficulties, than men.

Very few physicians, and these are the eminently successful ones, are born with that quality which enables them to enter dramatically into the feelings and emotions of the patient, to feel for and with the sufferer. The great majority of members of the medical profession must acquire this quality sooner or later, if they are to reach their goal; the few doctors who fall by the wayside and blend into other pursuits of life, are those whose makeup renders it impossible to adapt itself properly to this vital requirement. The doctor who is an automatic prescription writer, who merely feels the pulse, observes the temperature, formulates a chemical concoction, and disappears, forgetting to devote at least as much time to the mental, the psychical construction of the patient—the doctor, in brief, who treats every patient as a "case," without an attempt to lend cheer and delight to the patient's social atmosphere, and make the sick one delight in his presence, is lacking at least fifty per cent. of the qualifications of his calling. The careful medical

man will last of all give a prescription. He will include in his history of the case an inquiry into the habits of regularity, frequency, and quality of food or drink, the rapidity of mastication and deglutition; he will inquire regarding sleep, dreams, nature of vocation and avocation, rest, exercise, social relationships, petty hobbies, etc. He will take nothing for granted. Speaking of inquiry into the habits of the patient reminds me of the case of a young woman who was sent to me for treatment of "nervousness." She had been going the rounds and had visited many specialists, but she was as nervous as ever, and vowed that if I could not cure her, she would cease doctoring, as she was "disgusted with medicine, anyway." I permitted her to have her say, and she kept on describing her various complaints, the twitching of the muscles, insomnia, bad dreams, indigestion, headaches, palpitation, loss of weight, and much more, and she finally stopped. I noticed that, while taking a deep breath during her rapid flow of exuberant verbosity, she was chewing something. My first question was: "Madam, may I know what it is that you are chewing?" She flushed a little, smiled, and said curtly: "No, it's not gum, doctor, it's just these," and opening her pocketbook, she produced a half dozen coffee beans for my scrutiny! My diagnosis was made without further ado. "How much coffee do you take in twenty-four hours?" I asked. "Oh, not much. You see, they help to quiet my nerves! About two cups, sometimes more, at each meal; when I feel real bad, I take a cup or two between meals. When I am not home, why I just chew it; it is better than all the medicine you doctors have ever given me!" It was plain that here I was dealing with a coffee fiend, a coffee drunkard, an individual whose mental process works backward. Instead of recognizing coffee as the cause of her trouble, she thought she fostered was the opinion that eight, ten, or twelve cups of coffee, plus chewing it dry, was her panacea! The successful appeals to her reason, after considerable trials and tribulations, finally cured this mademoiselle of her "nervousness."

We medical men, ordained to minister to our fellows from the first cry of life, through infancy, childhood, puberty, adolescence, manhood and womanhood, even to the sigh of the parting breath, must ever bear in mind the psychic factor, the mind, as deserving of quite as much consideration in the alleviation of suffering, as the body. The restriction of the use of drugs to cases primarily organic in nature, the administration of proper doses of sympathy, smiles, encouraging demeanor, and an attempt to reconcile cause and effect by sane efforts, even though this entails a psychological appeal to husband, wife, parent, or friend, as the case may be—this is truly the field of the physician who aims to make his life's work replete with happiness to self and to those whom he is called to assist. Such a man, a past master in the understanding of unpolished human character and temperament, the mind in its extreme trials, feelings, and passions, suppressed and expressed, stands out from human society as a distinct entity, and is esteemed and respected by his fellows as the superman.

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THE STATIC LABYRINTH.*

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The labyrinth, or inner ear, is an organ of two distinct mechanisms and functions, viz., the cochlea, or the essential organ of hearing, and the static labyrinth, the essential organ of equilibration and orientation. It is with the latter that this paper deals.

The static labyrinth, composed of the three semicircular canals, the saccule, and the utricle, with their intracranial pathways, i. e., the nerve pathways from the ear to the cerebral cortex, including their branches and subdivisions, constitutes the vestibular apparatus or balance mechanism, of which the vestibular portion of the inner ear is essentially the end sense organ. The ear is not the only organ of equilibrium. It is in intimate connection with other special senses, such as sight, touch, muscle and joint sense. The end organ of the static sense differs from the others in that its only function is that of the maintenance of balance, while with the others that is merely a collateral function.

The equilibrium of the body is maintained by the harmonious cooperation of these senses, but depends chiefly upon the vestibular apparatus. Whenever perfect equilibration is interfered with, a motor sensation is perceived within the brain known as vertigo. In searching for a cause for vertigo it is toward the chief end organ of equilibration, the inner ear, that attention should be directed. While the labyrinth is but one portion of the vestibular apparatus, it is clear that examination of the function of the labyrinth by appropriate tests will at the same time afford valuable information regarding the condition of the brain paths and brain centres in close relation to the internal ear.

A disturbance of any portion of the vestibular apparatus, irritation, impairment, or destruction will give rise to vertigo. A man suddenly deprived of one labyrinth is temporarily greatly upset in his sense of position; as a result he has violent vertigo, which his other senses make frantic efforts to correct. He has illusions of motion, his eyes fix upon an object and follow it until it is apparently out of the field of vision, snap back and fix again, and so on, producing the rhythmic oscillations called nystagmus. The whole musculature of the body in response to the sensation of being turned in space, makes an effort to resist the movement. This violent effort to correct a change of position which is not actual, results in a loss of equilibrium. Gradually these symptoms disappear, although his orientation, if his labyrinth has been destroyed, will never again be perfect, any more than a person with one eye can see perfectly, or a person with one totally deaf ear can hear perfectly, binocular vision and binaural hearing being essential to perfect judgment of distance. Just so perfect orientation or equilibration requires angulation and equal impressions must come from the two different vestibular apparatus at the same time.

The tadpole deprived of its vestibular apparatus sinks to the bottom and lies there inert. The dog-

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fish, deprived of his, still makes efforts to swim and maintain existence, but is quite indifferent whether he is placed on his back, his belly, or his side, and makes his efforts in such position, without attempting a change; he has lost his sense of position, his power of direction. A pigeon deprived of its vestibular apparatus in time learns to stand, walk, hop, and eat with a certain amount of imperfection, but he never learns to fly again. Apparently his orientation is never compensated sufficiently for this more difficult task, which he normally accomplishes instinctively. So, too, in time a man deprived of his vestibular apparatus learns to get along quite well in the ordinary every day pursuits of life, which only goes to prove that certain other faculties, e. g., the so called muscle, joint, and tactile senses and the sense of sight have so enlarged their scope as to compensate for that which he has lost.

It is interesting in this connection to note that one who has been deprived of the function of his labyrinths, e. g., certain deafmutes, for obvious reasons never experiences the throes of seasickness. Put such a person under unusual conditions and he will immediately meet with trouble. Swimming under water even in the expert becomes an impossibility, because he is now entirely dependent upon his labyrinths for his knowledge of his position and direction. Let him become an aviator. He might get along fairly well as long as he could rely upon his other senses, especially sight, for his orientation. If he should fly at night, however, or enter a dense cloud, he would not be able to tell whether he were flying toward heaven or earth, right side up or upside down. Hence the importance of tests in recruiting for the aviation service.

Artificial stimulation of the vestibular apparatus can be produced in three ways, viz., galvanic current, caloric tests, and the Bárány turning tests. It has been proved by numerous investigators, chief among them Robert Bárány, that in the normal individual stimulation of the static labyrinth gives rise to certain subjective and objective symptoms, viz., nystagmus, vertigo, pastpointing, falling, etc., that these reactions are invariably produced, and that they are invariably the same. The physiology of the static labyrinth briefly stated is as follows: Circulating within the semicircular canals and the vestibule is the fluid endolymph. In certain spots, the cristae acousticae of the canals and maculae acousticae of the saccule and utricle the lining membrane is provided with highly specialized epithelial cells known as the hair cells. Movement of the endolymph is taken up by the hair cells, and carried to the vestibular branch of the eighth nerve and thence to its ultimate destination.

Vestibular nystagmus is a rhythmic to and fro movement of the eyeballs consisting of a slow drawing of the eyes in one direction and a quick return. The slow component is vestibular in origin, while the quick return is central or cerebral. That this is true is proved by the fact that if the static labyrinth is stimulated in an anesthetized person, the eyeballs are drawn to one side without any quick return, resulting in a conjugate deviation instead of a nystagmus. Unfortunately the direction of the nystagmus very incorrectly takes its name from the

direction of the quick or cerebral component, whereas it should take its name from the slow or vestibular component. The nystagmus is always in the same plane as that of the semicircular canal being stimulated. Stimulation of the horizontal canals produces a horizontal nystagmus to one side or the other, while stimulation of the vertical canals produces a rotary nystagmus to the right or left.

Each semicircular canal has at one extremity a small or smooth end, and at the other a bulbous enlargement known as the ampulla. Ewald by his experiments formulated the theorem that in the horizontal canal movement of the endolymph from the small end toward the ampulla is the more effective and causes a nystagmus to the same side, the slow or vestibular component being toward the opposite side; whereas movement from the ampulla toward the small end is the less effective and causes nystagmus to the opposite side. In the case of both vertical canals, just the opposite is true, movement from the ampulla toward the small end being the more effective, etc.

The more effective movement of the endolymph causes a reaction of the adductors of the eye on the same side through fibres of the oculomotor nerve and the abductors on the opposite side through fibres of the abducens, producing a nystagmus with the vestibular or slow component toward the opposite side, and quick or cerebral component toward the same side, i. e., a so called "nystagmus toward." Since stimulation of the labyrinth causes movement of the eyes, it would seem that there must be some definite nerve pathway, the vestibulococlear tract, from the ear to the eye muscles; and since stimulation causes vertigo, there must be a definite nerve pathway, the vestibulocerebellocerebral tract, from the ear to the cerebrum. It is thought by some that nystagmus and vertigo are the only two reactions produced by labyrinthine stimulation and that pastpointing and falling are secondary to, and a result of, the vertigo.

The deductions of the department of neurology of the University of Pennsylvania regarding these pathways in detail are as follows: The fibres from the horizontal semicircular canals pass through the eighth nerve to the brain stem and enter Deiter's nucleus in the medulla oblongata. At this nucleus the fibres divide, going on the one hand to the posterior longitudinal bundle, through which they are connected with the various eye muscle nuclei, to be distributed through the third, fourth, and sixth nerves to the eye muscles themselves. It is this pathway that is responsible for the eye movement. The other pathway goes from Deiter's nucleus through the inferior cerebellar peduncle to the cerebellar nuclei of the same side, from which it proceeds through the right superior cerebellar peduncle to the decussation of the two superior cerebellar peduncles in the base of the cerebral crura. From this point there are two pathways to the cerebral cortex of both sides, but the main pathway goes to the cortex of the opposite side. The cortical centres that receive these fibres are postulated by Mills to be in the posterior portion of the second temporal convolutions adjacent to the cortical areas for hearing. It is this pathway from the horizontal canal

to the cerebral cortex, passing through the cerebellum, that is responsible for the production of vertigo on ear stimulation.

The fibres from the vertical semicircular canals have a different pathway after entering the brain stem, ascending in the pons to a point above the middle of the pons. At this point the fibres divide, on the one hand going to the posterior longitudinal bundle, to be distributed to the eye muscles; on the other hand entering the cerebellar nuclei through the middle cerebellar peduncle, from which point their pathway is the same as that of the fibres from the horizontal canal. By the vestibular apparatus, then, we mean the static portions of the inner ears and all of these various nerve pathways from the ears through the brain stem, cerebellum, and cerebrum. While the definite locations of these tracts have been assumed, and quite properly too, from evidence based upon clinical findings, they should be held tentatively until a greater volume of pathological data has been accumulated.

Galvanic current.—In the normal individual a current strength of four milliamperes, with the cathode in contact with the ear and the anode in the hand, produces a rotary nystagmus toward the same side; with electrodes reversed there is nystagmus toward the opposite side. The objection to this test is that it stimulates not only the entire labyrinth, thereby making tests on individual canals impossible, but the eighth nerve as well. Its chief use is to detect a functioning eighth nerve in a case where the labyrinth is inactive.

Caloric test.—This consists of douching the ear with either hot water, 112° F., or cold, 68° F., the latter being the one usually employed. It is based upon the physical law that heat causes a current upward and cold causes a current downward. In this way a movement of endolymph can be set up in the semicircular canals. In order, then, to get a current up or down, the head must be placed so that the canal which it is desired to test is in the vertical plane. In the erect posture it is obvious that the horizontal canal would least participate in such a movement. Inclining the head forward thirty degrees, depressing the chin, puts the anterior vertical canal directly in the vertical plane. This is the usual position employed, and hence it is the function of the vertical canals which is demonstrated in the caloric test in the erect posture. In the normal individual forty seconds of douching will produce nystagmus, and the nystagmus will have an average duration of about two minutes. Cold water, then, will set up a current of endolymph in the anterior vertical canal from above downward, i. e., from the small end toward the ampulla, the less effective movement in the vertical canals, with a production of a rotary nystagmus toward the opposite side. Warm douching will cause a current upward, i. e., from the ampulla toward the small end, the more effective movement, and will result in a drawing of the eyes toward the opposite side, the slow component, by the adductors of the eye on the side tested and the abductors of the other eye as a result of vestibular stimulation; with a quick return, the cerebral component. The result is that there is pro-

duced a so called "nystagmus toward" the ear in question.

The direction and character of the nystagmus can be changed by altering the position of the head so as to bring the different canals into the vertical plane. For example, if after obtaining a rotary nystagmus to the right as a result of cold douching of the left ear in the erect position with head inclined forward thirty degrees, we should bend the head backward sixty degrees, the type of nystagmus would be changed from rotary to horizontal, because it is now the horizontal canal in which the endolymph movement is set up, on account of its being placed in the vertical plane. If we bend the head 120 degrees forward, not only the type of the nystagmus would be changed but its direction as well, because the movement of the endolymph is now from the small end toward the ampulla, the more effective movement in the horizontal canals. Hence there would result a horizontal nystagmus toward the left. Vertigo, with its resultant pastpointing and falling is likewise produced, and can be tested in the same manner as after the turning tests which follow.

The chief advantage in the caloric test over the turning tests is that it permits of an examination of one labyrinth at a time, which is obviously not so in the latter, and an analysis of the function of its canals separately. On account of the ease of its performance, lack of discomfort to the patient, and accuracy, as a routine measure the turning tests are usually employed.

Bárány turning tests.—In an appropriate chair, the Bárány revolving chair, or some modification, the patient is seated, eyes closed, and head inclined forward thirty degrees and revolved ten times to the right occupying twenty seconds, two seconds for each revolution, and stopped. He is then directed to look straight ahead at a distant object. There will be produced a horizontal nystagmus to the left which will last in the normal on the average twenty-six seconds; ten seconds variation either way is permitted. This is due to a movement of endolymph in the horizontal canals, which continues for a while after the chair has been stopped. In the left ear the flow is toward the ampulla, the more effective movement, producing a horizontal nystagmus to the same side, i. e., the left; in the right ear, of course the flow is toward the smooth end, the less effective movement, producing a nystagmus toward the opposite side, which is also the left. The ratio of the stimulus from either side is believed to be about two to one. If, for example, after turning to the right the patient exhibits an after nystagmus to the left of, say, eighteen seconds, and after turning to the left a nystagmus to the right of, say, nine seconds, the inference is that the right labyrinth is non-irritable; i. e., its function has been destroyed or abolished. In such a case resort would be made to the caloric test, in which one ear at a time could be tested.

The subjective symptom of vertigo can be tested in a similar manner by having the patient tell the examiner in which direction he thinks he is being turned. The plane of the vertigo is always in the plane of the canal being stimulated and in opposite

direction to the movement of the endolymph. Upon being turned at uniform speed, one revolution a second, he will say, "To the right," and upon stopping after ten turns, he will say, "To the left," on account of the fact that the flow of endolymph continues for a while after the chair has stopped, until after an average of approximately twenty-six seconds he will say, "I am standing still." This test is not necessary as a routine measure.

Inasmuch as pastpointing, as well as falling, is secondary to, and a result of, the subjective symptom vertigo, it affords an excellent and convenient quantitative objective measure of the same. The normal individual with eyes closed, after touching a point with the tip of the index finger, can with elbow extended raise his hand above his head or to the side, etc., and bring his finger back to the same spot with very slight variation. If he is now turned ten times to the right in ten seconds and stopped, he will pastpoint to the right with either hand; very decidedly the first time. This is because he thinks he is being turned to the left, and in an effort to overcome a movement which is not actual he points too far to the right. The second time the pastpointing is less, the third less still, and on the fourth attempt he usually again touches the point.

Falling after turning results from a subjective sensation of being turned in the vertical plane. Turning with the head erect, i. e., thirty degrees forward, stimulates the horizontal canals and causes the sensation of being moved in a plane parallel with the floor, hence no falling. Turning to the right five times in ten seconds with the head bent forward ninety degrees, the usual test, or backward, will cause the patient upon attempting to resume the erect position after the chair is stopped, eyes closed, to have the sensation of being turned in a plane at right angles to the floor, and he will fall to the right. In these tests in order to avoid confusion, the turning has always been to the right. When the patient is turned to the left, the resultant reactions are in just the opposite direction to those given above.

Before testing for nystagmus the patient is directed to look straight ahead at a distant object. Any spontaneous nystagmus under these conditions is pathological. He is then told to look to the extreme left and then to the right. A certain amount of lateral nystagmus toward the right when the gaze is toward that side, changing to a nystagmus toward the left when the gaze is shifted to that side, is physiological. With the eyelids held far apart he is then caused to look directly upward and then downward in an effort to detect any spontaneous vertical nystagmus, which is considered practically pathognomonic of involvement of the brain stem either by pressure or infiltration.

The symptom most complained of, for the discovery of whose cause the ears are tested, is of course that of vertigo. Vertigo may be caused by: 1. Primary disease of the labyrinth, labyrinthitis of the various types, hemorrhage or effusions; embolus of the labyrinthine artery, e. g., air embolus in caisson workers; irritation of the labyrinth occurring during a middle ear inflammation, such as acute otitis media; sudden destruction of the labyrinth, rarely by trauma, but usually by hemorrhage or

serous effusion, in diabetes, Bright's disease or where the vascular system is affected; neuritis of the eighth nerve resulting from some chronic focus of infection, such as chronic disease of the faucial tonsils, pyorrhæa alveolaris, etc.; most frequently of all a primary chronic degenerative process within the labyrinth, independent of syphilis or infectious fevers. 2. Toxemias affecting the vestibular apparatus, such as ptomaine poisoning, constipation, alcohol, quinine, tobacco, leadpoisoning, nephritis, gout, rheumatism, syphilis, and infectious fevers such as scarlatina, typhoid, mumps, etc. 3. Definite lesions within the brain itself along the pathways from the ear, such as tumor, hemorrhage, thrombus, infarct, abscess, gumma, tubercle, specific neuritis, multiple sclerosis, syringomyelia, polioencephalitis, or meningitis.

The information to be derived from the ear tests consists of the presence or absence of normal reactions, or their deviations from the normal. If after stimulation, there occur no reactions whatsoever, no nystagmus, no vertigo, no pastpointing, no falling, etc., the lesion is either in the labyrinth or the eighth nerve. If stimulation of the labyrinth evokes perfectly normal responses, nystagmus and vertigo, there is evidently no impairment of the vestibular apparatus, and if it is for a cause of dizziness that we are searching, we must look elsewhere for something that is producing an irritation of the balance mechanism. If any of the responses goes through normally, the labyrinth and eighth nerve as the seat of the lesion are eliminated. If stimulation of the ear fails to produce any nystagmus, there must be a lesion along the pathway from the ear to the eyes, in the vestibulococlear tract. If no vertigo results, there is a lesion along the pathway from the ear to the cerebral cortex, the vestibulocerebellocerebral tract.

If, after stimulation, the patient shows nystagmus and no vertigo or vertigo and no nystagmus, the lesion is not labyrinthine. The presence of normal nystagmus with absence of vertigo would indicate a normal tract from the ear to the eyes, but an involvement of the other pathway, the one from the ear to the cerebrum, after the two have divided into their individual tracts, i. e., between Deiters's nucleus and the cerebral cortex. The presence of a normal vertigo and the absence of nystagmus would indicate a lesion along the fibres going to the eye muscle nuclei at some point beyond the division of the two pathways into their individual tracts, i. e., between Deiters's nucleus and the posterior longitudinal bundle.

In conclusion, then, let us briefly summarize as follows: The static labyrinth is the essential end organ balance.

The labyrinth, together with its various nerve pathways, constitutes the vestibular apparatus or balance mechanism.

A disturbance of any portion of the vestibular apparatus gives rise to vertigo.

It is only a disturbance of the ear or its associated pathways, and nothing else, that can induce vertigo. When disease in remote organs causes dizziness, it is only because of a definite influence on the ear mechanism.

In these tests we now have an accurate and scientific method of determining the integrity of the internal ears, the eighth nerves, and the pathways through the medulla oblongata, the pons, the six cerebellar peduncles, the cerebellum itself and the cerebral crura to the cerebral cortex.

In cases of vertigo of doubtful etiology examine the vestibular apparatus.

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THERMOTHERAPY IN GONORRHEA.

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Of the three diseases of the venereal triad—syphilis, chancroid, and gonorrhea—the last is by far the most difficult to cure. The force of this assertion is brought home when we consider the large number of remedies that have been and still are being used to treat it. It is an axiom of medicine that where many remedial measures are offered for a disease that disease is always extremely resistant to them. No one can deny this of gonorrhea.

With the discovery of the gonococcus by Neisser in 1879 the treatment of the disease passed from an empiric to a rational basis. After the lapse of nearly forty years, and in spite of the great advances made since then, there is still much to be desired in the treatment of this well nigh omnipresent disease. Janet, of Lyons, about 1890 introduced the method of irrigation with hot potassium permanganate solution and this, with the modifications of Valentine and Chetwood has remained the same as well as the best now at our command. Since then the introduction of organic silver compounds has been, with the possible exception of vaccines and serums, the only advance until quite recently. The advent of the great war and the enormous increase of venereal disease consequent to the gathering of armies, has caused a renewed interest in this the most widespread as well as the most disabling of venereal diseases and results from treatment are promised hitherto deemed almost impossible.

At the beginning of this renaissance as it were, the Italian Tomiselli, with the antiseptic theory still strongly influencing him, experimented with electrical colloidal silver. He injected the solution directly into the tissues, because, as he stated, the silver exerted a direct antibactericidal and antitoxic action. Tomiselli claimed by this method to abort acute gonorrhea. Chronic cases did not respond so readily, yet they, too, gradually cleared up. In epididymitis he found his method especially efficient; the inflammatory swelling rapidly declining and the calibre of the vas returning to its former patency and able to function as before, a result rarely achieved by any other measures previously em-

ployed. Workers along similar lines as those of Tomiselli have used colloidal iodine suspended in an oily menstruum with similar favorable results. This sums up all that has been done in the way of direct antiseptic medication which until a very recent date has been the universally accepted method of combating the disease.

The impetus of war has also caused an increased activity in the field of serotherapy and vaccino-therapy, which had lately fallen into a state of innocuous desuetude, due more or less to the indifferent and puzzling results so often obtained. The close resemblance which the gonococcus bears to the meningococcus led Pessary and Chauvet to experiment with antimeningococcic serum in the treatment of gonorrhea. They claimed excellent results in various forms of gonorrheal infection, as did also Dopter working independently. Their treatment had many drawbacks, however, not the least of which were severe serum reactions and anaphylactic shock and no perceptible shortening in the length of time required to effect a cure. By reason of this they discontinued their investigations and their method has not gained a place in the therapeutics of the disease.

Treatment by vaccinotherapy was the next step in advance from serotherapy. Both autovaccines and heterovaccines have been used. Vaccines are usually given subcutaneously, although some claim better results by the intravenous route. The injections are given at intervals of from eight to ten days. The frequent violent reactions which have followed their use have caused many to be somewhat cautious in advocating their employment. These reactions have been attributed to the sudden and overwhelming liberation of specific endotoxins, although I might add in passing that in my opinion the introduction of a foreign protein into the bloodstream has also much to do with it. Indeed it has recently been stated by competent authorities that it is the horse serum used as a vehicle, more so than the dead organisms that is responsible for the curative effect as well as for the anaphylactic action. I am inclined to believe that this explanation is correct.

To overcome these untoward reactions Besredka succeeded in neutralizing the endotoxins while retaining the cocci in the living state. In spite of the highly interesting technic whereby this was accomplished he was forced to admit that the cocci eventually regained their power of forming endotoxins. With the same object in view, Nicolla and Blaizot prepared a stable and nontoxic vaccine of dead cultures comprising all of the urethral flora. This, when diluted and given intramuscularly, did not give rise to a severe reaction; however, when administered intravenously the reaction was so violent that they discontinued its use. My own experience has been similar to theirs; I can recall two cases in which the anaphylactic shock was so great that only the most heroic measures prevented a fatal termination. Vaccines have been administered with beneficial results in gonorrheal ophthalmia, orchitis, and salpingitis, but the combined experience of many careful observers are united in agreeing that they are practically useless in the acute form of the disease. Personally I have long discontinued their use.

Recently a form of therapy in the treatment of gonorrhea has been advanced which is most hopeful. While yet still in the experimental stage both in theory and practice it bids fair to revolutionize all preconceived ideas and methods of treatment in the length of time to effect a cure and the absence of secondary complications. I refer to thermotherapy, local and general.

Nearly sixty years ago in eastern Europe it was the custom amongst soldiers suffering with acute gonorrhea to place the penis between two hot roof tiles as long as the heat generated therefrom could be borne. The results were "inflammation, swelling, and pain" of the organ, but the purulent discharge promptly ceased and in a few days the disease was apparently cured. With this fact as a starting point in the practical application of the theory of local thermotherapy, Porosz experimented with a combined thermal and hyperemia treatment. He obtained this effect by means of hot sounds and with good results. Brick, as far back as 1891, shortly after the introduction of Janet's hot permanganate irrigation method, used hot sounds in the treatment of stricture and chronic urethritis. By a strange coincidence, Oberlander twenty years later recommended this treatment for postgonorrheal neuroses. In 1903 Marcus devised a urethral electrode for the purpose of heating the urethral mucous membrane and thereby destroying the gonococci lodged therein. His apparatus was cumbersome and complicated and unfit for practical use. With it he discovered that the urethra could stand a temperature of 50° C. or 122° F. without discomfort or reaction. He also noted that this temperature had a decided sedative effect upon the inflamed mucous membrane. He employed no local anesthetic before introducing the electrode and his treatment was directed entirely toward chronic cases; he advised against its use in acute cases.

Kjaw, of Dresden, experimented with irritating sounds, using hot solutions after the manner of Janet. He did not find them successful. About the same time Finger carried on a series of experiments in which he demonstrated the extremely low vitality of the gonococcus. The observations of this eminent urologist led to continued and more systematic investigations of the possibilities of thermotherapy. Finger demonstrated that a difference of but 1° made a vast difference in the effect produced on the gonococci; the effect at 40° C. being twice that at 39° C. In 1910, Schminke used thermal penetration in the treatment of gonorrheal arthritis. He employed a temperature of 45° to 48° C. and his success in these conditions caused him to treat prostatitis and epididymitis in a similar manner. At first he used flat electrodes which invested and conformed to the shape of the parts affected, but later he discarded these as expensive and dangerous. He then developed an irrigation apparatus which enabled him to raise the temperature of the irrigating fluid to 50° to 52° C. This proved perfectly practical and he employed it chiefly on old, chronic cases which had resisted previous treatment. He makes no mention of the treatment of acute cases. In the United States, the work of Fulton deserves mention. He uses a hollow sound, as was originally

suggested by the late Doctor Valentine, through which water, heated to a temperature of 119° to 120° F., flows for half an hour. The urethra is anesthetized with stavaine or cocaine. Fulton claims that one treatment will change a purulent discharge into a watery one and a cure is effected in from twelve to fourteen days.

This sums up about all that has been done in the direct application of heat in the treatment of gonorrheic conditions. In so far as the acute disease is concerned, thermotherapy has hardly had a trial and in the chronic form its success must be demonstrated still further before it can be recognized as a standard method of treatment. Yet a beginning has been made—and a good beginning I may say—in the realization of heat as a powerful therapeutic agent in the treatment of the disease and it has led others to continue the search for a more potent method of its application. This seems to lie in the direction of systemic thermotherapy, or the destruction of the gonococci buried locally in the urethra or its anexa and the endoxins generated by them in the blood.

It has long been known that pyrexia, especially if high, will cause an abrupt cessation of a gonorrheal discharge. In typhoid and pneumonia this has been noted time and again. It has also been observed by Finger and others that an individual with a high fever cannot be inoculated with gonorrhea. Muller and Weiss have experimented with artificially induced fever in the treatment of gonorrhea but owing to the war their conclusions are at present inaccessible. This is to be regretted because I understand they are extremely interesting and contain matter of great value. However, it has been possible for me to gain access to the report of Duncker who has combined the fever therapy of Weiss and Muller with injections of hot Dakin's solution combined with an infusion of chamomile or *uvæ ursi*. His technic is complicated and the temperature to which the patient is subjected is in many instances hard to bear. He raises the body temperature slowly and under pulse control, which he does not allow to exceed 130 to 140 beats per minute. He claims to reduce by one-half the time usually required to effect a cure and to abort the disease in a large percentage of cases.

The inference to be drawn from this brief resumé of systemic thermotherapy is that it is an important adjuvant to local thermotherapy. The ideal treatment would seem to be a combined local and systemic raising of the body heat. One to destroy the organisms *in situ*, the other by producing the necessary changes in the blood to destroy the toxins circulating therein. Thermotherapy in the treatment of gonorrhea offers a fertile field for clinical research. From what has already been done it seems almost as if a means of cure for this disease was on the verge of being found.

Before bringing this communication to a close I desire to say that for some time past I have been employing a very simple measure—one within the reach of all—to assist in the routine treatment I employ, which consists in hot permanganate irrigations and massive doses of santal oil; this is the ordinary Turkish bath. All cases of gonorrhea

coming to me I have had take such a bath several times a week; the patient being directed to remain in the hot room as long as possible and to abstain from cooling off afterward. When this has been done I have found the disease invariably modified and the symptoms reduced to a minimum. I cannot say, however, that I have noted any decrease in the length of time required to effect a cure, yet since employing this measure I have noted none of the complications such as epididymitis or posterior urethritis such as otherwise occur even in the most carefully treated cases.

This small beginning has encouraged me to go further and at the proper time I hope to be able to report results of a more definite nature.

1632 AVENUE A.

A TREATMENT FOR INEBRIETY WITH THE QUARTZ ULTRAVIOLET LIGHT.

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Various theories and practical methods regarding inebriety therapy have been advanced. The only permanent, lasting cure, however, that has stood the test of years is spelt in four letters: it is s-t-o-p! It has proved itself to be the only safe trail for the patient. For it, and it alone, leads out of the woods permanently to the free, open country of normal mental and physical health. Whenever one afflicted with drunkenness applies this permanent, lasting stop cure the results are sure and complete. They are likewise astonishingly quick. The patient gets a new grip on himself. His mental microscope becomes adjusted to the normal perspective of things as they are, not as he wishes them to be, and the patient is able to let liquor alone permanently.

There is a stumbling block, however, which we must recognize. We must devise practical measures that will steer the patient safely by the rocks of failure. How can this be done? How can a sure relief be effectively brought about? Astounding as it may seem, it can be achieved in three days in the patient's own private home or hotel room. I make this statement upon a basis of fifty inebriety cases thus far treated since June, 1916. I will make another statement also: Any physician armed with sufficient courage and intelligence and the ability to apply scientifically both of these qualities can effectively relieve inebriety in three days. The patient is then in such improved mental and physical condition that he can automatically cure himself if he actually determines to do so. This entire problem of inebriety is not only a direct challenge to physicians, but to the patient himself.

Some one has classified inebriety patients in four types: the chronic alcoholic, the periodical alcoholic, the accidental drunkard, and the idle sons of the wealthy. The last have learned how to loaf gracefully. It is natural that they should take up cigarettes, alcohol and all the other vices that may come handy. They have a lot of energy and a lot of money, and they feel like using both. When the

art of graceful loafing is adopted by many of these idle wealthy individuals, many of them quite naturally permit the toxic effects of alcohol to accumulate within their tissues.

In this handling, therefore, of the problem of inebriety among the last class as well as the other types there are two clear cut factors that must be recognized. One is the brain of the patient, the other is the body of the patient. In this article I shall confine myself especially to the technic and method of procedure employed by myself in handling the physical maladjustment, and to a minor extent the psychic status. The details of my technic can be and will be altered and improved by my colleagues. Their fundamental virtue is that they will work quickly and effectively if courageously and intelligently applied.

In the first place, when I am summoned to the bedside of an alcoholic, the problem presenting itself is considered purely as a physical one. The patient wants to get helped back to his normal condition promptly, and if he is not too drunk he will so express himself to the physician. Talk is therefore unnecessary—at least during the first eighteen hours. My motto is: "Do it first; if necessary, talk about it afterward." Promptly, the patient and I start right in. Experience with this technic has taught me that the best thing about treating inebriety in this manner is that it works.

I wish to repeat that there is much room for improvement in my technic and also that it affords any physician a specific basis upon which he in his own practice can start from in a constructive way. My technic is as follows: The patient's blood pressure is taken. His heart and lungs are examined. If the findings are not too abnormal, the patient is usually given anywhere from 0.1 to one third grain of apomorphine hydrochloride by hypodermic injection. This begins to operate within three or four minutes. The patient goes into shock, with violent vomiting, cold extremities, slow heart beat and profuse perspiration. Often he thinks and says that he is going to die. After vomiting, there follows almost always a period of deep sleep. It is during this interval that I employ the vitality producing photochemical effects of the quartz ultraviolet light. This produces a sunburn. The degree of the sunburn depends upon the dose.

With the patient lying asleep in a prone position, I give him a highly penetrating dose of the quartz light deeply into the skin of the spine. I begin at the occipito-cervical vertebra region. The dose is regulated according to the texture of the skin and the general health of the patient. In some cases the focal centre of the light as I employ it by Nagelschmidt's modification of the quartz mercury arc is gauged at twelve inches for thirty minutes in one spot. In other instances where experience has taught me to go more cautiously, especially in very low blood pressure cases, the dose is given at eighteen inches for twenty minutes, which equals one third the dosage at twelve inches for thirty minutes. Usually I give three exposures to the spine at the above varying intensity dose for thirty minutes each, the first on the cervical spinal, the second on the dorsal, and the third covering the lumbar spinal area.

The immediate effect of the light usually deepens the patient's sleep. At the end of two or four hours after the first hypodermic injection of apomorphine I immediately give a hypodermic dose of pilocarpine hydrochloride from 0.1 to 0.2 grain. This dose depends on the blood pressure, pulse, and general physical condition of the patient. The weaker the condition the less the dose. The pilocarpine injection soon produces a profuse perspiration, often accompanied by sleep. More frequently, however, nervous symptoms appear. To lessen and quiet these I have the patient put in a warm bath, temperature 105° to 110° F., and from twenty to forty minutes. The body is completely immersed up to the chin and the patient's body is not removed from the bath until the pulse begins to climb above 120.

Four or six hours after the pilocarpine injection a dose of eserine salicylate is given hypodermically, varying from 0.02 to 0.04 grain. Up until this time the patient may or may not request further drinks of alcohol. As soon as the eserine begins to operate the patient will in nine cases out of ten remark that he never wants to see or smell another drop of alcohol. If a glass of liquor is produced he will spurn it with disgust. If he does not spurn it he needs more eserine. Eserine will make him surrender his fixed idea or obsession that he must have another drink of liquor. The proof of the pudding is in the eating. Let any physician try this out and prove it for himself. Eserine makes good. The patient is loath to believe his own senses. He is subtly, yet tremendously surprised. To the physician a really comical psychological stage occurs in the patient during this transition process. The action of eserine tightens up all the involuntary muscles of the body. The patient will usually complain of feeling very queer and markedly nauseated. He may vomit at any period after the eserine. Cracked ice should be forced at the earliest moment after the pilocarpine injection together with all the plain or carbonated water that the patient can be persuaded or forced to drink. I have had cases where I have known the patients to have actually consumed four gallons of water within four hours, beginning from the first injection of pilocarpine.

Six hours after the application of the quartz light a generalized sunburn erythema of the entire spine and dorsal skin of the spinal region will begin to appear. This will increase rapidly for twenty-four hours. To avoid sunburn blisters plain boric acid powder should be gently and thickly applied every two hours to the sunburned tissues. During the first twenty-four hours of treatment I give my patients anywhere from four to six baths at a temperature of from 105° to 110° F. The body is totally immersed. This likewise helps to obviate the sequelæ of sunburn blisters. It acts also in a stimulating capacity to the sweat glands with their eliminative functions.

After the acute unpleasant effect of the eserine has worn off there is another drug that I use in about fifty per cent. of cases. It is ten drops of croton oil, administered in a gelatin capsule. At the end of eighteen hours after beginning treatment, the eliminative channels of the patient's body have become pretty thoroughly cleansed of the

alcohol toxin. The brain cells are then able to function in a way approaching the normal. Rational mental poise begins to come back with a rush. It is almost unbelievable to the patient. His surprise will usually be expressed verbally, so unusual is it to him that his craving for liquor has been temporarily eradicated. The patient will complain of being extremely nervous, faint, and weak. He will likewise be considerably surprised at the acute effects of the sunburned back, the tissue metabolism of which has been stimulated to a most high degree. Just as soon, however, as the patient's alimentary canal has begun to throw off the irritating croton oil and he shows the keenest thirst, the quantity of liquid and cracked ice should again be pushed to a maximum. Milk should now be used in addition to water. The essential nourishment contained in milk should be started during the last two or three hours of the first twenty-four. I give my patients from one to three quarts of milk during this period, and no other nourishment. The milk is administered as hot as the patient can drink it.

The second twenty-four hours usually finds the patient in a more or less remorseful and morose condition. The day is started with a bath. After this the diet again consists of all the milk the patient can drink either hot or cold. The treatment on the second day is boric acid applications on the sunburned skin of the back. There won't be much request for liquor. Usually there is none whatever. Shock always accompanies this sunburning treatment. This is a vital point. The more severe the treatment the greater the shock, because of the absorptive and toxic photochemical reaction occurring in the aminoacids, phenylalanin, and tyrosin of the cellular protoplasm proteins. I have seen one patient's blood pressure drop seventy millimetres of mercury at the end of the first twenty-four hours following an intense sunburn therapeutic application. At this stage, during the second twenty-four hours, the patient's mind begins to come back. Here it is that the patient's common sense, his intelligence and self-esteem are asserted. He gets a new mental angle on himself and his actions. It is just here that the transition stage from the physical into the realm of the mental occurs. Here also the treatment of inebriety likewise changes from a purely physical to a mental one. If the patient has any will at all, he will now of his own intuition decide that it does not pay to drink. He determines once again not to drink. With common sense and plain, man to man fellowship on the part of the physician, his own judgment is strengthened and he grows equal to the task of stopping.

Of course, there is no medicine under the sun that can be administered to a human being that will take the place of his own will power and his own manhood. There is no code or system nor talk that can be given to an inebriate as a substitute for this mental will power or manliness until his glands and tissues are free from the accumulated alcohol toxin. Will power and manhood qualities are elemental factors in the makeup of each one of us that determine our own individual characters. By first thoroughly cleansing the body of the alcohol toxemia, by uncorking, as it were, the poisonous waste products from among the glandular tis-

sues that alcohol leaves in its trail, the patient has secured a good start ahead. He then has a good chance to increase his momentum toward health and abstinence.

Why, therefore, in our treatment of inebriety, should we compromise or continue to drive the patient's metabolism in a vicious circle by feeding any liquor at all once the treatment is commenced? In my personal work and study of these patients I have not found this plan of liquor feeding to be beneficial. It is sometimes impossible to be too arbitrary in the beginning stages of inebriety treatment as regards the liquor. It is sometimes necessary to compromise. It is, however, merely a compromise until the patient's confidence is completely won and the eliminative drugs have fully performed their functions.

In a thorough elimination treatment of apomorphine, pilocarpine, eserine, and often, in addition, croton oil; in stimulating the patient's tissue metabolism vigorously even at the expense of the primary shock by means of the quartz actinic light; in filling the patient's thirsty tissues with gallons of pure water, cracked ice, and milk nourishment as soon as the stage of assimilation has set in, and finally in kindly, human, common sense, man to man companionship when the patient needs it, we have one simple technic in the treatment of inebriates that I have found to be highly efficacious. This does not mean that hypodermic injections of apomorphine, pilocarpine, or eserine, the highly therapeutic value of the bath, the nutritional stimulation of the quartz actinic light, or the common sense companionship of the doctor at the bedside of the inebriate is a sure cure for alcoholism. Neither separately nor collectively is this the case. It does mean, however, that these are foundation stones and that these factors individually and collectively are highly valuable.

When these fundamental therapeutic agents are employed to meet the individual needs of the specific alcoholic case that challenges the members of our profession, any physician holds in his hands a most powerful lever to help the patient help himself in prying loose from this most damnable, despair begetting, and ruinous habit. Then, after all is said and done, the patient guilty of inebriety in the past, must stand upon his own feet and face the future with his new clear brained will. Unless he possesses fifty-one per cent. constructive will and sticks to the stop remedy he certainly is not equal to the task. Therein lies the tragedy of alcoholism among some patients. If they won't, they won't and that is all there is about it. The above technic, however, intelligently applied, will help the patient to construct that fifty-one per cent. will power which will throw the balancing scales toward the sure lasting stop cure. The patient can then go forth, and will in most cases go forth, feeling all the mental buoyancy and exhilaration of a free man with a newly built courage and a quiet resolve to keep his mind and his body free in the future from further alcoholic toxins. What more can a physician do? What more can anybody do in the effort to help people help themselves in this problem of treating the inebriate?

LYMPHOSARCOMA.

Report of a Case.

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Lieutenant, U. S. M. R. C.

CASE.—A. W., adult male, an indoor salesman of clothing, first came to me for medical advice April 23, 1916. Mother was in good health; father died, aged seventy years, of pneumonia; one sister died one year previous, aged thirty-five years, of cardionephritis, and two sisters and one brother were living and well, ages thirty-five, forty, and forty-three years, respectively. In childhood the patient was breast fed. He had one attack of measles as a child and as an adult his only illness was appendicitis two years previous. He denied gonorrhea and syphilis; he was married and his wife was healthy and had never had any abortions or miscarriages. They had three healthy children. The patient smoked and drank very little. April 18, 1916, he went to his family physician complaining of pain in the left thigh and left buttock. The family physician said the patient had rheumatism. The patient came to me April 23, 1916, complaining of pain in the left thigh and buttock, especially on walking uphill or upstairs. There was no pain while sitting or lying down and only slight pain while standing. There were no fever, chills, or shortness of breath, and absolutely no other symptoms. The pain was characterized as a dull ache, confined to the posterior aspect of the thigh and exaggerated by exercise of left lower limb.

Physical examination.—Male; adult; well built; muscular; five feet five inches tall; weight 155 pounds; apparently in perfect health. The hair was abundant, of good condition, and slightly gray. The face was full and of good color with no marks or scars. Eyes reacted normally. Neck was full with no visible signs or masses. On palpation the entire left chain of cervical glands, anterior and posterior, were palpable, varying from the size of a pea to the size of a five cent piece. Glands on the right side of the neck were not palpable. The teeth were fair and tonsils small and not inflamed. The chest was a good shape and expansion was normal. Vocal fremitus was normal throughout. Mass under the left pectoral muscle was not visible but palpable, the size of a walnut, hard, firm, and not painful or tender. The heart was normal. The patient said he had felt the glands in the neck for the past two or three days but thought nothing of them, and had never had them before. He also noted the same in the groin for the first time. On percussion of the chest three small areas of dullness were noted in mediastinum. Auscultation was normal throughout. Arms were normal. Abdomen was flaccid and protruded slightly. Liver, spleen, and kidneys were not palpable and there were no masses. A scar of an old appendectomy was present. On lying down the patient flexed the left thigh and leg slightly. On straightening the thigh the lumbar region arched slightly forward and the patient felt discomfort but no pain. Glands of the groin were slightly enlarged on both sides, varying from the size of a pea to that of a five cent piece. Thighs were normal and there was no tenderness anterior or posterior. Buttocks were not tender. Motion of limbs was not noticeably limited. Legs and feet were normal. Knee jerks, Babinsky, and Romberg reflexes were normal and the testicular reflex normal. Hearing, vision, taste, smell, touch, and sexual normal. The patient said that if it were not for the pain in leg he would say that he never felt better in his life. He insisted on a diagnosis. I told him I was not certain but believed he had Hodgkin's disease. Blood count was normal. Examination of urine, feces, and sputum was negative. Blood for Wassermann test was taken. No medication was prescribed. On April 28th I removed a posterior cervical gland the size of a hazel nut. It was slightly adherent and hard, firm, and not elastic. I placed it in formalin and took it to Doctor Rohdenberg for examination.

On April 30th the patient complained of severe pain in the left thigh and buttock. Glands were palpable on the right side of the neck and axilla, and there was enlargement of a gland on the left side. Codeine, acetphenetidol, and salicylates were prescribed, but relief was very slight. Doctor Rohdenberg reported primary lymphosarcoma. May 3d the patient was put on arsenates and advised to go to

the General Memorial Hospital under Doctor Coley's care. He was admitted to the General Memorial Hospital May 8, 1916, and the diagnosis was corroborated. X ray of the chest showed enlarged glands of mediastinum. The patient received increasing doses of Coley's erysipelas and prodeposus toxins every other day. May 24th. The patient became tired of the hospital and went home. May 26th. I gave the patient an injection of the toxin myself. May 27th. I was released from the case. A colleague was called in who ridiculed my diagnosis and called the case luetic and promised cure. Since May 26th my knowledge of the case is indirect. My last examination of the patient was on that day. He was much weaker, and all previous glands were much more enlarged, the gland under the left pectoral muscle being the size of a fist. The pain in the thigh was very great and the patient was unable to work. Loss of weight was about fifteen pounds. X ray treatment, seven exposures, was given. I next saw the patient June 12, 1916, and his condition was visibly the same. He would not permit me to make an examination, but told me he was on antisyphilitic treatment. In August I heard he had been to Dr. Harlow Brooks. I phoned Doctor Brooks, who said diagnosis of lymphosarcoma was correct. I later heard the patient was in Lebanon Hospital getting intravenous salvarsan in full doses weekly and that the enlargements were disappearing. I visited him the latter part of September and he appeared much improved mentally and physically. He believed he had syphilis and was going to be cured. He had but one enlarged gland under the pectoral muscle. This was later removed and the patient discharged. He returned home feeling well and went to work.

After six weeks he had a relapse. During this time he was getting full doses of salvarsan every ten days and intramuscular injections of mercury twice a week. I was called December 17, 1916, and found patient greatly jaundiced and very weak. He complained of dizziness, pain in left thigh and buttock, and headache. His appetite was good. Examination showed enlarged glands in the neck on both sides, varying in size up to size of walnut. Small gland was in right axilla and in the left axilla a large mass size of egg in the old scar where the gland had been removed several weeks previously. The abdomen was distended. A large, immovable mass was palpated in the upper epigastric region; it was not tender. The liver and spleen were not palpable. Reflexes were exaggerated. Left leg was moved only with great pain. Temperature, 98° F.; blood count, normal; blood pressure, 80 Hg.; urine bilious; feces gray and large fecal concretions. Arsenates and cocaine, acetphenetidin, and salicylates were prescribed. I saw the patient almost daily from this time. Jaundice was increasing and the abdomen becoming more distended. Pruritis was great and there was buzzing in the right ear. On examination, the ears were found normal. All the glands about the neck remained the same. The mass in the left axilla was increasing in size. In the latter part of December I advised cholecystostomy or cholecystenterostomy to relieve distress. Doctor Libman was called in consultation as to advisability of operating and advised against it. January 2d: Spleen was palpable; buzzing and pain in right ear; acuity of hearing greatly diminished. Mass in axilla size of grapefruit. The patient was losing ground rapidly. Temperature was normal. This state of affairs continued until February 13th. The patient became irrational and was very emaciated. Pulse, 108; temperature, normal. February 16th all glands of neck and axilla and groin disappeared. The mass in the left axilla was about size of an egg. Abdomen as previously; blood count, normal. February 17th. Mass in axilla disappeared; abdomen same; pulse, 120; temperature, 100° F. A bed sore over the sacrum became infected and was first noticed to be the size of a quarter. A nurse was brought in on the case. The patient was still irrational; he weighed about ninety pounds. February 20th. Temperature, normal; abscess of bed sore evacuated; pulse, 108; patient growing weaker and weaker. February 25th. Pyloric obstruction developed and the patient began vomiting every other morning large quantities of foul smelling gastric contents, in which there was no blood. Blood pressure, 60 Hg.; jaundice disappeared; the patient was irrational from now until the end. March 5th. Mass in axilla was again palpable and was the size of a pigeon's egg. The spleen was enlarged down to

the umbilicus. Blood count, normal; pulse, 120; temperature, normal; respiration, 28. Condition remained the same until the end. The patient was irrational but conscious, and died March 9th at 8 a. m. No autopsy.

ST. NEERLAND, ENGLAND

DEAD TEETH.*

By JOSEF NOVITZKY, D. D. S.,
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In May, 1915, I put before the Section in Surgery of the San Francisco County Medical Society the question (1): May a dead tooth be so treated that, if it be left in the body, it will not later become a source of local or systemic infection? Now, after a close study of hundreds of cases during a period of more than twenty years, I feel confident in answering in the negative to this question. In order that there may be no misunderstanding of the terms of the question, it is necessary first to define clearly what is meant by a dead tooth. There is a common belief that the human tooth has two sources of nourishment, the pulp and the pericemental membranes. This notion is wrong, for as soon as the pulp supply is interrupted tooth dentine dies. Loss of the dental pulp cuts the tooth bone or dentine off from the vital blood chain of the body. Blood or blood fluids can pass into the pulp chamber of the tooth only by way of the apical foramen. The cementum which is deposited on the tooth root from the cementoblasts of the tooth socket continues to hold the pericemental fibres in position against the tooth root after the pulp supply has been cut off. This prevents the tooth from being exfoliated as a sequester.

Cementum has no inherent genetic powers. It is merely a calcic cement substance, normally lacking lacunae and Haversian systems. By way of the openings for the pericemental fibres a protoplasmic fluid probably penetrates part way through the cementum. But this fluid would not be capable of preserving vitality in tooth dentine even if it could penetrate to the dentine. Histologically it is impossible for dentine to receive any nourishment through the cementum. This is proved clinically by the fact that the dentine of pulpless teeth is dry, foul, and more or less discolored. It has been proved to me by the fact that in all my experience I have failed to discover any pulpless tooth which has not shown deleterious changes in the dentine some years after the pulp supply was cut off. Hence any tooth whose pulp supply has been cut off is a dead tooth.

No matter how thoroughly or by whom a pulpless tooth has been embalmed or treated, it will become dry, opaque, solid in its socket, discolored, and offensively odorous. The various methods and medicaments employed to sterilize the dentine of a dead tooth serve merely to retard decomposition of the organic elements of the tooth. They do not prevent decomposition. The practical impossibility of embalming the dead organic matter of a tooth so that it may be retained in the mouth with no injurious effects to its surroundings will be quite ob-

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vicious to any student of bacteriology. Dead teeth, therefore, must be removed from the jaws completely, if patients are to have positive security from the ills resulting from suppurating teeth.

Root amputations must be abandoned. When dead teeth from which the roots have been amputated are removed from the jaws two years or more after the amputation, there will be found commonly a very tenacious membrane adhering to the end where the root has been amputated. When this membrane is torn loose from the root stump, a drop of greenish fluid, which has formed a blister like elevation, escapes. The root stumps are discolored. They present a clear macroscopic picture of dead tooth structure. Röntgen ray examinations of some teeth from which the roots had been amputated were practically negative. At times when these teeth were removed, bone which had formed in the operative wound after the amputation was very soft. Odors were more or less in evidence. In some cases there was found a pure strain of staphylococcus albus in the remains of the roots; a pure strain of streptococcus was found in the area below the roots. staphylococcus albus was introduced possibly at the time of the dental work on the root canal. It was not due to contamination in the securing of the smear.

It has been claimed that pathogenic streptococci can invariably be isolated from the root ends of normal vital teeth. This, I believe, is an error. During certain operations involving extensive exploration of the jaws, after the gums and periosteum had been retracted, I obtained by means of a small gouge negative cultures from the apical regions of normal vital teeth. The transplanting, the replanting, and the implanting of teeth must also be abandoned, if patients are to have positive security from the ills resulting from septic teeth.

Attempts have been made to preserve the "vital element" in a tooth that was to be planted. The tooth has been extracted and sewed into a cock's comb, there to be kept "vital" until it was needed. Then it has been prepared in a 98° F. normal saline solution. Great care has been taken to avoid injury to the so called vital cells in the cementum. I have boiled teeth from a half hour to an hour before implanting them. Now a boiled tooth is obviously a dead tooth, but it is not more dead than is the cock's comb tooth or any other extracted tooth treated with a view to preserving "vital cells" in the cementum. Such teeth ankylose as do boiled teeth. Irrespective of the technic used before plantation, the roots of planted teeth are absorbed. I have seen teeth transplanted by Dr. W. J. Younger roll into the mouth eight years after the transplantation; no roots were left; the crowns of the teeth were discolored and offensively odorous.

Some men maintain that dead osseous structures are not absorbed; that absorption of the roots of replanted teeth is evidence of vitality. They hold that a pulpless deciduous tooth root is not absorbed. Nevertheless, dead deciduous roots are absorbed in the absence of active suppuration. It is not lack of pulp but presence of suppuration which prevents absorption. In some cases of transplanted teeth röntgenograms show clearly that the crest of the

alveolar wall has been absorbed. In other cases röntgenograms do not indicate pathological destruction of the alveolar process surrounding transplanted teeth. Absence of pathology, however, has not been demonstrated either by exploratory operation or by bacteriological study.

If a dead tooth is to remain in the mouth, replanting offers the opportunity for boiling the tooth and rendering it temporarily sterile. The apical foramen of the tooth to be replanted may be sealed with a gold or amalgam filling. This may prevent the slow passage of toxins or even bacteria into the sponge bone and the bloodstream through the apical foramen of the dead tooth. One end of it, more or less walled off by eburnated bone, is in the cancellous bone of the jaw; the other end is in the mouth with an unlimited supply of bacteria. Even if no apparent infection or no putrefactive change takes place in the tooth, it must be a point of lowered resistance inviting possibly hematogenous infection.

My views of dead teeth have been criticized as radical, but such criticism has originated primarily in men who insist that a pulpless tooth is endowed with some vague form of life. They would even have us believe that pulpless teeth which have been long extracted still possess dormant vitality. The error of this belief has been repeatedly demonstrated. Certain leaders of the dental profession who advocate methods of embalming dead teeth and retaining them in the body exhibit röntgenograms which indicate clearly pathological destruction of the bone underlying the dead teeth.

Dead teeth, of course, may be valuable as organs of mastication, but the fact remains that amazing good results follow a thorough removal of dead teeth. Patients often gain from six to twelve pounds in weight within a few weeks following the operation, even before prosthetic appliances can be made ready to assist in mastication. We have seen that pulpless teeth are dead. They are subject to the laws of decomposition controlling dead organic matter. Decomposition in them may be retarded, but it can not be prevented. Root amputations and transplanting, replanting, and implanting fail as attempts to retain a dead tooth in the jaw with security against ill results.

The primary and secondary lesions resulting from the retention of dead teeth in the jaws are now well recognized. We should emphasize, however, two main points: 1. A microorganism, a poisonous protein, or a toxin introduced into the bloodstream by way of cancellous bone would be more active than would be the same amount of it introduced into the stomach. 2. If it is introduced into the bloodstream in small amounts over a long period it may break down the body resistance. On account of ills resulting from the retention of dead teeth in the jaws and on account of the impossibility of rendering dead teeth permanently aseptic, we must conclude that teeth should not be devitalized. In most cases in which exposed nerves were "killed" it would have been possible to retain the pulp alive by covering it with a zinc oxide creosote paste.

When teeth are dead they should be removed from the jaws. But they should not be "pulled" or

extracted. They should be dissected out, according to the following technic (2). Under local anesthesia the gums and the periosteum may be cut loose and retracted along the entire side of the jaw if this is necessary in order to gain space for operating. If the gums are carefully sutured back in normal position against the teeth, reattachment will take place. Ordinarily it is sufficient to cut a triangular flap with the apex pointing to the gingival margin of the tooth to be removed. This flap is raised and held back. The buccal or labial wall of bone over the entire root length of the involved tooth or enough to give direct access to the apical region is removed with the chisel. The removal of bone over the entire root length allows the roots to be used as a guide to apical pathology. Drainage points, no matter how minute they may be, are plainly seen. If bone is removed over only part of the root length, the tooth must be removed of course, before the apical curettement can be done. The tooth may be hooked out sideways either before or after the apical exploration and curettement, depending on whether or not the entire root length of the buccal plate has been removed. The external periosteum flap is pulled into the opening at completion of the operation with a suture. The removal of bone over the entire root length allows the falling in of the periosteal flap and rapid healing. Gauze packings are usually avoided.

Objections to this technic on the ground of bad cosmetic results are not based on actual results; for if the operation is properly conducted, bone reforms and fills in the operative wound. Objections on the ground of loss of masticating surface are trifling; a sanitary removable bridge or a skeleton plate may furnish all masticating surface necessary.

The advantages of the technic outlined above are as follows:

1. It avoids fractures which commonly result from attempts to "pull" ankylosed teeth. Dead teeth are usually partially ankylosed and very brittle.

2. It gives opportunity for complete curettement on account of the direct access to the affected parts.

3. It avoids the retention of septic bone and granulations which may result in systemic toxemias or bacteriemias. Infective thrombosis or embolism is particularly apt to follow the opening of facial veins.

4. It renders apparent any pathologic involvements of the nasal floor and any vents under the antral membrane or into the nasopalatine canals or into the dental canal of the mandible.

5. It avoids the low grade suppuration due to incomplete surgery, which causes extensive absorption of the alveolar process. The loss of bone on account of such absorption destroys the foundation necessary for an efficient plate.

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HEAD BUILDING.

Tuberculosis Following Exposure to Asphyxiating Gases.—Gimbert (*Paris médical*, January 5, 1918), among 312 cases of suspicious bronchitis examined in an ambulance hospital, found eight cases in which, after exposure to gas attacks, pulmonary tuberculosis became established or an old infection lighted up. Chlorine bearing gases seemed the most deleterious in this respect. Of the eight cases, five had had insufficient or no mask protection during the gas attack. In only two was there no familial or personal predisposition to tuberculosis. In three cases the lung symptoms began immediately after the exposure to gas, one developing an incessant cough, another hemoptysis still persisting after a month, and the third, incessant dyspnea. In three other cases, an intervening free period was noted, one developing extreme dyspnea after two weeks, another pleurisy after two months, and the third, laryngitis and bronchitis after four months. In the remaining two, marked symptoms appeared only after three and six months, respectively, though in the meantime some premonitory indications were noted. Three groups are recognized, according to the course of the disease: (1) Three cases with rapid progress and extensive lung lesions. One case in four months presented a bilateral lung infiltration with a large cavity at the right apex; another, in the same period, bilateral infiltration combined with pleural, lymphatic, and laryngeal disease; the third, in ten months, infiltration of both bases and congestion of both apices. The general health was markedly impaired, with anemia, pronounced emaciation, and complete anorexia. There was little or no rise in temperature, though the physical signs, and even more clearly the x ray findings, showed extensive involvement. (2) Two cases of tuberculosis in localized foci, likewise with marked impairment of general health but little or no fever. (3) Three cases of insidious, torpid tuberculosis, confirmed by the x rays. In some of the cases acid fast bacilli were found. The constancy of the signs in definite areas is held an important item of evidence in favor of the tuberculous nature of the lesions. In the treatment, besides immediate neutralization of the poison gas after the attack, a spray of sodium hyposulphite and sodium carbonate should be used three times a day, and two grams of the hyposulphite taken internally. The early and persistent hypotension and pulmonary vasodilatation should be promptly treated with digitalis—0.4 gram of the leaves in an infusion on the first day and thereafter 0.1 gram, or thirty drops of French digitalin solution on the first day and thereafter ten drops. Adrenalin should also be given by mouth—0.0015 to 0.002 gram on the first day and subsequently 0.001 gram a day for some time. Ipecac gives constant results as antispasmodic; emetine is far less certain. The subject should be carefully guarded against influences favoring lung infection. The least circulatory or respiratory disturbance, physical or functional, should be painstakingly treated; the nasal passages, mouth, and ears, carefully disinfected; rest imposed, and a generous diet allowed. No subject suspected of harboring infective bacilli should remain in the patient's vicinity.

Medicine and Surgery in the Army and Navy

TREATMENT OF WAR WOUNDS OF JOINTS AT ADVANCED MEDICAL UNITS.

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The following article is concocted from others written a year ago. There is no necessity to change the account of treatment given except in detail, because the recommendations have stood the test of time.

KNEE JOINT.

Wounds of the knee joint are more frequent and liable to be more disastrous in their consequences than those of any other joint. Their treatment, therefore, will be indicated, and the principles advocated can be adapted for other joints.

Nature of the injuries.—In the treatment of these cases there has been an enormous improvement since the early days of the war. This is owing chiefly to the early preinflammatory stage at which most operations are performed and the thoroughness with which they are carried out, and to a great extent also to careful fixation during transport. The evil effects of transport are manifest to a greater degree in wounds of the knee joint than in most other types of wounds. In many cases delay in operation means absolute disaster. The nature of the injuries and the infection, coupled with the unfavorable conditions under which the wound is received and the impossibility which may exist of giving adequate attention to such injuries in the early stages, still frequently give rise to such an exceedingly rapid inflammatory disintegration of the joint and breakdown of the patient's general resistance that amputation is the only means of saving the patient's life. Later, one must not be tempted, on account of the apparently quiescent and fairly painless condition of the joint in certain cases, to postpone radical operation too long. In consequence of the communication of the wound in the bone or joint with the exterior, symptoms due to increased tension in the part are absent, and therefore the ordinarily described type of osteomyelitis or arthritis is not usually found. Patients with such injuries usually have an obstinately high temperature, and if the cause of this and of the steady, but probably insidious, deterioration in the general condition is not attributable to some other cause, amputation must be done.

Types of injury.—Certain common types of injury may be summarized as 1, cases of effusion without lodgment of the projectile in the joint in which it is uncertain whether the synovial cavity has been traversed or the synovial membrane has been merely bruised; those in which the synovial cavity has been traversed by a clean rifle bullet without injury to the bones; and those in which the bullet has cleanly perforated one of the bones entering into the articulation. In connection with injuries of this class the common association of effusion into an intact knee joint with a fracture

of the shaft of the femur is to be borne in mind.

Cases included in class 1 are obviously subjects for expectant treatment. If suspicion as to infection arises the joint should be tapped and the effusion of blood or synovia examined bacteriologically. If organisms are found, a usually successful plan is at once to open the joint freely, wash out thoroughly with some warm nonirritating antiseptic, and to close the wound carefully again, leaving a drain for twenty-four hours.

2. Cases in which the projectile has lodged within the synovial cavity and those in which it has lodged in one of the articular ends. When a retained rifle bullet lies within the joint, if the superficial wound is small and not inflamed, it may be left for a few days, the joint being in the meantime immobilized, but the better plan is to take no risks and operate immediately. Free fragments of shells or bombs or distorted rifle bullets must be promptly removed. Bullets or shell fragments embedded in the articular ends of the long bones form a difficult problem. Clean rifle bullets so situated as not to interfere with the movements of the joint need not be interfered with at an early stage. They may do no harm and have frequently been left indefinitely. Fragments of shell come into a different category. Here infective material has practically always been carried in and the retained body must be removed by the shortest and safest route. This may be by the original wound, although sometimes the localizing skiagrams may indicate a much shorter route, but as the bed of the missile is certainly infected, no advantage except that of direct access is gained by a special incision. As the extraction is commonly a matter of considerable difficulty the incision for the removal of impacted bodies should be free. The bone surrounding the fragment must be removed. Although after such treatment many cases have been sutured completely with success, it is safer, especially if the patient cannot be retained for observation, to leave the wound completely open for a few days, treating it with pack, paraffin paste, or intermittent irrigation as seems most suitable. A gauze pack, too tightly inserted, will favor necrosis. A non-poisonous antiseptic paraffin paste dressing gives less trouble than Carrel's irrigation method and seems to give equally good results. These remarks apply to all wounds which are left open.

3. Cases in which the synovial cavity has been more or less widely opened without damage to the articular surfaces, and those where fissured fracture or slight comminution of the articular ends of the bones coexists. These require the primary measures which are detailed later on, and often make remarkably good recovery if operated on within twelve to twenty-four hours.

4. Cases in which serious comminution of one or more of the constituent bones has occurred.

The majority of cases in which gross comminution and soiling of either femur or tibia is present require amputation. Severe compound T shaped fractures of the lower end of the femur can rarely be saved, and primary amputation is frequently

advisable. Extensive comminution of the cancellous tissue of the head of the tibia or condyles of the femur may prove very dangerous owing to the severe constitutional symptoms which follow septic absorption from the injured spongy bone. The early treatment of favorable cases should include chiseling or gouging away infected bone, if possible, followed by paste, pack, or Carrel dressings.

Comminuted fractures of the patella form a special class. The loose fragments, sometimes amounting to the entire bone, should be removed. The hole thus made can safely be closed in early cases by suture of the synovial membrane and an attempt made to obtain a movable joint, but usually free drainage is necessary if infection has gained a hold. This recommendation does not refer to cases in which an ordinary transverse fracture of the patella has been produced by a sudden muscular contraction following a bullet wound of the thigh, even though the bullet should have traversed the knee joint. Neither should it be extended to clean fractures of the bone if produced by direct passage of the bullet.

Treatment at regimental aid posts and field ambulance dressing stations.—Severe injuries should be treated on the same lines as fracture of the femur, that is to say, they should be put up in a Thomas splint outfit. In small penetrating wounds the limb should be fixed in a long gutter splint, e. g., a long Jones's fracture splint or Gooch material, with a large popliteal pad, reaching from the tuber ischii to the ankle. The upper and lower end of the splint should be fixed to the skin by strips of adhesive plaster, of which the lower may encircle the limb, but the upper should, if applied at all, be applied spirally. The plaster prevents displacement of the splint. Dressings and bandages must not be applied so firmly that circulation of the limb or exudation from the wounds is interfered with. Movements of the joint may turn the scale in favor of extension of sepsis and may make all the difference to the patient's future.

The question of amputation at this stage arises only in cases where the limb is hanging on by lacerated remnants, the bones, vessels, and nerves being hopelessly destroyed. The skin should be painted with picric acid in spirit, visible foreign bodies and absolutely loose protruding pieces of bone and blood clot removed. No other interference with the wound is justifiable unless to stop hemorrhage. No drains should be inserted. If a large gaping or valvular wound exists, loose folds of gauze wrung out of weak antiseptic, preferably one per cent. iodoform in paraffin, should be inserted to prevent apposition of infected surfaces.

Treatment at casualty clearing stations.—The splendid results which can be achieved make it desirable that all cases requiring operation should be treated here within a few hours of admission, but during severe fighting this is out of the question, so that a selection must be made, during such times, of cases likely to be able to travel to the base without serious risk. This selection, so far as the injury of the joint alone is concerned, will depend chiefly on the size and position of the wounds, especially of entrance wounds; on the size and character of the missile, especially if lodgment

has occurred, and on whether it is visible or palpable; on the size of the wound in the synovial membrane and on whether it communicates freely with the surface wound so that infection will occur easily; on the amount and character of comminution of bone; on the presence or absence of injury to large vessels; on whether intrarticular tension is present or absent; and finally, on whether definite sepsis has developed or not.

Cases for transfer to base.—If the wound of entrance is small, especially if due to an undistorted rifle bullet; if there is no external evidence of a foreign body; if there is no comminution of bone or injury to large vessels; if there is not painful tension; and if there is no inflammation, the patient may be sent on to the base, after thorough disinfection of the skin, suitable dressing of the superficial wounds, and fixation of the limb, the knee being slightly flexed, in a splint of proper length. The Thomas splint outfit is the best for the purpose and those cases in which penetration of the synovial cavity is even merely suspected should be fixed in it. It may be noted here that an open wound of the back of the joint is usually less serious than a similar one on the anterior aspect, possibly because, in the latter, sepsis is more likely to gain access during transport.

Cases for retention at casualty clearing stations.—If the superficial wound is large, even, e. g., like that caused by a shrapnel ball, and especially if it communicates freely with the synovial cavity; if there is a visible or palpable foreign body which has opened the joint; if there is much comminution of bone; if there is a hematoma in the popliteal space or hemorrhage from a wound there; if there is undoubted inflammation, the patient should be kept at the casualty clearing station. On admission, the limb should be dressed, fixed in a suitable splint, and, if x ray localization is required, the patient should be sent to the radiologist, who should take two skiagrams, one anteroposterior, toes pointing straight forward, and one lateral on the same plate if possible. This method is probably the quickest and best in the circumstances. The patient is then sent to the preoperation ward. The splint should not be removed till the patient has been anesthetized. The strapping of the splint permits examination of the wound without moving the knee.

General remarks regarding operation.—In no other class of cases is technic and judgment in early treatment reflected so much in the results obtained. The surgeon who exhibits the greatest care in technic, especially when removing foreign bodies and infected tissue, whether of the soft parts or of bone, gets the best results. Conservative operations on gunshot wounds of the knee joint, however, in order to be successful, demand such care that they should be handed unreservedly to the surgeon in the unit who has demonstrated special skill in their performance. Most of the failures are attributable to want of appreciation of what is essential in totally excising the soiled wound in such cases.

Excision of wound.—The ultimate object of treatment of these cases is to secure mobility of the joint. The primary object in the casualty

clearing station must therefore be to secure asepsis. The surest and quickest way of doing this is to excise completely, if possible en masse, all tissue which is definitely or probably infected. This having been done, the wound remaining can be treated on aseptic principles. This, of course, entails the exclusion of all instruments, gloves, towels, etc., which may have come into contact with infected parts. A large percentage of these wounds are sutured, and heal by first intention. A suitable plastic operation may have to be done. In many cases it is advisable to provide drainage "down to but not into" the joint cavity or bone fragments for twenty-four hours. Although, in many cases, the wounds cannot be closed, yet it is usually possible to suture the synovial membrane of the front of the joint, especially if the suprapatellar pouch is loosened from its upper and anterior connections, and pulled down. This point is of very great importance.

Fixation.—Fixation of the joint is essential to success even in the simplest wounds. It is found that the best method of insuring this is to put up the limb, slightly flexed, in a Thomas splint outfit, just as in cases of fracture of the femur, with the exception that the extension strips are applied with the object merely of keeping the Thomas splint in position. No traction is necessary. If a back splint only is used, it must reach from the tuber ischii to the ankle. Shorter splints are worse than useless.

Removal of foreign bodies.—Removal of a foreign body, lodged within or near the joint and not visible or palpable from the surface, should never be attempted without x ray localization. Otherwise probably more harm than good will be done by interference. If x rays are not available, these cases should be transferred without delay to a unit which is provided with an installation. Of course, in any case, if the foreign body can be seen or felt, or if synovitis is already very marked, the sooner operation is done the better.

Amputation.—If the injury has implicated the main vessels so that the foot is already cold and dead, amputation should be done, just above the knee if the wound is likely to remain fairly clean, and through the knee if sepsis is present and the condyles undamaged. In the latter class of cases reamputation is frequently necessary, and, when the condyles are left, it can be done so as to provide the longest possible thigh stump. If, as sometimes happens, one or other popliteal nerve is shot away so extensively that it cannot be sutured later on, and if the bones are much soiled as well as comminuted, the probability is that primary amputation is the best course. If sepsis is well established in presence of much comminution, especially if there be gas gangrene, and the patient in low condition from hemorrhage or toxic absorption, amputation must be done. In considering the question of amputation, the following points are of great importance: the possibility of removing or neutralizing infective material successfully, the amount and kind of comminution, the concomitant injury to vessels or nerves, and the condition of the patient.

Resection.—If, in less severe cases, the opposing ends of the long bones are so comminuted that smooth articular surfaces are not available, it is probably best to do primary resection in the way described later. As little bone as possible should be removed at these primary operations—only such as is soiled and badly comminuted. At the same time freedom of drainage must be obtained. A patient will often bear removal of a shattered infected condyle when a book type resection would kill him. Better adjustment of the joint surfaces can be made at a later date.

Removal of patella.—As a general rule, if the patella alone has been shattered, as happens fairly frequently, the fragments should be removed. If possible the synovial cavity should be closed except in some cases for a small drainage opening, by suturing the lateral edges and aponeuroses, possibly after undercutting the synovial membrane on each side, or by loosening the suprapatellar pouch as already described. If this cannot be done a pack should be used. The same procedure should be carried out if concomitant injury to other bones is not extensive. It is wonderful how the infection tends to remain limited to the anterior part of the joint if the limb is thoroughly immobilized, plus a flat pad in the popliteal space.

Conservative treatment.—If large fragments have resulted from the injury, if the patient has been received early and is in good condition, and if one is fairly sure of getting away infective material, the case should be given a chance and treated on conservative lines. When conservative measures are decided upon, the following are the most important operative details:

1. Determination of the track which leads to the depth. The knee may have been bent when the patient was wounded, so that when the limb is straight the track is distorted. Excision of the track is best made when the knee is held in the same position as when injured.
2. Thorough disinfection of skin and track. The whole of the skin around the knee and for at least six inches above and below should be shaved and disinfected. For final disinfection use picric acid, three per cent. in spirit. The external wound and track are disinfected if not very large, by the actual cautery, or by rubbing thoroughly every part with ten per cent. iodine or picric in spirit. The strong solution has the effect of drying the tissues.
3. Careful and complete excision of external wound and track, including the edges of the wound in the synovial membrane, if possible in one piece. Incision, using a sharp scalpel, must be made quite clear of the deep as well as clear of the superficial wound. Pockets must not be cut into. Clipping infected tissue away piecemeal courts disaster. As the blades of the scissors are closed, infective material from their proximal parts is forced along to the distal. The least little particle of infected material left behind may prevent success.
4. Provision of ample access to foreign bodies or comminuted surfaces in the joint. Blind groping with the finger is to be avoided, because the foreign body or infective material is thus frequently pushed beyond each reach, and further struggles in attempts

at removal end in disaster. Incisions must be chosen, therefore, which give easiest access, and they must be free enough, even to the extent of dividing the ligamentum patellæ and turning up a flap, etc., to enable one to see the foreign body, and obtain plenty of room for manipulation of instruments. If complete excision of the infected wound has been made under proper technic one should be able to get first intention after suturing, however large the wounds may be. 5. Careful removal, under direct vision whenever feasible, of all foreign material, whether free in the joint or imbedded in the articular surfaces. If the latter, the bone surrounding the foreign body must be carefully chiseled or gouged away, *en masse*, if possible. The joint cavity is then flushed out with five per cent. saline, flavine solution, etc. Bone cavities may be treated with bipp or other paraffin paste.

6. Closure of the wound in layers, using fine catgut for the synovial membrane. Drainage tubing should not project into the joint. Of course, if tubes are required for the introduction of fluid, as in the Carrel-Dakin method, they should be carried to the deepest recesses of the joint, or inserted through a fresh incision. They should be removed as soon as possible. 7. If the wound in the synovial membrane cannot be closed, a small "salt pack" or gauze wrung out of iodoform paraffin, separate from any other which may be required for the rest of the wound, should be inserted firmly "down to but not into" the joint, and should be left until it is absolutely loose. A small tube may be placed in the centre of the pack, reaching to the synovial membrane, and it may be removed in a couple of days. If attempts are made to pull the pack away, adhesions shutting off the main cavity of the joint are likely to be broken down, and infection is then liable to occur. 8. Tendinous or ligamentous structures exposed during operation should be covered by skin and subcutaneous tissue, otherwise they are very apt to slough, and this postpones closure of the wound and therefore prolongs convalescence. 9. If there is much effusion into or from the joint, of whatever nature, or if raw surfaces, whether of bone or soft tissue, are left in the joint, at the end of operation, a tube should always be inserted "down to but not into" the synovial cavity. Pressure of effusion, i. e., tension, must be avoided at all costs, because it interferes with healthy circulation in and absorption by the synovial membrane, and these are essential to successful combating of any infection which may have been overlooked.

10. The injection of ether, formalin glycerin, or hypertonic, five per cent., saline solution into closed joints, is of doubtful value. They are all irritants. Success is claimed for all three, although their actions are different. The common factor in their application is preliminary aspiration of the joint. This removal of tension is possibly the explanation of their apparently beneficial action. The injection of or washing out by a nonpoisonous, nonirritating antiseptic like flavine, whose antiseptic action is enhanced by mixture of the substance with body fluids, may be of great value in many cases, and has been frequently used with no apparent detriment. The joint is completely closed thereafter.

11. In cases where drainage of the suprapatellar pouch is made, vertical suspension of the limb in the way recommended by Colonel Mayo Robson has been found of much value. The position makes the pouch the most dependent part of the joint, and on that account many are inclined to adopt the method as a routine in early cases which require drainage. 12. The paramount importance of obtaining x ray skiagrams has already been indicated.

Hemarthrosis with small external wound.—One other type of injury, that which produces hemarthrosis in presence of small through and through wounds and where only slight damage to soft tissues or bone is present, may be discussed. If the effusion cannot be aspirated, owing to the fact that firm clotting has occurred, best results will be obtained by deliberately opening the joint, by free incision on one or both sides, washing out the clot with sterile salt or flavine solution, and stitching up again without drainage. If the wounds are very small, one need do no more than sterilize them superficially, unless they come in the line of the fresh incisions, when they should be completely excised. Such a blood clot, after a few days, forms excellent pabulum for the growth of organisms, and, even though it does not become infected, it is often the cause of much distress and disability in later stages, owing to formation of intra-articular adhesions. Officers at base hospitals in France appreciate the disastrous results of insidious infection in such cases. Hospitals in England have beds occupied unnecessarily long even by noninfected cases, because, owing to the adhesions, they require skilled massage and so forth. Arthrotomy in this type must not be undertaken lightly. Technic must be perfect, else dreadful disaster is incurred.

Retention of cases after operation.—Operated cases should be retained for at least twenty-four to forty-eight hours. If the joint looks quiet and the general condition is good, many can be evacuated with safety at the end of that period, but in doubtful or the more serious cases evacuation should be postponed if possible till all danger from sepsis has passed. Firm compression under a very thick layer of cotton wool and fixation in the Thomas outfit should be employed in the early stages. The knee should be slightly flexed. A pad of wool in the popliteal space, tapering to each end, tends to prevent inflammation spreading from the back of the joint. While the ham splint of the outfit is best for transport and for cases in which the wounds are in front of the joint, yet if there is a large wound on the posterior aspect, the thigh and leg should be suspended on separate slings of perforated zinc, well padded and covered with jaconet, so that access to the wound is provided without running risk of moving the joint. Gentle passive movement, to a few degrees at first, should be begun as soon as one is certain that the parts are healing aseptically.

Sepsis.—If sepsis develops, all wounds should be opened up freely, possibly bilateral openings should be made, and the synovial cavity treated by intermittent flushing with Dakin's, flavine, or other suitable solution. If improvement does not occur within twenty-four to forty-eight hours, a transverse or

flap incision should be made, followed by resection as Colonel Fullerton has advised, or, after free division of the lateral and cruciate ligaments, by packing and fixing the joint in flexion in Hepburn's aluminium splint. If the articular surfaces of the bone have been injured, the former method is preferable. A salt pack or gauze impregnated with a paraffin paste may be used instead of Carrel-Dakin's dressings.

In conclusion, attention must again be directed to the importance of rigid technic, and the necessity for thorough and complete operation. Half measures are worse than useless. "All or nothing" is a sound watchword. If the fulfilment of these principles is not possible, far rather fix their limbs properly and send all patients on for treatment at the base.

SPECIAL REMARKS ABOUT OTHER JOINTS.

Primary resection.—The removal of shattered and soiled bone may be so extensive that a flail limb seems unavoidable, but the success of modern orthopedics is so great that amputation is unjustifiable merely on that account. On the other hand the provision of efficient drainage is essential to save life in many cases. If the main vessels and nerves of a limb are intact one must therefore remove on the one hand as much bone as will procure safety to the patient and on the other as little as possible to avoid a flail joint and at the same time provide efficient drainage. These problems are of least importance in the hip and shoulder and of most importance in the elbow and knee. One must remember further that the results of late excision, for ankylosis, are more favorable so far as useful joints are concerned than those of early excision. It is, however, unfair to compare the two because of the variability in severity of the original injury and the problems which have therefore to be faced. At casualty clearing stations the endeavor must always be to save life, limb, or function, in the order named, but the second or third must frequently be sacrificed in the attempt to save the first or second.

Shoulder joint.—If the articular surfaces are shattered, primary excision, with free drainage, preferably posterior, should be carried out. Amputation is not often necessary. If ankylosis is likely to result from the injury, the arm should be fixed in the abducted position.

Elbow joint.—Primary excision is advisable in all severe cases when the bones are shattered, but when movements of the hand are preserved. Those cases in which one or other of the bones remain intact are the most favorable. Incisions are planned according to the position of the wounds.

Wrist joint.—Excision of the shattered carpal or adjacent bones is frequently advisable. Very free drainage must be provided. Under recent treatment, amputation is rendered much less frequent. In all cases it is preferable to place the forearm and hand in a splint which holds the hand in dorsiflexion. If ankylosis at the wrist occurs in this position, the functions and power of the hand and fingers are better preserved than they are in any other.

Hip joint.—Free posterior drainage, with fixation

in a suitable abduction frame, is sufficient in most cases. Excision is occasionally and amputation only rarely advisable.

Ankle joint and tarsal joints.—If the injury is severe or if the infection is not likely to yield to free incision, resection, and drainage, amputation should be performed without hesitation. The safety assured by the removal of the infected limb and the art of the artificial limb maker adequately compensate for the loss of the foot.

RECLAIMING THE MAIMED IN WAR.*

By R. TAIT McKENZIE, M. D.,

Major, Royal Army Medical Corps.

In the spring of 1915 when I presented myself at the Surgeon General's Office in London, and when during the course of the preliminary examination, I mentioned that I had had some special training in physical therapy, the examining surgeon was not cordial, saying that if they listened to all the men who were specialists they would get nowhere at all. So I said: "Well, put me at something." At Aldershot I gained some insight into the work done by the Royal Army Medical Corps which impressed me as being of an exceedingly high order. Although you have heard that the work of the base hospital is to treat the men surgically, in my experience the aim of the average officer in command of the base hospital is to get his beds empty as quickly as he can to be ready for the tremendous number of men who may suddenly need urgent surgical attention.

At first the man leaving the base hospital was passed on to one of the Red Cross hospitals scattered throughout the country where he was treated by the local physician, nursed by the lady of the house and her friends, and rapidly and inevitably spoiled by attention, hero worship, and general indulgence. In order to stop this demoralization of fine men it was found necessary to establish not only hospitals, but great convalescent camps in which the men were kept under military discipline and received treatment directed to putting them into condition for the front or at least light duty. These camps had a capacity of from 4,000 to 5,000 men with a variety of conditions. First of all were the nerve cases, men suffering from "shell shock" which is a very elastic term, covering both mental and circulatory disturbances. Then we had the debilities following dysentery and occasionally typhoid. There were innumerable wounds of all parts of the body and of all degrees of severity.

If at the base hospital in France it is found that a man will require prolonged treatment he crosses the Channel and goes into a great base hospital somewhere in England. From there he goes to a convalescent hospital and then to a command depot or physical training camp where he is put into condition to rejoin his battalion and return to the front. If he is never likely to be put in condition for active service he is kept under military control and note is taken of his profession or trade with the idea of returning him to civil life as a selfsup-

*Address before the College of Physicians of Philadelphia, February 6, 1918.

porting man. In Canada, under the Military Hospitals Commission he may be sent directly to his home or sent for vocational training. If further treatment is required it is given in a special hospital. In the command depot at Heaton Park the officers were practically all men who had been wounded or men over age. One of these officers had a fragment of shrapnell in the heart. He was our star patient and was x rayed repeatedly for demonstration. One officer had part of the hand off; another lost an eye. We had a staff of masseurs and medical officers and in addition, four civil practitioners to care for the casual sick. Four men blinded in action did splendid work as masseurs.

We had to improvise many of the means for carrying out our treatment at first. The picture shows one of the huts which we turned into a hydrotherapeutic ward. It contained a pool bath filled with water at a temperature of 94° F. Patients suffering with irritable heart, respiratory disorders, and mental disturbance the result of shell shock were greatly benefited by these baths. Progressive gymnastic exercises also form a part of the treatment for these heart conditions. The whirlpool bath was introduced by the French. The water enters at three places, runs around the side, and produces a whirlpool action at high speed and is kept at a temperature of 112° to 115° F. It was used in the treatment of painful scars and painful nerve conditions. It was a frequent and very distressing occurrence to see men coming in, wounded in the shoulder, with the arm blue, cold, and very painful. Massage alone was quite impossible. With the limb in the arm bath for about twenty minutes the blueness disappeared and the greatest possible relief was gained. Men who had not been able to sleep were made comfortable, and massage and other treatment made possible.

In the early part of the war there were many injuries from the hand grenades which were often caught by the men in the endeavor to return them before they exploded. We used the faradic current for muscle testing and muscle development. The galvanic current and ionic medication were also employed. In cases where a piece of shell has taken away part of the muscular tissue of the arm or thigh, ionic medication with saline solution and radiant heat were frequently used. The small hinged shoulder bath was of value in preparing the region for massage. Massage is twice as effective if the part is well prepared by hot water, radiant heat, or electricity. Some badly contracted scars are treated by radiant heat rather than by the whirlpool bath where they show a tendency to become sodden and break down. If, however, radiant heat and massage are persistently applied about the region of the scar it can almost always be slowly and progressively loosened and softened. Ionic medication is also used for softening the scar. In a large number of stiffened joints we found it very useful to have some means of recording the amount of movement gained.

Because of the great number of wounds affecting the hand and arm there is more necessity of devising appliances for developing the various movements of this member than for any other part of the body.

In devising these appliances we made it a rule to keep all stretching movements under the control of the patient as much as possible. If this control is not held by the patient there is danger of continually stretching or tearing an adhesion which makes the latter end of the condition worse than the first. A stretching movement has been worked out in this appliance for circumducting the ankle. This also is under the control of the patient. For the more skillful movements we used the pulley and weight a good deal. The exercises were arranged in a series, including stretching, and voluntary movements and were done in a definite order. The men came in classes of ten or twelve at a time. They were then given gymnastic exercises in classes of thirty to fifty. The pictures illustrate the organization which was necessary in the carrying out of this varied treatment. Provision was also made for deep breathing exercises, applicable mostly to the gassed cases, and for balancing exercises to steady the nerves in the shock cases and restore the sense of equilibrium and courage. On alternate days the men are sent off on a two mile march. We got them up to a six mile march which we considered sufficient to return them to their reserve regiment.

In a case of ankylosis of the elbow with atrophy, the result of splinting too long, passive and then active motion produced a good recovery. In a case in which the bullet entered and shattered the scapula causing a jagged wound, the patient, although a powerful man, was unable to carry his pack and was unfit for active service. In another case a high explosive shell lacerated the whole of the man's back, destroying some of the spinous processes. We used radiant heat and massage and the man is now in good condition. In the case of a man who was buried in the trench by timbers, producing paralysis of the abdominal muscles, faradic stimulation of the paralyzed muscles with muscular exercises brought about a good recovery. Another case showed one of the few instances we had of malingering. This man's hand was badly swollen every morning and a little investigation showed a bright red mark on the upper arm where he had tied a cord around his arm during the night and let the arm hang out of the bed. Had this occurred at the front the individual would have been shot, but we put him on the camp police force.

Metal facial masks are now being made to cover the deformities and enable the men to go about without attracting attention. Many of the men so disfigured become morbid because of the horror which they seem to incite and some in their depression have even committed suicide. Plastic surgery has done much for these men. In cases, however, in which the nose is completely destroyed a cast is made of the face, a new nose is modeled in clay, and from a cast of this an artificial nose made of copper, silver plated, and tinted to blend with the skin. It is usually held in place by a pair of glasses or by spirit gum. By such means the man is enabled to return to his work. In the loss of the arm many successful devices, or "salary hooks" as they are called, have been made. Artificial legs are also supplied and trades taught so that many men coming to the hos-

pitals are sent back with a vocational training which they before lacked, and thus a wound may be really a blessing in disguise.

We returned to the front line about forty per cent. of the men, about seventeen per cent. to the lines of communication, and about fifteen per cent. to clerical work at home; so that, for military purposes, we returned, perhaps, seventy per cent. The percentage sent back, however, depends largely upon the need of men at the front. In England now, where there is a call for 500,000 men, every man who can carry a gun will undoubtedly be sent back. Here, where there is and will be an abundance of men, I think the percentage sent back will be very small. It must be, therefore, always a question of supply and demand. In the convalescent hospitals and camps there will be a vocational officer whose duty it will be to ascertain a man's qualifications and preferences in reeducation that these may be adapted to his ability and desire. Usually these hospitals are established near a university or other institution of learning. For example, in Montreal they are located in close proximity to McGill University. In farming countries the men take up such occupations as chicken and truck farming, bee keeping, etc. I believe that only about seven per cent. of the men need to learn a new trade. There is always the tendency among men to choose an occupation that will keep them in the city. The great endeavor of the Government has been to prevent this. Nearly all the men without a trade want to become operators in a moving picture show. They are so accustomed to life in the crowd that they are unhappy if they are alone.

MEDICAL NOTES FROM THE FRONT.

Treatment of Compound Fractures of the Long Bones from Projectiles.

GENEVA, January 15, 1918.

The very nature of compound fractures of the pipe bones from projectiles depends upon the type of projectile and its velocity, as well as the direction of its axis of rotation. The bullet of a rifle or mitrailleuse causes the bone to splinter when it is animated by a medium velocity, but when the velocity is less it causes a fracture without displacement, resulting in a simple fissure of the bone. When the velocity is very great the bone is blown into atoms. Shrapnel bullets come usually animated with a relatively low velocity and only exceptionally produce a comminuted fracture; the missile becomes deformed when it strikes the bone and produces a compound fracture. When it hits the bone at its epiphyses it passes through this spongy tissue or it often divides in two pieces and produces a fracture without displacement of the fragments. Now, if the axis of rotation becomes deviated, the projectile causes extensive destruction. The muscles are torn in shreds, the bone is pulverized and the fragments are scattered through the lacerated muscles. The entrance and exit openings are enormous, while sometimes the missile itself bursts into small fragments which become embedded in the tissues composing the traumatic focus. The effects of bursting shells vary according to the mass and velocity of

the missile. When of sufficient size it may amputate a limb or produce crushing if the shell explodes near its victim. Of lesser size, it produces fearful wounds resulting in enormous loss of tissue. The bursting of hand grenades or aerial torpedoes rarely gives rise to comminuted or compound fractures. When these projectiles explode sufficiently near the victim they produce so many wounds that death results.

It has become more and more evident that the only proper way to deal with fractures of the pipe bones is by operation. In a general way, the incision is made in such a way that one of the openings of the missile is at its centre. It should be made very long at the start, in proportion to the extent of the fracture and should extend down to the fracture, care, of course, being taken in dangerous anatomical regions to avoid the large vessels and nerves. When the focus of fracture has been freely exposed the next step is to cleanse it. All detached fragments of bone must be carefully removed; some surgeons prefer to remove even those still adherent, but great care is taken to preserve every particle of periosteum that can be saved. Both methods have given excellent results. All strips of sloughing muscle and necrosed tendons must be removed with scissors and all pieces of clothing, leather, projectile, etc., must be carefully sought for and removed. If this work is carefully done, and it takes some time and must not be hurried through, the wound is transformed into an aseptic one, the fracture unites rapidly and healing of the focus goes on uninterruptedly. I would guard your readers against the detestable practice of pushing drains into the entrance and exit openings, because disaster is bound to follow.

I need hardly refer to the splinting of fractures of the long bones in warfare as the subject is too vast for a letter. I will only say that the Thomas splint is much employed by the English, while the French use Debet's traction splints with considerable success, and of course many other types too many to enumerate. I have only roughly outlined the treatment of fractures of pipe bones, but the point I wish to impress is that the operative treatment is the only one which will give successful results.

CHARLES GREENE CUMSTON.

MEDICAL NEWS FROM WASHINGTON.

Expanded Medical Instruction at Fort Oglethorpe.—Inspection of Surgical Services at the Base Hospitals.—Fatigue a Factor in Susceptibility to Disease.—Increased Sanitary Precautions for the Camps in Virginia.

In furtherance of the policy of expanding the training establishment of the medical department of the army at Fort Oglethorpe, Ga., and widening its scope, Brigadier General Henry P. Birmingham, medical corps, national army, has been designated as commandant of the camp, being relieved from duty at Washington in the Surgeon General's Office for the purpose. General Birmingham, who reached the retiring age of sixty-four years on March 15th, was placed on the retired list as a colonel, that being his rank in the regular army, but he continues to hold his position in the national army.

The plans being worked out for the medical establishment at Fort Oglethorpe contemplate the ulti-

mate concentration at that place of so much of the medical and allied educational system of the army as may be conducted at a training camp, so as to provide instruction for other classes of the personnel of that department besides the medical officers, including the dentists, and members of the sanitary and veterinary corps. Among the new schools that have been established at the camp is one for the physical diagnosis of lung diseases, with Captains William N. Anderson, Henry C. Drew, and James W. Price, medical reserve corps, as instructors.

The first class of dentists, made up of fifty members of the regular dental corps and thirty-five of the reserve corps, commenced a two months' course of instruction at the camp on March 15th. Lieutenant Colonel John H. Snapp, dental corps, who was designated as senior dental instructor some time ago, has as his assistants Majors Ben H. Sherrard and E. Henry Valentine, dental corps, and Major John D. Eby, dental reserve corps.

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In connection with the investigations being conducted, in behalf of the Surgeon General of the Army, of the medical services at base hospitals, as previously noted in these columns, similar inspections also are being made of the surgical services of those hospitals.

Among the officers engaged in these surgical inspections are Major John W. Barksdale, medical reserve corps, who is visiting Camp Funston, Kansas, Camp Pike, Arkansas, and Camps MacArthur and Bowie, Texas; Major Jonathan M. Wainwright, Camps Jackson, Sevier, and Wadsworth, South Carolina, and Camp Gordon, Georgia; Major Horace J. Whitacre, medical reserve corps, Camp Grant, Illinois, Camp Dodge, Iowa, and Camp Funston, Kansas; Major Junius H. McHenry, medical reserve corps, Camp Gordon, Georgia, Camp McClellan, Alabama, and Camp Pike, Arkansas; Major Homer Gage, medical reserve corps, Camp Dix, New Jersey, Camp Meade, Maryland, and Camp Lee, Virginia; Major John H. Blackburn, medical reserve corps, Camp Beauregard, Louisiana, Camp Pike, Arkansas, and Camps Bowie and MacArthur, Texas; Major Harry M. Hosmer, medical reserve corps, Camp Lee, Virginia, Camp Jackson, South Carolina, and Camp Gordon and Fort Oglethorpe, Georgia; Major William W. Babcock, medical reserve corps, Camp Wheeler and Fort Oglethorpe, Georgia, and Camps Sheridan and McClellan, Alabama; Major Walter W. Crawford, medical reserve corps, Camps Sheridan and McClellan, Alabama, and Camps Wheeler and Gordon, Georgia; Major Alfred E. Halstead, medical reserve corps, Camp Sheridan, Alabama, Camp Sevier, South Carolina, and Camps Wheeler and Gordon, Georgia; and Major John T. Burrus, medical reserve corps, Camp Pike, Arkansas, Fort Oglethorpe, Georgia, and Camps McClellan and Sheridan, Alabama.

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Fatigue as an important contributing factor in increasing susceptibility to communicable disease has been given serious consideration by the medical department of the navy. It has been demonstrated, particularly in cases under treatment on board the fleet hospital ship, that bodily fatigue plays an im-

portant role, potentially, in the outbreak of communicable disease when the source of infection is present. Indeed, in the training of recruits it may be the most prominent factor in determining the number of men who will become ill following exposure if immediate steps are not taken after detection of disease to stop physical exertion. A study of the effects of fatigue on the spread of such diseases as spinal meningitis has shown that men were more susceptible to disease after periods of exertion. For this reason, it has been pointed out that drills should stop at the point where the men will look forward to subsequent drills with pleasure rather than to regard them as laborious tasks, and that after a short rest and shower the men should emerge clear of eye and physically alert.

In this connection, Medical Inspector J. A. Murphy, of the navy, who has given so much attention to physical exercise in the service and was instrumental in introducing a modified Swedish system at the Naval Academy some years ago, is quoted as saying: "Strenuous effort should be approached slowly, as the exercises are not used to test the limit of power. Prolonged effort is to be avoided, in order that a condition of stimulation will occur rather than exhaustion. Exercise should produce the simple symptoms of physical activity, such as a general sense of warmth and well being, sparkling eyes, cheerfulness, and mental exhilaration, instead of those of overactivity, such as a vague sensation of discomfort about the heart, with constricting girdle sense, obscuration of vision, confused ideas, blunted sensation, and air hunger."

* * * * *

In its war duties of attending to sanitation in the extra-cantonment zones, the Public Health Service has given particular attention to the portion of Virginia between the York and the James rivers, that district being of special importance, as in it will be gathered for both training and embarkation the pick of all branches of the army and navy.

Langley Field, the aviation establishment at Morrison, and Fort Monroe with the coast artillery school are in this district. Two large embarkation camps—Camp Stuart and Camp Hill—will contain a military population already trained, whose health is of vital importance. In addition, the Newport News Shipbuilding and Dry Dock Company employs over 100,000 workmen engaged largely on Government work. The two counties, which cover about 100 square miles, normally have a population of about 55,000. This is now about 100,000 in addition to the troops. Newport News, for example, has increased 50 per cent. in six months.

The local health administration was entirely inadequate for the strain of the intensive military activity, which was to crowd the district first with workmen and then with troops, but the authorities willingly delegated their powers to service officers and cooperated with them. This work will cause a decided decrease in physical disability among the troops, especially with malaria and venereal diseases. Among the civil population it is expected to act as a protection against infectious diseases brought in by troops, who are gathered, especially at the military port of embarkation, from all parts of the country.

Editorial Notes and Comments

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NEW YORK, SATURDAY, MARCH 23, 1918.

PHYSICAL CLASSIFICATION OF RECRUITS.

We are pleased to see that the revised regulations for the physical examination of registrants under the draft provide for changes which are somewhat in the direction of the suggestions offered editorially by THE NEW YORK MEDICAL JOURNAL some months ago. The boards making the physical examinations under the original draft either accepted a recruit or rejected him unconditionally, and accepted only such recruits as were physically competent to perform the most arduous tasks assigned to the troops. Under these regulations, therefore, all those would be rejected who suffered from minor ailments which might easily be cured, as well as those whose condition prohibited their undertaking the more arduous tasks of the front line troops, but who, nevertheless, were fully competent to undertake special duties involving less strenuous physical exertion. Under the regulations recently issued, however, the local medical examining board must reject unconditionally all those whom they deem physically unfit for any kind

of military duty, and the cause of whose unfitness is not amenable to treatment. They accept all those who are physically fit beyond question. Such as are on debatable ground or whose cause of unfitness is amenable to treatment are referred to a medical advisory board. This board thereupon makes an examination, and must either (a) accept the registrant as physically qualified for military service; or (b) accept the registrant as physically qualified when cured of a remediable defect (which must be named); or (c) accept the registrant as physically qualified for special or limited military service in a named occupation or capacity; or (d) reject the registrant. When the medical advisory board accepts a registrant "when cured of a remediable defect" and the proper returns have been made in the prescribed manner, such registrant shall be inducted into the military service, after his number is reached; at such time as may be designated by the Surgeon General of the Army he must be sent to cantonment base hospital, reconstruction camp, or civic general hospital, as may be determined. If the board finds the registrant qualified for special or limited service it is required to designate the occupation or class of service for which such persons are qualified. The medical advisory board shall find the registrant not physically qualified only when he falls within the standards of prescribed unconditional rejections. The manual of instructions for conducting all examinations of registrants prescribes minutely the methods and the tests to be applied in all cases of suspected defects.

The new method of physical classification will render available a large number of men who were rejected entirely under the former system. Exactly what this proportion is has not been stated, but it is certainly large, and we congratulate the Surgeon General's Office upon the wisdom of this step.

RED CROSS BIBLIOGRAPHY ON REHABILITATION.

Organization of effort indicates increased individual interest in the stupendous task of rehabilitation imposed by the war. It is a sign also that such interest is shaping itself into effective grouping for applying resources where they will best meet urgent needs. The first of the publications of the Red Cross Institute for Crippled and Disabled Men, which is a bibliography of literature relating to the war cripple, compiled by Douglas C. McMurtrie, deserves and will re-

ceive the careful attention of all those who wish to become actively interested in work to be done. This extensive list, which comprises as completely as possible references to the literature published since the war began in August, 1914, is found in French, German, Italian, and English, the latter from America chiefly, and from England, Canada and Australia. It is not designed to cover the important fields of mental and nervous disabilities, nor blindness and deafness, nor special medical and surgical methods, for this is but the first of a series of scientific publications to be sent out by the Red Cross Institute, and it is to be expected that these subjects will be presented bibliographically at some future time. It is definitely promised here that new material will be added to the present list as it is received. Practically all the literature listed here is accessible for consultation in the library of the Red Cross Institute for Crippled and Disabled Men at 311 Fourth Avenue, New York City, the collection in the private library of the compiler having been placed there.

The references given are suggestive, significant, first of all, of the practical and businesslike way in which the matter of rehabilitation and employment of the cripple is considered in this era of efficiency and widespread opportunity in industry and constructive work. There is grim irony too about such a systematized and extensive approach to this great problem of patching up again and reconstructing where man has first taken the pains to destroy and mutilate and break down. Yet just here is another of those occasions for the pitableness of human doing and undoing to redeem and uplift itself, which sort of thing has always marked the course of evolution.

There is real opportunity for a more determined adaptation to the many possibilities which present themselves or can be created from the resources of nature and economic needs. There should be a keener attitude toward mutual help in such adaptation, a more constructive care—not a fostering one—toward the weak and disabled, which earnestly and determinedly seeks to find latent or still preserved ability and turn it to the best account. How varied an account this may be, a freshly invigorated interest in all the realities of life, born of the war spirit, is already testifying. It manifests itself in these many pages of reference showing the variety of occupations and interests of which warring nations of Europe have already been making practical test. It is shown also in the character of the articles, if judged from the names affixed to

them and the number of different publications in which they appear. Evidently the problems are exercising many men, whether medical, technical, industrial, or popular writers, and all are intent on bringing help to the injured, help which will give them not only a place as honored wards, yet with a feeble tenure upon society as time passes, but rather one which will give them back their individual right as competitors in the business of society. There is even hope that they will be made more competent and latent skill be better applied than had they been left to drift into the chance occupations of the easy times of peace. This ought also to arouse society to a new consideration of the possibilities for the too long neglected cripples who are always with us, and thus react through awakened interest and created possibilities upon the vast multitude in the social body who should be intelligently and effectively set to work.

A mere review of the references appearing in this bibliography starts the mind upon such possibilities and opportunities and gives inclination to every one to consult the writings themselves, in order to follow intelligently and take a part in the important movement.

III. HYPERTROPHIC PSEUDONEOPLASTIC TUBERCULOSIS OF THE TENDON SHEATHS AND ARTICULAR SYNOVIA.

A number of types of hypertrophic pseudoneoplastic tuberculous processes are being studied at present, such as massive tuberculosis of the cecum which clinically simulates a true neoplasm and which microscopical examination alone will differentiate. The hyperplastic forms of tuberculous adenitis are another example and, recently, Tedenat has encountered several instances of hypertrophic tuberculosis of the testicle or ovary, which simulated a neoplasm so closely that a mistaken diagnosis might very well be made.

This hyperplastic form of tuberculous inflammation may be met with in nearly all the viscera, but is particularly frequent in the synovial membrane of the joints, where it assumes very different aspects, occasionally offering the clinical type of hyperplastic proliferating fibrous or tuberculous synovitis of Koenig. In this case one or several tumors will be detected in the articular synovial membrane, of hard consistency, quite similar to that of fibromata of the breast. These tumors are mobile with the synovia itself, the latter being rather thickened.

Microscopically, it is evident the grayish mass of fibrous aspect is due to typical tubercles undergoing degeneration. In a case recorded by Potherat, the tumor was intimately united to the thickened synovia and offered a uniformly hard and homogeneous consistency. After removal the mass was found to contain in its centre a very extensive focus of caseous degeneration, which was surrounded by inflammatory tissue in which numerous giant cells were seen.

A tumor in the knee, having the shape of a large testicle, has been recorded by Conteaud. Its consistency was that of a lipofibroma. It was attached to the synovia by a long pedicle. On section it presented in its centre a caseous focus the size of a plum stone and microscopically many typical giant cells were seen. Conteaud believes that this arborescent lipoma of the knee joint was the ultimate outcome of a production of fatty tissue following a chronic tuberculous inflammation of the synovial villi.

Arborescent lipomata not being identical with fungotuberculous synovitis, may be considered, however, as a fatty transformation of the process. It is a change in the synovia such as inflammation can produce. The simple fact of the presence of considerable fatty tissue in what is called arborescent lipomata of the tendon sheaths in no manner authorizes them to be included in the class of lipomata. Tuberculous synovitis of the joints in which there is a predominating element of fat is well known, but one would never mistake these synovitis for a neoplasm.

Stiédra considers arborescent lipoma of the knee a chronic inflammatory process of the synovial villi, with production of fatty tissue, but this is again a hypertrophic, vegetating synovitis, in every way similar to the identical lesion which has been described in other synovia, that of the tendons in particular. The vegetating proliferation does not indicate a reaction of the synovial to infection, either tuberculous or otherwise. The virulence is only attenuated and the reaction takes place in the fibrous and lipomatous form. In a certain number of cases, Kouzine has mentioned the existence of tubercles in various stages of development, and out of a total of twelve cases of articular lipomata, in five tuberculosis was evident, four times it was in the neighborhood of the joint, and in three it appeared at a late date in the articulation.

Dittrich and Tichoff have also recorded several instances of arborescent lipomata of the synovial of the tendons distinctly tuberculous in nature so that the tuberculous origin of this type of lipoma can no longer be questioned.

CONDENSED EXERCISE.

It has always been a problem for the man who leads the intellectual life to secure what seems to be ample muscular exercise in a minimum of time. Seneca, in his illuminating *Epistle on Brawn and Brains*, says: "There are short and simple exercises which tire the body rapidly, and so save our time, and time is something of which we ought to keep strict account. These exercises are running, brandishing weights, and jumping, high jumping or broad jumping, or the kind I may call 'the Priest's dance,' or, in slighting terms, 'the clothes cleaner's jump.' Select any one of these, and you will find it plain and easy." Thomas Jefferson, unlike most present day college students, extended his time for study by condensing his exercise to a daily rapid run to a certain stone, a mile from the college, and return. Benjamin Franklin studied the question and came to the conclusion that the quantity of exercise is "to be judged not by the time spent or distance covered but by the degree of warmth it produces in the body . . . there is more exercise in one mile's riding on horseback than five in a coach; and more in one mile's walking than in five on horseback; to which I may add that there is more in walking one mile up and down stairs than in five on a level floor. The two latter exercises may be had within doors when the weather discourages going abroad; and the last may be had when one is pushed for time."

Many contrivances for concentrating muscular effort have been devised, from dumbbells of various size and pulley weights to yokes for lifting as much as possible from the shoulders. Fortunately the more strenuous of them have gone to the scrap heap, and all, after a brief and enthusiastic trial, find their way to the attic, even our own attic. Still the question of the amount and kind of muscular exercise needed by the adult has received no definite answer. So far as the muscles themselves are concerned, certainly they are well off with a very small amount of the most ordinary use. In sitting and walking and in our usual use of the arms, all the muscles of the body are exercised, and doubtless enough for health if—and it is a large if—if the amount of food consumed is not too great. For what, physiologically, does repeated or severe use of muscles effect but a burning up of so much more fuel? Of course, movements of the trunk aid digestion by mechanical effects, but are any unusual or violent trunk bendings or stretchings needed to aid the digestion of a proper amount of food?

Again, is it needful for health of the adult that daily muscular exercise should be so vigorous as to cause the heart to beat violently or to evoke deep respirations? Possibly this may be necessary to

keep the machine in condition for meeting emergencies, but certainly a little of such exercise will suffice, and the mere repetition to the point of fatigue is unnecessary and wasteful of resources that might be used to better purpose in mental work. It is much more needful that in enforced sedentariness the appetite should be curbed, or, easier, the number and complexity of dishes limited, than that much condensed exercise should be indulged in.

Whether the exercise be concentrated or dilute, it is essential for best results to the exerciser that it be mind absorbing, as in the playing of a favorite game or a brisk walk or ride with some object in view or with cheerful company by the way. Condensed exercise seldom has this last essential, the only persistent interest being in greater and greater condensation until perhaps the exerciser comes to grief from the violence of his exertions. The prescription of exercise for a patient is not easy, especially if he cannot, or insists that he cannot, take needed time for normal recreation out of doors. It should always be kept in mind, however, that the exercises which give the most pleasure are, through subtle influences, by far the most healthful. They are not likely to be of the condensed kind. For those who are overfeeding, exercise is not likely to counteract the food excess unless it becomes an all day business. Lastly it should be kept in mind that many people need bodily rest instead of exercise and we can now add to Franklin's gradations by saying that, for such, five miles in a motor car may be better than "one in a coach."

THE PATRIOTISM OF THE HOSPITALS.

The New York State Council of National Defense has studied the question of the proportion of attending physicians and surgeons and of interns attached to various hospitals in the State who have received commissions in the army or the navy, and the results indicate that a high spirit of patriotism rules in these institutions. As a whole, 22.5 per cent. of the attending physicians and surgeons, and 62.8 per cent. of the interns attached to the hospitals of the State of New York have received commissions. In eighteen of these hospitals fifty per cent. of the staff have joined the service, while only twenty-two hospitals have contributed no staff members to army work. Already there are some complaints regarding the deficiency on the part of thirty-five hospitals, while sixty-three have found it necessary to make new appointments on the staff to fill the vacancies caused by entrance into military service. In comparing these results with those observed in a census taken by Doctor Goldwater of the entire United States it was found that while twenty-four per cent. of the attending physicians and surgeons of the United States at large have received commissions, only 22.5 per cent. of this class in New York State have joined the service. On the other hand, New York has contributed 39.5 per cent. of its interns as

against twenty-eight per cent. contributed by the United States as a whole. While it is possible to draw still further for medical officers from this source, in some cases such drafts must be made with great care, otherwise the institutions will be crippled in their efforts to care for the civilian population.

Obituary

DR. WILLIAM LEE HOWARD,
Westboro.

Not only the medical, but the editorial world was sorry when the news came that William Lee Howard was dead. Only a fortnight ago the New York Medical Journal, with whose staff he was intimately connected, received a paper from him. His death took place in Boston on March 11th.

He was born at Hartford, Conn., in 1860, the son of Mark and Angeline Lee Howard, and had his early education under tutors in England and France and, later, at Oxford University, from which place he went to study medicine at the College of Physicians and Surgeons, Columbia, eventually taking his M. D. at the University of Vermont in 1890. He wisely supplemented this with courses of study in Bonn, Göttingen, Paris, and Edinburgh and, perhaps more wisely still, learnt much of the outside world by a whaling voyage of two years, gaining a master's certificate. In 1890-96 he practised medicine in Baltimore, making a specialty of nervous diseases, from whence, after a nervous breakdown, he settled in Westboro and devoted himself to literary work. Besides contributing articles to medical and other journals, he wrote several volumes, including: *The Perverts*, *Lila Sari*, *Red Flesh*, *Plain Facts on Sex Hygiene*, *Confidential Chats with Boys*, *Confidential Chats with Girls*, and *Start Your Child Right*.

DR. JOHN G. BLAKE,
Boston.

For twenty-two years Bostonians had been accustomed to see an old physician going in and out of his house on Beacon street. But the last call has been made, and Dr. John G. Blake, after a life of eighty years, went home to rest on March the 4th. He was just a twelve year old lad when he came over from Ireland, and he graduated from the Harvard Medical School in 1861, gaining there the great gift of the friendship of O. W. Holmes, who helped him not a little in his medical beginnings. He was attached to the staff of the Massachusetts General Hospital and went afterward to the Boston City Hospital as senior medical officer, serving also as consulting physician to Carney and St. Elizabeth's Hospitals. At the time of the Civil War he was examining surgeon of recruits, and headed a party of seventy-five New England surgeons who went to the Southern battlefields.

The Massachusetts Medical Society, the Boston Obstetric Society, and the Boston Society for Medical Improvement included him in their membership. He wedded in 1865 Mary Elizabeth McGrath, and added to the Boston population five boys and one girl, two of the sons, John and Gerald, following the medical trail.

News Items.

Palm Beach Hospital Building Fund Oversubscribed.—The campaign to raise \$60,000 for the Good Samaritan Hospital, of Palm Beach, Fla., to be used as a building fund, closed on March 11th with the fund oversubscribed \$9,000.

Army Medical Officer Dismissed from the Service.—First Lieutenant John G. Dwyer, Medical Reserve Corps, United States Army, who was recently convicted of neglecting his soldier patients at Camp Funston, has been dismissed from the service of the United States.

The Medical Society of the County of New York.—A stated meeting of this society will be held in Hosack Hall, New York, Academy of Medicine, Monday evening, March 25th, under the presidency of Dr. Howard C. Taylor. The evening will be devoted to a discussion of the subject of drug addiction. Papers will be read by Dr. Ernest S. Bishop and Dr. Charles F. Stokes, and the discussion will be opened by Dr. Charles L. Dana and Dr. Frank Van Fleet.

International Surgical Society to Be Dissolved.—At a meeting of delegates from Belgium, France, Great Britain, Serbia, and the United States, held in Paris on November 3, 1917, it was agreed that the International Surgical Society should be dissolved after the publication of the Transactions of the meeting held in New York on April 14, 1917. Should any money remain after the publication of the Transactions, such money will be divided pro rata among members. Each member of the Austro-German group will receive his share; but the money belonging to members from other nations will be retained and applied to some object of scientific reparation in Belgium. A new society will be created after the war on a similar basis, to be called the Inter-Allied Surgical Society. Surgeons of neutral countries may also be elected members.

Higher Rank for Medical Officers.—The Owen bill providing for higher rank for medical officers in the United States Army was the subject of a hearing before the Senate Military Affairs Committee at Washington on March 15th. Surgeon General Gorgas, Major Charles H. Mayo, and Major Franklin H. Martin appeared in behalf of the measure, which was apparently opposed by the Secretary of War. The increase in rank for officers of the higher grade was asked on the ground that when serving with the troops abroad the relatively low rank of the American medical officers militated against their usefulness and also subjected them to much humiliation. There seems to be a sharp difference of opinion between the Secretary of War and the Surgeon General on this subject, or at least this was the impression conveyed by the newspaper men at the hearing.

Dedication of the Warden McLean Auditorium.—The dedication of the Warden McLean auditorium at Camp Greenleaf, the military medical school at Camp Chickamauga, Georgia, on March 11th, was made notable not only because of the presence of the Surgeon General of the Army and members of his staff, as well as many distinguished medical men from military and civil life, but also because of the regular meeting there March 10th of the General Medical Board of the Council of National Defense, usually held in Washington. About 1,000 doctors, who as Medical Reserve officers are taking the three months' course, accepted the invitation to attend, extended by Dr. Franklin Martin, member of the Advisory Commission of the Council and chairman of the Board. The following members of the General Medical Board attended: Dr. Franklin Martin, chairman; Dr. William F. Snow, secretary; Surgeon General William C. Gorgas, Dr. Victor C. Vaughan, Dr. William H. Welch, Dr. John Young Brown, Dr. John G. Clark, Dr. Thomas S. Cullen, Dr. Edward P. Davis, Dr. William D. Haggard, Dr. Jabez Jackson, Dr. Edward Martin, Dr. Charles H. Mayo, Dr. Stuart McGuire, Dr. John D. McLean, and Dr. Hubert A. Royster. The cost of the auditorium was borne by Mrs. William McLean, who erected it in memory of her son, Warden McLean, who was accidentally killed while in the Officers' Training Camp at Fort Oglethorpe. Dr. John G. Clark, of Philadelphia, made the formal address of presentation.

Hudson Street Hospital to Care for Naval Patients. Wards in the Hudson Street Hospital, furnishing accommodations for about sixty-five patients, have been turned over to the Navy Department for the duration of the war. The institution has not been taken over by the government, the hospital merely offering its services in order to increase the local medical facilities of the Navy. Dr. Hughes Bayton and Dr. J. P. Hoguet will continue as heads of the medical staff.

Personal.—Dr. Edward Wallace Lee, of New York, a major in the Medical Reserve Corps, U. S. Army, has been ordered to report to the commanding officer, San Juan, Porto Rico.

Dr. Henry H. Goddard, for many years head of the research department of the Vineland, N. J. Training School for Backward and Feeble-minded Children, has been appointed head of the Bureau of Juvenile Research of the State of Ohio.

Civil Service Examination for Assistant Physician.—Among the positions for which the New York Civil Service Commission will hold examinations on April 27th is that of assistant physician in State hospitals, salary \$1,200 a year with maintenance. The examination is open to both men and women who are licensed medical practitioners, regular or homeopathic, in New York State, and have had six months' experience on the resident medical staff of a general hospital, or as a medical intern or clinical assistant in a State hospital or institution, or have been engaged for one year in the practice of medicine. Unmarried men are preferred. For proper application for and further information regarding the scope of the examination address the State Civil Service Commission, Albany, N. Y.

Meetings of Medical Societies to Be Held in New York during the Coming Week.—Monday, March 25th, Medical Society of the County of New York; Tuesday, March 26th, New York Academy of Medicine (Section in Obstetrics and Gynecology), New York Psychoanalytic Society, New York Dermatological Society, Metropolitan Medical Society of New York City, New York Medical Union, New York Otological Society, New York City Riverside Practitioners' Society, Valentine Mott Medical Society, Washington Heights Medical Society, Therapeutic Club; Wednesday, March 27th, New York Academy of Medicine (Section in Laryngology and Rhinology), New York Surgical Society, New York Society of Internal Medicine; Thursday, March 28th, Ex-Interne Society of Seney Hospital, Brooklyn, Hospital Graduates' Club, New York, New York Physicians' Association; Friday, March 29th, Academy of Pathological Science, New York, Hospital Graduates' Club, Brooklyn.

A School of Neurological Surgery in Philadelphia.—A third course in neurological surgery under the direction of the Surgeon General's office has been started in Philadelphia, and is now being given at the Jefferson, Philadelphia General, and University hospitals. The course has been arranged especially for the instruction of Medical Reserve officers to whom will be assigned the care of those suffering from injuries to head and spine.

It covers a period of ten weeks, with thirty-one hours of work a week, and includes demonstrations, lectures, clinics and quizzes. Operative clinics are held eight hours a week at the University and Jefferson Hospitals, and special lectures by authorities from other cities are arranged for from time to time. The teaching staff includes Dr. Charles W. Burr, Dr. John Chalmers DeCosta, Dr. John B. Deaver, Dr. G. M. Dorrance, Dr. E. L. Eliason, Dr. George Fetterolf, Dr. Lewis Fisher, Dr. Charles H. Frazier, Dr. T. B. Holloway, Dr. Chevalier Jackson, Dr. John A. Kolmer, Dr. Paul A. Lewis, Dr. James H. Lloyd, Dr. S. DeW. Ludlum, Dr. D. J. McCarthy, Dr. J. W. McConnell, Dr. R. Tait McKenzie, Dr. Charles K. Mills, Dr. George P. Muller, Dr. H. K. Pancost, Dr. George A. Piersol, Dr. Charles S. Potts, Dr. William C. Posey, Dr. B. Alexander Randall, Dr. William G. Spiller, Dr. E. A. Thomas, Dr. T. T. Thomas, Dr. T. H. Weisenburg, Dr. Andrew H. Woods, Dr. William Zentmayer, Major Thomas Johnson, Major George M. Piersol, and Captain Laurence Selling, of Portland, Oregon.

The director of the school is Dr. Charles H. Frazier, and Captain Thomas M. Joyce, of Portland, Oregon, is adjutant. University Hospital is headquarters.

Modern Treatment and Preventive Medicine

A Compendium of Therapeutics and Prophylaxis, Original and Adapted

Indigestion.—Guthrie Rankin (*Practitioner*, January, 1918) states that much of the confusion now experienced in formulating treatment for indigestion can be avoided if we divide all cases into two classes, the tonic and the atonic. The former is met with in well nourished, full blooded people with good appetites, perhaps more frequently in men, the latter most often in women, but also in men of poor physique, who are badly nourished. The treatment of both varieties may be divided into three great measures of correction: habitual routine, dietetic correction, and medicinal alleviation. In every case the ordinary habits of life have to be changed and adequate attention paid to the possible bearings of a well considered and carefully maintained routine. The bath in the morning should be hot, from 95° to 105° F., and may be terminated by a cold douche, if the patient is sufficiently robust. While in the bath gentle massage should be applied over the abdomen. A vigorous toweling ought to follow the bath, and be succeeded by a smart rubbing of the abdominal muscles. A weekly Turkish bath is of service to vigorous patients. The clothing should meet the requirements of the weather, and, when needed, an abdominal support should be worn. Daily exercise in the open air should be prescribed. Six to eight hours should be devoted to sleep, and a restful Sunday in bed once a month is of great value. The first necessity of dietetic correction is to limit the supply of sugar and starch. Uncooked fruits and vegetables must be forbidden. Red meat should constitute a moderate element in the bill of fare, and tea allowed only once a day, if at all. Atonic patients require time before they can assimilate comfortably a mixed diet, and the best guide to a relaxation of strict dietetic rules is an increase of weight with progressive gastric comfort. In severe cases the patient may be put to bed for a few days and fed entirely on milk, three or four ounces when not asleep. The milk may be made easier of assimilation by adding to it two grains of citrate of soda to the ounce, or by peptonizing it. After this, or at once in cases not bad enough for this degree of restriction, he recommends the following diet scheme:

Breakfast.—Weak coffee with milk, without sugar, but sweetened if necessary with saxon. Toasted bread with butter. To this meal may gradually be added an egg, boiled, poached, or scrambled; a small piece of white fish; or oatmeal with cream.

Luncheon.—White meat, simply cooked, in moderate amount, with toast or potato chips. Water biscuit thickly spread with lactic acid cream cheese. As improvement occurs, lamb, mutton, veal, chicken, or game may be allowed. The gradual addition of a puree of green vegetable, thoroughly cooked, is desirable. Later on, stewed fruit in the form of a puree, sweetened with glycerine and saccharine, may be given, with the addition of cream.

In the afternoon, cocoa or hot milk with dry toast and butter.

Dinner.—Jelly made from chicken, veal, or mutton, and a pudding of milk and egg, custard, omelette, or junket, with cream. Subsequently white fish, an egg entree, any kind of bird, occasional farinaceous puddings and soufflés are permissible.

At bedtime.—A cupful of hot milk, Benger's food, malted milk, or thin arrowroot is grateful and often promotes sleep. To patients accustomed to stimulants, one tablespoonful of whiskey or brandy, taken in a table water, at the end of luncheon or dinner is often advisable. In atonic cases a light red wine, or stout, may be substituted for spirits at the mid-day meal when convalescence is established.

A gradual return may be made from such a dietary to ordinary meals according to digestive capacity, but the rule of limiting red meat and tea to once a day, of avoiding uncooked vegetables, and of adhering to a small daily intake of sugar and starch should not be departed from until complete comfort is permanently restored.

Medicinal treatment aims at fortifying the dietetic restrictions by disinfecting the gastrointestinal tract, and by assisting nature to restore to a normal condition all of the tissues and secretions concerned. In tonic cases to lessen the gastric secretion, soothe the mucous membrane steady the nervous centres, and control microbic activity; for this he recommends:

R Extracti valerianæ, gr. ij:
Acidi carbonici pur. gr. ij;
Sodii arsenatis, gr. 1/40;
Codeinæ, gr. 1/4;
Pillule rhein co, gr. iss.

Ft. capsul. Signa: One to be taken three times a day after meals.

To counteract the hyperacidity:

R Magnesii carbonatis, gr. x.
Bismuthi carbonatis, gr. xxx;
Sodii bicarbonatis, gr. xxx.

Ft. pulvis. Signa: One to be taken when there is heartburn.

The following antibilious pill also is recommended for occasional use:

R Hydrargyra subchloridi, gr. j;
Extracti colocynthidis, gr. iii;
Extracti belladonnæ, gr. 1/8;
Extracti colchici, gr. 1/3.

Ft. pilula. Signa: One to be taken once or twice a week at bedtime.

When needed, a simple saline may be taken early in the morning, or a tablespoonful of liquid paraffin once a day.

In the atonic variety the conditions are different; the gastric secretion is diminished, the muscular vigor of the stomach is feeble and there is lack of nerve energy. For these he recommends:

R Papain, 3ss;
Acidi hydrochlorici dil., 3iij;
Glycerini acidi carbonici, 3ij;
Liquoris strychniæ, 3j;
Codeinæ, gr. iv;
Aque chloroformi, ad 5vj.

Misc. Signa: One tablespoonful to be taken in half a sherry glassful of water two hours before each meal.

In extreme cases it is sometimes better to replace the strychnine by calumba or gentian, and to administer the strychnine by hypodermic injection twice daily. The pill suggested for use in the tonic type may be used with the colchicum omitted, while the saline and liquid paraffin ought to be used in the same way.

When improvement has set in and a more liberal diet can be given, a change of medication is desirable. In tonic cases a combination of small doses of one of the bromides with glycerophosphates is often good. In atonic cases the tone of the body needs to be built up and the following is better:

R Ferri redacti,	gr. iij;
Betanaphthol,	gr. iij;
Strychnine,	gr. 1/40;
Codine,	gr. 1/4;
Pilule asafetideæ co,	gr. ij.

Ft. capsule. Signa: One to be taken three times a day after meals.

Other forms of iron may be substituted later when advisable. Patients with rheumatic tendencies need to have these attended to, and in some cases insomnia will call for the administration of seven grains of medinal, ten grains of chloretone, or twenty grains of chloralamide for three or four nights in succession.

Treatment of Hookworm Infection.—Samuel T. Darling, M. A. Barber, and H. P. Hacker (*Jour. A. M. A.*, February 23, 1918) present a careful and extensive analysis of their observations as to the methods of treating patients with hookworm infection in the Tropics, and with reference to the relative value of oil of chenopodium and thymol. In the case of the comparison of these two drugs the tests were made on the same patients, the number of worms expelled by each drug being compared. It was found that in maximal doses the two drugs were about equally effective, but, when submaximal doses were used, the efficiency of thymol suffered relatively very much more than that of oil of chenopodium. The maximum dose of thymol was found to be three doses of two grams each (30 grains) in powder, doses above this not improving the results. With oil of chenopodium the maximal dose was one mill for three doses at hourly intervals. When two successive treatments with approximately half doses of thymol were given, the efficiency was not much increased, while two treatments with half doses of oil of chenopodium showed a decided increase in efficiency, especially in the removal of the more resistant necators. This fact was greatly to the advantage of chenopodium, since each treatment was both safer and less likely to cause even minor disturbances. In the case of both drugs the treatment should be given with freshly made preparations, the thymol being freshly powdered and the oil being freshly placed in ordinary hard gelatin capsules. The use of oil of chenopodium in soft capsules gave results far inferior to those obtained from the same oil, in the same doses, but removed from the capsules. This was due to the fact that such thick-walled capsules did not undergo sufficiently prompt solution in the digestive tract. With the two treatments with half doses of oil of chenopodium there were almost no after effects, but with larger single doses and with

the effective doses of thymol subjective symptoms were frequently complained of, specially dizziness and stupor. A further advantage of chenopodium over thymol was its greater efficiency than thymol against other forms of intestinal worms. The use of a diet of rice gruel on the day preceding the treatment and milk only on the morning of the day of treatment gave the best results so far as the influence of diet was concerned. On this diet the initial purge might be omitted without diminishing the efficiency of the treatment when oil of chenopodium was used. The treatment should always be followed by a purge of two ounces of a concentrated solution of magnesium sulphate given about one hour after the last dose of the vermifuge. Other vermifuges than these two were also tried and it was found that oil of eucalyptus was very feeble, that chloroform was somewhat more effective, that the two in combination were more efficient than the sum of their efficiencies, but that even then they did not compare at all favorably with either thymol or oil of chenopodium.

Treatment of Fractures in Warfare.—W. Arbuthnot Lane (*Lancet*, January 5, 1918) criticizes much of the practice of surgeons in this field as incompetent and improperly carried out, and offers a number of conclusions as to what should be done in order to secure the best results. Plating should be performed in the presence of a foul wound only in very exceptional circumstances, and when used in such cases provision should be made for absolutely free drainage. Also, if plating must be resorted to under such conditions, the screws should be inserted as far from the site of fracture as possible. In all other cases operative interference should be postponed until the wounds have been healed for some time and the likelihood of latent infection reduced to the minimum. In such cases if there is a focus of infection found at operation a vaccine should be made from the organisms present and used at once if symptoms of infection develop. If there is suspicion of a latent sepsis Carrel's treatment should be adopted immediately, otherwise the wound should be closed completely. Every possible attempt should be made to prevent shortening of the limb and no bone should ever be removed to obtain accurate apposition of the fragments. It is not necessary to secure apposition of the entire areas of the broken ends, as the interval will fill with new bone promptly. Fragments of bone and of callus should be saved and used to fill in intervals between the ends. Much heavier steel plates than are used in civil life must be employed in the badly comminuted and malunited fractures due to projectiles. The joints near the fracture should be moved as early as possible to prevent stiffness and limitation of motion through contractures. If strain likely to cause non-union can be avoided, the patient should be made ambulatory as soon as possible to hasten repair. Intervals between fragments too great to be filled in by new bone can be bridged by bone removed from part of the circumference of one of the fragments or from some other part of the body. Most failures in grafting are due to dependence on the unsatisfactory grip of the graft alone on the fragments.

A Discussion of Some Principles of Anthelmintic Medication.—Maurice C. Hall (*New Orleans Medical and Surgical Journal*, February) enunciates the following general principles. Anthelmintics are selective in their action; at least, their dependable effectiveness is limited to certain sorts of worms, and some worms require not only a suitable anthelmintic, but also suitable modes of medication, while others require only one dose of a suitable drug. Fluid extracts or other preparations using alcohol as a solvent are frequently unsuitable as anthelmintics. Supposedly insoluble anthelmintics are not as insoluble as commonly supposed. Some anthelmintics at least probably do not need to be allowed time to act before purgatives are administered. Preliminary fasting is important. Gastric stasis may occasionally interfere with the efficacy of the drugs. The passage of worms following treatment is a better indication for repeating or continuing than for stopping treatment. Severe helminthiasis calls for caution in administering anthelmintics. While the majority of worms passed after anthelmintic treatment come away in the first twenty-four hours, a fairly large per cent. will commonly come away from one to six or seven days later. In the author's experiments the following percentages of different worms were passed in the first twenty-four hours:—Ascarids, 82.7%; hookworms, 74.1%; whipworms, 57.6%; dipylidium, 91%; taenia, 100%.

Occupation in the Treatment of Pulmonary Tuberculosis.—J. R. Byers (*Canadian Medical Association Journal*, January, 1918) comes to the following conclusions: Properly regulated work is highly beneficial to the sufferer from pulmonary tuberculosis, provided that the greatest care has been exercised in the selection of the work as adaptable to the patient, and that the patient cooperates willingly. Even patients who are confined to bed seem to progress more rapidly when allowed to fill out part of the day with some interesting finger work, instead of lying still and brooding over their lot. Contrary to expectation, relapses have been less than two per cent. among the patients thus treated under the writer's care, and in a year there has been only one small hemorrhage following exposure to the workshop. While the vocational training does not make a man a wage earner in a new field, it has in many cases started new lines of thought regarding the life to be led after discharge, and stimulated not a few patients to improve themselves and become more useful citizens. Occupation has improved the morale of the men remarkably. While the results of treatment do not show any marked change from those obtained in civilian sanatoriums, they are decidedly better than those obtained during the first year of military work. A comparison of the large percentage of men who refused treatment last year with the very small number now applying for release furnishes strong evidence that the men appreciate this method of loosening nervous tension and making the prolonged and tedious treatment bearable. Finally, Byers maintains that a fourth word should be added to the code for the treatment of pulmonary tuberculosis, which would then read, rest, fresh air, good food, and work.

Chronic Hyperacidity, Heartburn, and Sour Regurgitation.—Louis Fischheim (*Boston Medical and Surgical Journal*, January 17, 1918) asserts that hyperacidity and heartburn are separate gastric disorders, and that both are forms of nervous dyspepsia. Nervous dyspepsia is either a symptom or part and parcel of a general neurosis. Hypersecretion is not invariably associated with hyperacidity, as it occurs at times in hypacidity. Constipation is either a secondary or a coordinate symptom of a general or local disorder, and not its cause. The nervous symptoms in habitual constipation are psychogenetic, and not the result of an autointoxication. No chronic functional disorder of the stomach exists independently. Any such disorder, when not a part of a general neurosis, is due to some organic affection anywhere within the body. The anomalies of motility, when functional, are clinically of little importance, and do not require any treatment apart from the treatment of the condition with which they are associated. Hyperacidity is treated by a carefully selected mixed diet, with the exclusion of meat, and by alkalis. The treatment of heartburn is empirical.

Sulphur Dioxide in Gonococcal Urethritis.—M. Lacombe (*Prose médicale*, January 3, 1918) asserts that by suitable use of sulphur dioxide the gonococcus can be reached even in the deeper layers of the urethral mucosa and results thus secured which no other method has as yet given, even in advanced cases of acute urethritis and in chronic urethritis. Two solutions are employed, the first obtained by dissolving six grams of picric acid in one litre of water; the second, containing seventeen grams of sodium hyposulphite in the same quantity of water. At each injection a mixture of four mils of the first solution with one mil of the second is administered. The two chemicals react in the urethra, with formation of two to three mils of sulphur dioxide gas, as well as sodium picrate and free sulphur. The liberation of gas proceeds rather slowly, being complete only after about twenty minutes. The volume of the lumen of the infected anterior urethra being about five mils, which is completely occupied by the five mils of solution, the sulphur dioxide exerts pressure on the urethral walls and soon penetrates into all glandular diverticula, cellular interstices, etc., in which the gonococcus lurks and is protected from antiseptics as usually applied. In beginning acute urethritis, and in established anterior urethritis, five mil injections are given three times daily; in established anterior and posterior urethritis, six mil injections are substituted in order to reach the posterior urethra. In the period of decline in acute urethritis, and also in chronic urethritis, a single six or five mil injection is given daily, according to whether the three glass test is positive or negative. Appropriate internal treatment, with rest and a suspensory, is also ordered. The injections are painless. Each time the solution should be retained at least fifteen minutes. Each of the two solutions should before use have been heated to body temperature. Use of the method in 130 cases yielded excellent results as regards both rapidity and permanence of recovery. The thickest discharge and the most obstinate oozing were alike promptly arrested.

Serum Prophylaxis of Gas Gangrene.—E. Vaucher (*Presse médicale*, January 3, 1918) reports clinical experiences with a serum against the perfringens and oedematous organisms and the septic vibrio. The mixed serum was found to be well borne, causing no noteworthy reaction even in wounded subjects who had previously received antitetanic serum. Prophylactic administration of the mixed serum is advised in all severe wounds of the extremities, with or without fracture, especially in the presence of injuries to large vessels. The mixed serums being well tolerated, it might even prove advisable to administer twenty mil doses of each of the serums separately. Where a rapid influx of wounded or the poor general condition of the individual himself prevents prompt surgical treatment, the prophylactic serum injections should be repeated for several days.

Artificial Pneumothorax in Nontuberculous Lung Abscess.—W. D. Tewksbury (*Journal A. M. A.*, February 2, 1918) reports his results in the treatment of lung abscesses which followed operations on the nose or throat. Ten cases of this type were treated by the production of artificial pneumothorax and of these six patients were cured, two were only temporarily improved, and two died. In four of the cases the abscess was of less than two weeks' duration and all four were promptly cured. The six remaining cases had lasted for longer periods of time, and of these two patients were cured, two were improved, and two died. It would seem that the prognosis was better when the treatment was begun early in the history of the abscess than when first started after the lapse of several weeks. In general the pneumothorax was small at first and was increased as it was repeated.

The Healing of Burns under Paraffin Dressings.—Fauré-Fremiet and Pfulb (*Bulletin de l'Académie de médecine*, December 29, 1917) made a detailed study of the effects of a malleable, closely fitting, but nonadherent paraffin dressing, in particular Barthe de Sandfort's ambrine, on the healing of burns. Such a dressing, even in extensive burns, soon allays or completely removes pain. The dead tissues are eliminated easily and the wound soon presents a red, granulating surface. Epidermal proliferation begins at once, both from the margins and from islets of epidermis established in some fortuitous manner. Throughout the period of healing there is produced a puriform exudate, sometimes very copious, and which consists essentially of polynuclear leucocytes and a serous fluid. This exudate always contains, in spite of an active phagocytosis, numerous living bacteria, especially the pyogenic cocci, the pyocyanous organism, and a few organisms from the air. Comparison with wounds treated with Dakin's fluid showed that healing takes place just as rapidly, and perhaps even more rapidly, under ambrine than under the Dakin fluid, notwithstanding the copious suppuration. An explanation of this apparent paradox was obtained upon histologic study of the reparative process. Under the paraffin dressing a loose network of connective tissue is rapidly formed with active vascular organization. The chief elements in the network are the fixed connective tissue cells, many of which are

seen in mitosis, and certain mobile cells, especially polynuclear leucocytes, which are constantly passing out through it. The granulating surface thus becomes covered with a species of false membrane formed of degenerated leucocytes fixed in a network of coagulated fibrin, and this membrane seems to play temporarily a protective rôle, disappearing only as the epidermis advances. Beneath the false membrane, even in the newly formed tissues, no microorganisms are to be found. If infection accidentally does penetrate beneath this membrane, the granulation tissue becomes necrotic and a secondary slough is formed. Otherwise, protected by the paraffin dressing, the new tissues develop in an aseptic manner simply by virtue of the normal defensive processes of the organism and without the intervention of any antiseptic substance.

Treatment of Hemorrhoids.—Charles J. Drueck (*Chicago Medical Recorder*, December, 1917) recommends that hemorrhoids be operated upon under combined local anesthesia and morphine and scopolamine narcosis. He points out the great difficulty of securing any satisfactory anesthesia in the region of the rectum by nerve blocking. His technic consists of the preparation of the patient by thorough emptying of the bowels with a laxative the day before the operation; giving only light, easily digestible diet; then shaving the perineal region and applying a sterile dressing the night before. Three hours before operation an enema is given, and one hour before, a cup of soup or milk, at which time fifteen milligrams ($\frac{1}{4}$ grain) of morphine, 0.6 milligram ($\frac{1}{100}$ grain) hyoscyne, and 0.4 milligram ($\frac{1}{150}$ grain) of atropine are injected. The same precautions for the exclusion of external stimuli should be observed as in the case of "painless childbirth." The skin in the median raphe, $1\frac{1}{2}$ inches behind the anal margin, is touched with pure phenol and after a few minutes' infiltration, anesthesia with warmed half per cent. novocain solution is begun at this point and carried forward to include both sides of the anus. The process is then repeated, beginning at the anterior commissure. The mucosa of the anus is next anesthetized by the insertion of a wad of cotton soaked in ten per cent. quinine and urea hydrochloride. After ten minutes the left index finger is passed into the rectum, hooked over the anal muscles and the anus put on the stretch. A little over one mil of the novocain solution is then injected into the anal muscle on each side and in front and behind, and one syringe of solution is injected immediately in front of the coccyx. After five minutes the anesthesia is complete, the sphincter is well relaxed and can be dilated to its fullest extent without danger of injury. With the piles thus exposed, each is infiltrated with half per cent. solution of quinine and urea hydrochloride and the mucosa for half an inch above is included. After five to ten minutes the hemorrhoids can be dissected out painlessly by lateral incisions at their bases, made in the long axis of the rectum. Then the hemorrhoid is freed to its pedicle, this is ligated and the end of the ligature, threaded on a needle, is passed through its base and tied over the top of the stump after cutting off the pile close to the base. The incision is closed with a running catgut suture.

Etiology and Treatment of Trench Foot.—Joshua L. Sweet, George W. Norris, and Harry B. Wilmer (*Journal A. M. A.*, February 16, 1918), from a study of the conditions encountered in the affection known as trench foot, believe that it is due in part to an incomplete spasm of the arterioles of the foot closely analogous to the condition seen in Raynaud's disease or erythromelalgia and probably due to some factor which either increases the vasoconstrictor substances in the blood, or diminishes the vasodilator substances. Whatever the precise cause, the thyroid gland is capable of producing a peripheral vascular relaxation when overactive and the administration of iodine is the best available means of causing an overactivity of this gland in the absence of the dried substance. The plan of administering large daily doses of potassium iodide in doses of 1.3 to two grammes three times daily was tried in a series of thirty-one cases of trench foot and produced marked to complete prompt relief of the pain in all but two of the cases without the need for the use of anodynes or analgesics. It was found that in cases of trench foot the blood pressures in the legs were regularly higher than in the arms, contrary to the normal equality of the two. The use of iodide reduced the leg pressures to the level of the arm pressures in thirteen cases in which the observations were made. The reduction in leg blood pressure seemed somewhat parallel with the degree of relief of the pain. The observations need further confirmation according to the authors.

Excision of Hemorrhoids under Local Anesthesia.—E. E. Morrison (*Journal of the Kansas Medical Society*, December, 1917) recommends the following method as giving the best of results without the necessity for the use of a general anesthetic with its uncomfortable sequelae. The patient is given sixty mils—two ounces—of castor oil thirty-six hours before operation and twelve hours before he is given repeated soapsuds enemas until the water returns clear. Twenty-four hours before operation he is put on a soft diet, which is continued for three days after operation. An hour before operation he is given a hypodermic injection of sixteen mgm.—0.25 grain—of morphine with 0.6 milligram—0.01 grain—of atropine sulphate. The patient is placed in the Sims position for operation and the whole field is sterilized by scrubbing with soap and water, followed by sponging with seventy per cent. alcohol. A 0.25 per cent. solution of novocaine with epinephrine is used for anesthesia. With a one inch needle on a five mil syringe the first injection is made beneath the epidermis just outside of the mucocutaneous junction behind the anus. From here by a series of wheals a ring of tissue entirely surrounding the anus is anesthetized, ten mils of solution being usually required. Then, using a needle two and a half inches long, the deeper tissues are anesthetized by inserting a finger into the rectum as a guide. The needle is first introduced into the anterior portion of the sphincter, where ten or twelve drops of the solution are injected. The needle is then pushed deeper and deeper, making injections after every increase in depth, until the whole length of the needle has been inserted. About four mils of the solution are required. The needle

is then withdrawn until it just escapes from the sphincter and it is then passed into the tissues just outside of that muscle which are injected with the remaining mil. This process is repeated on each side of the anus, in front of and behind it, and in each perianal quadrant. After two or three minutes from the completion of the injections the anus is dilated by inserting an increasing number of fingers until the dilatation is maximal. The hemorrhoids are then removed by one of the well known and accepted methods.

Radium Treatment in Diseases of the Skin.—W. Knowsley Sibley (*Urologic and Cutaneous Review*, February, 1918) describes the various rays and the forms of apparatus used in their administration. A large number of different skin diseases and conditions have been satisfactorily treated with radium, but the best results appear to have been obtained in cases of superficial rodent ulcer, nevi, and in keloids. In these diseases the lesions may be removed without any obvious scar remaining. Rodent ulcers have been cured in one exposure.

Röntgen Therapy in Epithelioma.—Albert F. Tyler (*Urologic and Cutaneous Review*, February, 1918) treats all cases where there is no lymphatic involvement or evidence of metastases with the Röntgen rays. He prefers the Röntgen rays because they are painless and because they do not necessitate a period of residence in a hospital. The scar obtained is minimum. The tendency is to give too small a dosage. There are two methods of treating with the Röntgen ray, the fractional dose method and the massive dosage. When the patient can stay for a long period of time the fractional dose method is better. When the patient must leave soon, massive doses are given.

Chronic Cystitis.—I. S. Stone (*American Medicine*, January, 1918) regards the administration of drugs by mouth as useless in this condition. If the urine is of high specific gravity it should be diluted by the free administration of water. The principle underlying the treatment of cystitis is to treat it as a local disease. At each treatment the bladder should be filled with hot normal saline solution or two per cent. boric acid solution. Two ounces of a one or two per cent. solution of protargol may be left in the bladder. Trigonitis requires special local applications such as five or ten per cent. silver nitrate solution. These should be applied through the cystoscope if possible.

The Importance of Diastolic Readings in the Differentiation and Treatment of High Blood Pressure Cases.—O. K. Williamson (*Practitioner*, February) lays stress upon these points: 1. That the determination of diastolic pressure, in addition to systolic, enables the physician to distinguish high blood pressure cases in which there is increased peripheral resistance from those in which the peripheral resistance is not raised, which may conveniently be called the atheromatous cases. 2. That, having made the diagnosis, he can adopt treatment directed toward reducing the increased peripheral resistance in suitable cases of this variety, whilst as regards the atheromatous type such measures will clearly be uncalled for.

Miscellany from Home and Foreign Journals

Acute Lobar Pneumonia.—F. C. Shattuck and C. H. Lawrence (*Boston Medical and Surgical Journal*, February 21) have studied the four thousand odd cases of lobar pneumonia treated at the Massachusetts General Hospital from 1822 to 1917 inclusive, and the results are somewhat surprising. They tell us the mortality has gradually increased from ten per cent. in the first decade to twenty-eight per cent. at the present time. Since 1881 there has been no significant change in the death rate. The number of cases classed as delicate or intemperate has been decreasing during the same period. The apparent increase in complicated cases is probably due to increased accuracy of diagnosis and recording. The relative number of foreign born patients is increasing, the mortality among them diminishing. The death rate among American born patients has increased slightly, also the mortality among men as compared to women; this may be due to a corresponding increase in vascular diseases during the period studied. Treatment has done nothing toward diminishing the mortality from pneumonia in the past ninety-five years. Of particular interest is the evidence offered by the figures upon the effect of alcohol. Its habitual use in more than moderate amounts during health is shown to diminish the patient's chances of recovery, but the mortality rate among patients who were given large amounts of alcohol during their illness is no higher than among those given no alcohol and large amounts of fresh air. The figures do not indicate that alcohol is harmful to those sick with pneumonia, they suggest that the effect of the drug varies with the conditions under which it is given, and that it is not poisonous to those who have high temperatures and are taking insufficient nourishment. No change is to be expected in the results of treatment until a specific is discovered which will neutralize the toxins of the pneumococcus. The results from the serum now in use are encouraging, but limited, and until its use becomes accepted, the treatment of pneumonia must be that best suited to the individual. No routine treatment has been justified by its results.

Minor Cardiac Disturbances Following Slight Infectious Myocarditis.—Camille Lian (*Presse médicale*, January 7, 1918) protests against the prevailing tendency to consider all cases of palpitation in soldiers of the same nature and to class all patients without distinct valvular or aortic lesions, or thyroid or tuberculous disease, in a single group termed "irritable heart of the soldier" or "the effort syndrome." To consider all cases of irritable heart a tachycardiac neurosis, based on a constitutional sympathetic neurosis which is aggravated or brought to light by some other morbid influence—an infection in half the cases; in the remainder, gas intoxication, concussion, emotion, chest wound, etc.,—is to pay too little attention to the actual cause and to recognize too easily a constitutional nervous predisposition. Most of the author's subjects had had no dyspnea or palpitation before their infectious attack, the latter usually an acute rheumatism.

Some subjects had had cardiac disturbances since childhood, even in the absence of any appreciable causative disease, accident, or mental shock; these Lian classes independently under the term "constitutional circulatory debility." The minor cardiac disturbances especially referred to, occurring under war conditions as a sequel to infection, should be classed separately from the irritable heart due to physical effort. Among 350 cases of cardiac disorder in soldiers, Lian classed seventy in the minor cardiac disturbance group; forty-three others were irritable, war hearts; eleven, disturbances due to concussion or emotion; four, due to asphyxiant gases; forty-six, cases of constitutional circulatory debility; thirty-five, of valvular disease; thirty-two, of arterial hypertension; four, of arterial hypotension; fourteen, of heart disturbance of digestive origin; twenty-seven, of heart disturbance of respiratory origin; eighteen, of heart disturbance of nervous origin—distinct neuropaths or with a complicating left sided intercostal neuralgia;—seven, convalescent cases; and thirty-nine, miscellaneous doubtful cases. The prognosis in the cases of minor cardiac disturbance is rather good, though the myocardial impairment may become increased upon recurrence of the original infection or exposure to an intercurrent infection or intoxication. The treatment, in the acute myocarditic stage, consists in overcoming the causative infection; in the chronic stage, of hygienic, symptomatic, and mild cardiotonic measures. In the hospital, the chronic subjects should not be kept idle, but given light tasks to perform. Ultimate disposal of each subject is based upon physical tests of cardiac functional capacity.

The Blood in Shock and Hemorrhage.—W. B. Cannon, John Fraser, and A. N. Hooper (*Jour. A. M. A.*, February 23, 1918) investigated the distribution and character of the blood in traumatic shock among soldiers and found that the red cell count of blood taken from the various capillaries was higher than that from the blood from a vein, and that the discrepancy was the greater the more profound the shock, amounting to as much as two million corpuscles. In such cases the venous count was approximately normal and the high capillary count indicated a stagnation of the corpuscles in the capillaries due to a retardation of the circulation through them. This condition was only slowly recovered from when once established. In hemorrhage and after shock complicated by hemorrhage the hemoglobin was low as compared with the red cell count, and the same was true after operations complicated with hemorrhage. Transfusion of whole blood raised the red count and hemoglobin, while infusions of hypertonic salines or gum solutions reduced both red count and hemoglobin. Small amounts of hypertonic saline did not have this effect, due to the reduction of the capillary stasis and the absence of material dilution. If the concentration of capillary blood continued for several days after injury it indicated a continuation of an unfavorable condition; its disappearance indicated improvement.

Personality in Paresis.—Michael Osnato (*Journal A. M. A.*, February 16, 1918) calls attention to the fact that Meyer, Hoch, Jelliffe, and others have shown that the personality of an individual plays an important part in the development, nature, and progress of various types of psychoses and brings forth a series of his own cases which tend to show that personality also is an important factor in determining the type of manifestations found in cases developing general paresis. Several detailed case records are presented to demonstrate the role of personality, and in thirty-seven cases twenty seem to show that the development of the psychotic type of paresis occurs in persons originally having certain abnormalities of mental make-up. The personalities of those who are most prone to develop the psychotic type of paresis include the neurotic, seclusive, and emotionally unstable ones specially. In view of these facts it would seem more important to lay special stress on the efficient early antisyphilitic treatment of such persons because of their tendency to develop paresis. The results of the investigation also seem to indicate that there is little in the theory of special strains of the spirochete which produce paresis, since the special susceptibility would seem rather to lie in the individual.

Ludwig's Angina.—Halphen (*Presse médicale*, January 7, 1918) reports a case of phlegmonous inflammation of the floor of the mouth mistaken for Ludwig's angina and in which recovery was obtained after drainage through the mylohyoid muscle and removal of the wisdom tooth. The latter had been the starting point of the infection. Osteoperiostitis of dental origin is often erroneously labeled adenitis or adenophlegmon. The teeth having no lymph canaliculi, the infection, unless a lesion of the mucous membrane exists, always travels from the dental pulp to the bone, thence to the periosteum and the cervical cellular tissue, forming what Sèbilleau has termed a periperiostitis. Removal of the tooth is generally sufficient to overcome this condition. True Ludwig's angina, which is rare, is characterized especially by the gravity of the general symptoms, the patient succumbing even before pus has collected. It is thus notably different from edema, phlegmonous inflammations, and abscesses of the floor of the mouth, rather frequently met with and amenable to drainage, a well marked collection of pus, always with a putrid odor, being evacuated. In Ludwig's angina the muscles are found sphacelated. Points of resemblance consist of the almost exclusively anaerobic bacterial flora, analogous to that of pulpitis and dental caries, and the characteristic situation of the disease process. Ludwig's angina is actually a misnomer, the disease having been discovered by Gensoul five years before Ludwig. The condition is merely a hypertoxic form of the gangrenous phlegmons involving the floor of the mouth, just as massive gangrene may set in in severe wounds of the extremities and in fulminating appendicitis. In involvements of the floor of the mouth general anesthesia nearly always leads to syncope, sometimes fatal, and should be replaced by local anesthesia or anesthesia by intercricothyroid laryngotomy.

Meningococcal Infection.—A. Netter, Marius Saloniér, and Mlle. Blanchier (*British Journal of Children's Diseases*, October-December, 1917) in studying this subject conclude that: 1, the meningococcal nature of the diplococci in the purpuric spots of cerebrospinal meningitis can rapidly be established; 2, the morphological characters of the cocci in the preparations appear to be sufficiently convincing; 3, in two patients the fluid withdrawn by lumbar puncture remained normal, and in a third case it was normal at the first puncture; 4, in two cases the strain of the causal meningococci could be determined. They were not agglutinated by the typical antimeningococcal serum but by that prepared against a strain of meningococci which other observers have shown to be frequently active among the English troops. In cases of purpura with meningitis the type of meningococcus differs from the ordinary strain and for this reason a polyvalent serum is of value.

Teratogenic Rôle of Attempted Abortion.—Nageotte-Wilbouchewitch (*Presse médicale*, December 20, 1917) reports a number of cases suggesting that unsuccessful attempts at abortion may result in definite malformations in the offspring. The stage of intrauterine life at which the injury has taken place and the malformations noted may be compared with known chronological facts in human embryology. The first case referred to showed an abnormal elevation of the right scapula, a suggestion of club hands, short ring fingers, abnormally arched feet, a supernumerary toe, evidences of incipient hare lip, supernumerary canine teeth, maxillary and dental deformities, small branchial fibrochondromas, and a series of angiomata on the neck. No hereditary malformation could be traced, nor were there any indications of syphilis or alcoholism. Study of the malformations suggested a disturbance occurring not later than the sixth week of intrauterine life. Inquiry revealed that at about the end of the third week of pregnancy a number of nonsurgical measures, including drastic purgatives, had been carried out in an attempt at abortion. Four other cases are described in which various deficiencies in the offspring seemed due to similar attempts, viz., idiocy; congenital stenosis of the rectum, with hemivertebrae and absence of one rib; absence of the radius; complete epispadias, with luxation of both fibulas. The author has in mind a number of additional cases of the same type. These subjects are characterized, as a group, by robust health apart from the malformations; children with inherited taints, on the other hand, are, as a rule, puny, ugly, and otherwise unattractive. Experiments illustrating malformations due to injections of morphine or lead nitrate in hen's eggs, or to exposure to vapors of chloroform, absinthé, etc., have been performed by Féré. By destroying one or more cells in the eggs of ascidians, Chabry has produced various monstrosities through deficient segmentation. The malformations correspond strictly to the cells or groups of cells destroyed, whether the destruction itself be accomplished by a poison, mechanical puncture, capillary hemorrhage, thrombosis, a spirochete, or the tubercle bacillus.

Type Determinations of Pneumococcus Infections.—Warren T. Vaughan (*Journal A. M. A.*, February 16, 1918) says that the cultural method of Avery has given complete satisfaction so far as its practical results are concerned. Vaughan's work with the method was done in army base hospitals where the available facilities and materials are limited and he therefore gives an outline list of the essential articles required and the methods of preparation of the materials. The list contains many simple receptacles pressed into service with good results and should prove of much help to others similarly placed. In addition to the list of simplified apparatus, the technic is somewhat modified to meet the conditions, thus in the preparation of the tubes of medium a single pipette can be made to serve for the measuring of the broth into all the tubes and then for the glucose solution if care be taken to avoid its contamination. Strips of thin cardboard serve well to select and transfer suitable fragments of the suspected sputum to the tubes, and the ordinary wooden applicators serve well to secure the thorough breaking up of the sputum mass in the culture medium. Both of these implements can be burned and much sterilization thus avoided. Since serums for the several strains of pneumococci are none too abundant these can be economized. Thus Type I and II serums can safely be diluted to 1:10, and Type III to 1:5 before use, employing sterile physiological salt solution. Further economy can be secured by setting up the initial test with Type I diluted serum in one tube, Type II undiluted in the second, and Type III diluted in the third. This permits the immediate recognition of the atypical Type II organisms, which may then be differentiated from straight Type II organisms by a test with diluted serum. It is well in all cases to make a blood culture immediately and to perform the precipitin test on the urine after Blake's method in all cases on admission.

Induced Erythema in the Preeruptive Diagnosis of Measles.—H. Godlewski (*Bulletins et mémoires de la Société médicale des hôpitaux de Paris*, November 29, 1917) applies a cup to the chest or back and allows it to remain until congestion causes a capillary network to become clearly apparent. This usually takes but thirty to fifty seconds. Upon removal of the cup, a subject in the incubation or invasion period of measles exhibits, at the circle of contact of the cup, a uniformly tinted erythematous ring, varying in color from pink to purple, according to the period of time by which the test precedes the appearance of the measles eruption. The colored ring may be two or three fingerbreadths in width. It increases slowly in intensity, reaching the maximum only after three and a half minutes. It then slowly decreases, being still clearly visible five or six, or even ten, minutes after removal of the cup. Among normal individuals, three fourths show no erythema, the red network disappearing in less than three to five minutes provided the cup has not been left on too long. In the remaining fourth, an erythema does develop, but it increases in intensity much more rapidly than the measles erythema, reaching its maximum in a minute and a half or at most two minutes. At

three and a half minutes this normal, dermatographic erythema has already greatly diminished. Furthermore, it is much less regular in shape than the measles erythema, often forming merely an incomplete circle. Among 218 cases, the measles erythema was seen in eighteen, and in each of these eighteen measles developed within a period ranging from a few hours to four or five days after the test. In seven cases, all children, the measles erythema was seen three to five days before the beginning of the actual measles eruption. In each of these the induced erythema was the only sign suggesting the subsequent attack of measles. Nine cases showed the erythema one or two days before the true eruption. In two, soldiers admitted with a temperature of 38° C., slight oculonasal catarrh and a few macules about the angle of the jaw, cupping yielded great erythema, confirming a diagnosis of measles. In none of the 200 negative cases did measles develop. Morbilliform eruptions due to food intoxication failed to yield an erythema upon cupping.

Mycological Detection and Determination of Certain Carbohydrates.—Aldo Castellani and Frank E. Taylor (*British Medical Journal*, December 29, 1917) point out that various carbohydrates and other carbon compounds are regularly employed in the identification of certain of the bacteria and higher fungi and suggest that the process be reversed and the fungi and bacteria be employed for the identification of the carbohydrates and carbon compounds. In physiological and pathological work glucose, lactose, and maltose are the three sugars which commonly have to be distinguished. If a one per cent. solution of the suspected material be made up in peptone water and sown with *Monilia balcanica*, *Monilia parabalanica*, or *Monilia krusei* in one tube and with *Monilia pinoyi* or *Monilia tropicalis* in the other and then incubated at 37° C. for forty-eight hours the sugars can be differentiated. If both tubes show gas the sugar is glucose; if only tube 2 shows gas the sugar is maltose, and if neither shows gas it is lactose. Or bacteria may be used, showing tube 1 with *Bacillus proteus vulgaris* (Hauser, P. I. strain) and tube 2 with *Bacillus diffuens* and incubating. Gas in both tubes shows glucose; in tube 1 alone, maltose, and in neither, lactose. The test may similarly be applied to the differentiation of the substances which reduce Fehling's solution by using four tubes and inoculating as follows: Tube 1 *Molinia balcanica*; Tube 2 *Molinia krusei*; Tube 3 *Molinia pinoyi*; and Tube 4 with *Molinia metalon-dinensis*. After incubation at 35° C. for forty-eight hours the readings may be as follows: gas in all four tubes, the substance is glucose; gas in tubes 2, 3, and 4, the substance is levulose; gas in tubes 3 and 4, it is maltose; gas in tube 4 only, it is galactose; and no gas in any tube, it is lactose, a pentose, or a substance of the group of creatin, uric acid, or hippuric acid, etc. Other methods are described in the paper which include the mycological determination and differentiation of more than one reducing substance in a given material, and of certain nonreducing substances like saccharose, inositol, dextrin, etc. The method can be carried out readily on urine, provided there is not less than 0.1 per cent. of one of the substances present.

Proceedings of National and Local Societies

PHILADELPHIA COUNTY MEDICAL SOCIETY.

Meeting of Wednesday, Jan. 23, 1918, at 8:30 P. M.

The President, DR. FRANK C. HAMMOND, in the Chair.

SYMPOSIUM ON GOITRE.

The Pathology of Goitre.—Dr. A. G. ELLIS, in opening the meeting said: A few general points of the pathology of goitre are to be considered. Diagnosis and treatment are based upon the size of the goitre and the evidence of preversion of thyroid function rather than upon the exact pathology of the individual gland. In other words, size, contour, density, movability of the goitrous thyroid do not give trustworthy information regarding histology. Clinicians with large experience report that the symptoms are indicative of the structure of the thyroid, the Mayo clinic apparently reaching the greatest accuracy in this respect. McCarrison, however, claims that Graves' disease may exist with any form of goitre, many others believing this affection has no specific histology of the thyroid. The point to be remembered is that those whose experience includes dozens or scores of cases should be careful in their criticism of conclusions based upon hundreds or thousands of specimens. My limited study of goitrous thyroids has not led me to believe the pathological anatomy is easily predicated from the clinical symptoms. This refers especially to the exophthalmic goitre, which has the most striking symptomatology. If we drop the idea that each symptom-complex in goitre has its specific thyroid structure, our findings will not be so disquieting. The nomenclature of the histology of goitre is varied and confusing. Clinically, goitres may be divided into the nontoxic and the toxic. Those of the first group are of chief importance from the standpoint of influence on neighboring structures. They are termed simple or endemic goitre and include parenchymatous, colloid, cystic, and some of the adenomatous goitres. These types possibly represent very largely different periods in a chronic process marked by atrophy of essential cells and lessened function. Treatment is based upon symptomatology, and rules regarding the handling of local tissue overgrowths of all types apply here. Differentiation from true malignant tumors of the thyroid is sometimes difficult. Chief among the toxic goitres is the exophthalmic form with its well known but not always constant symptom-complex. The clinical features rather than the microscopic picture of the removed thyroid must be the deciding point in the classification of this type of thyroid. Some of the adenomatous goitres belong to the toxic group, the character of the colloid content determining the toxicity of the goitre. The point is, treatment of an individual case of goitre is guided primarily by the local or systemic accompaniments, and, secondly, by the fact that there is present a colloid, cystic, adenomatous, or hyperplastic thyroid. There should be, however, as accurate information as possible regarding the structure of diseased thyroids and a correlation of clinical findings, with the pathology

of every removed goitre, in the endeavor to determine the changes in the gland producing certain symptoms. Such knowledge may be an aid in diagnosis and treatment, and a step toward the elucidation of the cause of goitre. Regarding etiology, McCarrison believes that endemic goitre is an infection, the organisms reaching the alimentary tract through infected soil, water and food, and animal experimentation seems to substantiate his views. Exophthalmic goitre is also believed to be of infectious origin, although not so definitely as the endemic type.

Goitre from the Standpoint of the Internist.—Dr. JAMES M. ANDERS expressed an opinion that in the discussion of goitre the great point to be stressed is that really useful information is better obtained from a few recorded cases accurately and thoroughly studied rather than from many superficially observed. While the principal symptoms of the disease are apparently due to overactivity of the thyroid gland, cases are seen to develop in the course of other toxic conditions. The writer had observed two well marked instances secondary to rheumatism in which cure was effected by the use of the salicylates. Cases are recorded of luetic origin which have been cured by the antisyphilitic agents. The majority of cases of exophthalmic goitre are probably caused by nervous perturbations, especially in subjects predisposed by neurotic inheritances. Pregnancy and childbirth also have a causative influence, to be followed, however, by diminished function of the thyroid gland after parturition. An intermittent hyperthyroidism of minor degree is that occurring in adolescent girls. It is claimed that this type may occur without alteration in size of the gland, and these cases usually yield to appropriate measures if the condition is recognized sufficiently early; otherwise, severe toxic symptoms may supervene and persist. In exophthalmic goitre the degree of enlargement is moderate as a rule, and the right lobe usually more swollen than the left. The "swirling" murmur audible on auscultating the thyroid is highly characteristic when present, though it may be absent. In my experience, tenderness, emphasized by Kocher as a finding in this disease, is not invariably present. Exophthalmos, sometimes a late appearing symptom, is a prominent feature, although subject to variations. Among other ocular characteristics are Von Graefe's, Stellwag's and the Kocher-Boston signs. These signs, however, are more or less inconstant, although Von Graefe's is usually present. Muscular tremors, involving especially the hands, are almost constantly present and of much value for diagnosis. The characteristic features of neurasthenia appear in classical cases. Kocher has claimed that leucopenia is an early and important sign, though my own experience confirms this in certain cases only. In my complete clinical records of 33 private cases of which 27 were females and 6 males, 7 gave a previous history of tonsillitis and 6 of rheumatism. In one instance goitre developed immediately after an attack of acute tonsillitis and in two during acute rheumatism. One case was distinctly associated

with chlorosis. This disease, assigned as a leading cause of hyperthyroidism, in my experience is of little etiologic importance. The family histories of my cases revealed goitre in three cases only. The results of treatment so far as can be learned are: Cured, 11 (3 as a result of operation); improved, 12; unimproved, 2; died, 1. It is a reproach to our profession that earlier diagnosis of goitre is not made than is at present the rule. In my opinion, the administration of iodine or thyroid extract in dubious cases, with a view to developing the symptoms, if the case be one of incipient Basedow's disease, is quite justifiable. It is a common experience among internists that rudimentary cases often yield to well directed medical treatment. Those, however, which have reached a marked degree rarely respond to any form of treatment other than surgical. The combined presence of fine muscular tremor of the hands and persistent tachycardia justify a tentative diagnosis of this disease. Not uncommonly exophthalmos, or thyroid enlargement, or both develop, confirming the diagnosis. Persistent tachycardia with marked nervousness should always arouse a strong suspicion of this disease, and the same is true of tachycardia associated with the Boston-Kocher sign. Heart hurry may be the only feature present, to be followed, soon or late, by the other characteristic symptoms of hyperthyroidism. The condition is frequently overlooked because neither exophthalmos nor thyroid enlargement has appeared. These two cardinal features, often late in development, are not uncommonly absent temporarily in fully developed cases of the affection. Rarely either or both of these signs may be permanently absent. From the standpoints of treatment and diagnosis an attempt should be made to distinguish the hypothyroid from the more common hyperthyroid form of goitre. In the former the gland may be slightly enlarged; is soft but not tender; there is no expansile pulsation to palpation, and no "swirling" murmur audible. In this type the body temperature is slightly subnormal, the hands and feet liable to be cold, with marked sweating on slight exertion. Bradycardia is the rule in hypothyroidism, the pulse rate dropping as low as 40 per minute. In these cases the use of iodine and thyroid extract is required,—remedies which invariably tend to aggravate the symptoms of Graves's disease. Hyperthyroidism may merge into a myxedematous condition, and it is important to note the development of the signs of atrophy or loss of thyroid function when they supervene. Not only are some of the classical symptoms often missing in hyperthyroidism, but it is also found that degrees of thyrotoxicosis varying from slight evidences of overfunctioning of the gland to the most profound signs of Basedow's disease, as shown by basal metabolic studies, occur.

The Heart in Exophthalmic Goitre.—Dr. H. A. HARE: Goitre in the sense of simple enlargement of the thyroid gland is almost symptomless, except from pressure symptoms when the growth is exceedingly large. It is of the utmost importance to separate true goitre from the exophthalmic form, and we should practically make a third classification

of thyroid disease which might be called the hypothyroid class, because in these instances the gland, although it becomes greatly enlarged, does so, without the development of symptoms indicating parenchymatous change. That is, we meet with considerable enlargement of the thyroid gland in which there is probably some degeneration of its secreting substance and we have hypothyroidism, although hyperthyroidism, in the sense of the enlargement of the gland, is present. In other words, we have one type of great enlargement of the thyroid gland which is symptomless, except from pressure. We have enlargement so small that it is easily overlooked and yet in which there is so much secretion as to produce symptoms of hyperthyroidism. We have also enlargements of the thyroid gland associated with lack of secretion, hypothyroidism, which class very frequently is overlooked.

In regard to the hyperthyroidism or cases in which there is excessive secretion, so far as the heart is concerned I am surprised to find that, in a considerable proportion, in addition to the tachycardia, we do not have relaxation of the vascular system. An exceedingly rapid pulse is often found with a very high tension, that is, a pressure of from 160 to 180. I was asked to discuss the action of the heart in exophthalmic goitre, but felt that I ought to decline, because I knew so little about it.

To the three types of hyperthyroidism should be added a fourth in which there is enlargement of the gland with excessive secretion, but in which the interlocking directorate of the other parts of the body compensates. This is seen in pregnancy.

In treatment, the rest cure is invariably applicable in the presence of much tachycardia. There is little use in trying to treat an exophthalmic goitre patient who lacks the means of a real rest cure. Therefore, I believe that this type of case should be sent to the surgeon earlier than the patient who can afford one. Concerning the action of drugs, I have had little results from digitalis. So far as the pulse is concerned, my best results have been obtained from veratrum viride in 8 to 10 minim doses of the tincture five to six times a day. I am not, however, able to give a scientific explanation for the results secured.

The Nonsurgical Treatment of Goitre and its Complication.—Dr. CHARLES E. DE M. SAJOURS urged that simple goiter should be regarded, in the light of modern knowledge as an expression of a defensive reaction of the thyroid apparatus fifteen years ago, against one or more poisons, of endogenous or exogenous origin, which fact he had pointed out fifteen years ago. The pathogenic agent could be either ingested with water in the form of a lime salt, fecal bacteria, etc., or from various organisms or toxins originating from the tonsils, dental abscesses, sinus or nasal disease, impacted or retained feces, etc. By penetrating the blood, one or more of these poisons could awaken the defensive reaction of the organ. Where the latter was physiologically normal, it did not become enlarged, but when either through heredity, local lesions due to diseases of childhood, etc., its efficiency as a protective structure was reduced to the bare needs of nor-

mal catabolic functions, any one of these numerous toxins placed what remains of normal glandular tissue under severe stress, with congestion leading to hyperplasia as a main result. If the tissues involved in this hyperplasia, i. e., those remaining in excess of the fibrous or other functionless tissue, are able to carry on the defensive function, no symptoms of hyperthyroidism appear and the condition remains one of pure goitre without systemic disturbance, but, if the proportion of hyperplastic tissue exceeds this limit, the secretory activity of the gland is correspondingly increased and symptoms of hyperthyroidism appear, with Graves's disease as an advanced phase. The treatment resolves itself into removing the cause. In true goitre, where pressure symptoms are present or sclerotic changes prevent reduction of the mass, surgical measures may become necessary; but where the growth is purely hyperplastic, elimination of the causative toxin, whether this be tonsillar, peridental, intestinal, water borne, etc., with thyroid gland to aid the antitoxic process and relieve the gland of excessive work, excellent results may be obtained. In Graves's disease with the same line of treatment combined with vasoconstrictors and rest, cure may be obtained in all but a very small proportion of cases. Dr. Sajous insisted that surgery is resorted to with unwarranted frequency in such cases.

The Constitutional Disturbance of Toxic Goitre as Influenced by Surgical Therapy.—Dr. CHARLES H. FRAZIER: The present status of the surgical therapy of toxic goitre is but a stepping stone in the development of a method of arresting the toxic functional disturbances of the gland. The toxic goitre is brought to our attention in increasing numbers yearly. My experience with the surgical treatment of goitre comprises 268 cases, 185 of which have been of the toxic variety. There have been 237 operations, including 147 lobectomies and forty ligations. Four groups of toxic goitre include: 1, the adolescent type, in which the hypertrophy is so compensatory that evidences of intoxication are trivial and operation is deferred. Later, however, this type may become extremely toxic, and in young girls from sixteen to nineteen years of age presents the gravest form encountered; 2, a group met with between the ages of thirty and forty in which the patient has had an adenoma for years and which has been transformed into a toxic state. The prognosis of surgical therapy here is favorable; 3, a group in which the cases are toxic from the beginning, presenting the picture of exophthalmic goitre; 4, a group including any of the toxic varieties of comparatively long duration. Permanent relief here is not to be expected. Two groups of cases to be carefully analyzed before operation is sanctioned are represented by 1, the patient, a woman with a small adenoma and a group of nervous phenomena; 2, the patient in which the condition is characterized chiefly by tachycardia and but slight enlargement of one lobe. In the first group, upon the two or three occasions when I have been overpersuaded to operate, the outcome has not been gratifying; in the second group, in my experience, operation has been beneficial in about half of the cases. As a result of the observation by Means, DuBois and others, it

has been demonstrated that the rise in basal metabolism indicates the degree of toxicity of the thyroid gland, and I am employing this test not only to determine the degree of toxicity as an index of the operative risk and as a guide to treatment, but as a means of determining the ultimate effects of the operation. In our investigations of the thyroid I emphasize the possible relationship of the thymus gland. Clinically, some extraordinary results have been reported following a partial thymectomy in hyperthyroidism. In the cases of mildly toxic goitre there are no contraindications to an immediate lobectomy without preliminary ligation. While operation cannot be said to be imperative there is a substantial basis for early operative interference.

In the graver forms of toxic goitre the cases are all hazardous. In the earlier stages of the disease a lobectomy may be justified occasionally as the initial step of treatment; in cases of longer duration, under no circumstances should more than a ligation be attempted. In my clinic our usual time for doing the lobectomy is two months after the ligation. The mortality in my series of operations upon toxic goitres has been 3.5 per cent. I find that of the constitutional disturbances operation is most marked in its effect upon the nervous phenomena, next, upon the nutritional disturbance. Upon the circulatory disturbance the effect of the operation depends largely on the condition of the heart at the time of the surgical treatment, tachycardia being the most persistent symptom. Concerning the amount of tissue removed, my inclination has been to increase the extent of the resection so that not more than one sixth of the total amount is conserved. Using the term "cure" in the sense of restoring the patient to a state of health permitting the resumption of customary duties, although moderate tachycardia and nervous disorder may be present, we record seventy per cent. of recoveries. For the satisfactory end results of operation the surgeon is dependent upon the cooperation of the family physician.

Letters to the Editors.

AN INJUSTICE TO THE PROFESSION.

NEW YORK, March 18, 1908

To the Editors:

The press announces "fifty medical men dropped each week" for inefficiency, some for incompatibility, and draws special attention to the disgraceful episode recited in the chamber by Senator Chamberlain, where the father found the body of his son lying on the floor.

This article is very unjust to the medical profession who gave up every worldly consideration and rushed to the colors at the first call. That many are temperamentally unfit is undeniable, that some are incompetent is true, but the great body of medical men in the United States Army is all right. If there be fault, and there is lots of it, it lays at the door of the Army. There is too much Soldier and not enough Doctor. The three months' training at the medical camps was spent in infantry work, paper work, elucidation of red tape and no medico-military study. The enlisted men in the Medical Corps were taught the same instead of nursing. Both of these, the medical officers and enlisted men, graduated as good soldiers, full of red tape and paper work, and were sent to the various military camps. Sympathy for the sick, the greatest attribute of the medical profession, was blunted. The enlisted man by

virtue of a maroon hat cord became a nurse. Hence the disgraceful things so vividly pictured by Senator Chamberlain. Can any one imagine a physician striking a patient for disobeying orders! Yet that is what a medical officer is accused of doing.

Just think of the ridiculousness of having sick call at a stated period and allowing the sick to wait till the next day's call if they are taken ill between times, yet that is what happens and is happening every day. The doctor is a soldier and the particular hour must be observed. The Hospital Corps non-coms and privates take their cue from their superiors. The non-coms often do the prescribing and C. C. pills are swift, safe, and efficacious. The soldier is a malingerer and a faker anyway, so one C. C. pill for the first visit, two pills for the second, and if the soldier survives and returns, he is really sick and ready to be seen by the surgeon.

Get the doctor out of the army. Get them in a corps of their own, independent of the army. General Gorgas, the great sanitarian and medical man, the man who made the building of Panama possible, was disregarded when he advised the building of hospitals prior to the building of cantonments. Why? Because he was the junior in the conclave of the Army Staff. The trained soldier obeyed the dictation of the staff and cantonments were built first and the medical scandal resulted. A great physician not bound by discipline could insist on his point, could enlist the assistance of the public and the Secretary of War, the President himself, but the Surgeon General must obey orders, now two Army surgeons will be discharged from the service, a stigma on their names, dishonored victims of a vicious system.

A sanitary officer obeying the medical officer in charge of a military sanitarium caused repairs to be made. The bills were approved by the Surgeon General but disapproved by the Quartermaster General. The sanitary officer is stuck for \$1,300.

Efficiency boards convened to try medical officers are composed of line officers.

Away with red tape where human lives are concerned. Our people who gladly give themselves and their sons to help win this war are, as far as medical attention is concerned, entitled to the same treatment as the civilian populace. Give the soldier good doctors, sympathetic, friendly, humane.

SUBSCRIBER.

Book Reviews.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

The Immediate Care of the Injured. By ALBERT S. MORROW, A.B., M.D., Clinical Professor of Surgery in the New York Polyclinic; Attending Surgeon to the Workhouse Hospital and to the Central and Neurological Hospital; Major, Medical Department, Officers' Reserve Corps of U. S. Army. Third Edition, Thoroughly Revised. Philadelphia and London: W. B. Saunders Company, 1917. Pp. 356. (Price \$2.75.)

The object of Doctor Morrow in writing this work is expressed in the preface. The book is not intended to supplant the physician or surgeon, but is designed solely as a guide in emergencies until the arrival of medical aid or when such aid cannot be procured. However, as it is intended for the instruction of the layman and as such a subject cannot be presented intelligently to those who possess no medical or surgical knowledge, and indeed would be useless unless some elementary essential anatomical and physiological facts were given, in Part I the anatomy and physiology of the human body is briefly outlined. As this book is in its third edition, it will be unnecessary to discuss it at any length. The present edition has been carefully revised and brought up to date, some of it rewritten for this purpose. Parts I and II have been somewhat condensed, while some new material has been incorporated in Part III. The book is written in clear language, adequately illustrated, and may be strongly recommended as a means of providing useful instruction in first aid principles and practice.

Diseases of the Digestive Organs. With Special Reference to Their Diagnosis and Treatment. By CHARLES D. AARON, Sc. D., M. D., Professor of Gastroenterology in the Detroit College of Medicine and Surgery; Consulting Gastroenterologist to Harper Hospital. Second Edition, Thoroughly Revised. Illustrated with 156 Engravings, forty-eight Röntgenograms and nine Colored Plates. Philadelphia and New York: Lea & Febiger, 1918. Pp. xlvii-818. (Price \$7.)

The demand for a new edition of this work has afforded the author an opportunity to revise it carefully and to add several chapters. One of these describes the examination of the duodenal contents, the employment of the duodenal tube, for lavage, and the method for removing the contents at will. Another chapter deals with the medical and surgical treatment of chronic intestinal toxemia and chronic intestinal stasis. A third chapter treats of flatulence, meteorism, and tympanites. He has tested new methods of diagnosis and treatment to determine their value, and a generous clinical experience has enabled him to prepare a work that is a very practical and useful guide to the general practitioner.

Clinical Lectures on Infant Feeding. Boston Methods. By LEWIS WEBB HILL, M.D., Junior Assistant Visiting Physician, Children's Hospital, Boston; Alumni Assistant in Pediatrics, Harvard Medical School. Chicago Methods. By JESSE ROBERT GERSTLEY, M.D., Instructor in Pediatrics, Northwestern University Medical School; Associate Attending Pediatrician, Michael Reese Hospital, Chicago. Philadelphia and London: W. B. Saunders Company, 1917. Pp. 377. (Price \$2.75.)

This series of lectures by Doctor Hill and Doctor Gerstley demonstrates the manner in which the feeding of infants is carried on in Boston and in Chicago. Both cities for long have had a high reputation for their infant feeding methods, and in many respects may be said to lead in this field. However, the methods are dissimilar, and for purposes of comparison a study of the book cannot fail to be instructive. As a matter of fact, the work was published to provide a novel means of postgraduate study. The following plan was suggested by Dr. W. S. Rankin, secretary of the Board of Health of North Carolina. He conceived the idea that a traveling lecturer should come to the door of the physician, thus enabling him to receive postgraduate instruction without having to leave his practice for several months of the year. President G. K. Graham, of the University of North Carolina, heartily endorsed the scheme and together with the board of health afforded every facility for carrying it out in North Carolina. The book is, in its way, unique and eminently useful to pediatricists.

Los fenómenos biológicos ante la filosofía. Por el Dr. NICOLAS RODRIGUEZ Y ABAYTUA, Académico numerario, de la Real de Medicina. Madrid: Imprenta y Librería de Nicolas Moya, 1918. Pp. 251. (Precio, 5 pesetas.)

As Doctor Abaytua says in his foreword, he does not attempt to give a pretentious systematization of the facts of biological phenomena, which must always be more or less arbitrary, but merely puts forth in progressive order the subjects he has studied for four decades. Thus, instead of chapters, he uses units of a paragraph to five pages in length, each headed by a marginal synopsis. He leads the reader in an easy, intimate way through a wide range of material such as science; language; phenomena; mental pictures; sensations; judgment; optical illusions; the structure of the body from cosmic ether and electron to tissue and organ; digestion; rations; metabolism; nature of diastases; catalysis; cellular irritability, and energy. Philosophy, he maintains, is not a capricious creation of visionary ideas distinct from science, but an amplification and advance upon the latter, an attempt to make reality understandable. Even those scientists who affect to despise philosophy are inconsistent enough to accept hypotheses based on nonexistent elements such as heredity. Too much emphasis in medicine has been put upon laboratory science to the neglect of the methodical observation of the sick. Scientific philosophy over the why and how of natural phenomena is the foundation of medical practice. Life is superior to mere physics and chemistry for it

keeps to its form even though its material be completely renewed. Following are some opinions that strike one's attention. He disapproves of the antiseptic treatment even of infected wounds, for it destroys the cells as well as the infecting agents. In infectious diseases the pathogenic action of microbes is far subordinate to the personal predisposition, the defensive reaction of the subject, and the apparent tirelessness of nerve fibres in experiments may be attributable to the fact that the surrounding tissues are more or less separated from them, giving increased access to oxygen. The book leaves an impression of sincerity and openminded striving after the truth.

The Conduction of the Nervous Impulse. By KEITH LUCAS, Sc. D., F. R. S., Fellow and Lecturer of the Trinity College, Cambridge. Revised by E. D. ADRIAN, M. B., M. R. C. P., Fellow of Trinity College, Cambridge. With diagrams. New York and London: Longmans, Green & Co., 1917. Pp. xi-102. (Price \$1.50.)

This excellent series of monographs on physiology, with Starling as editor, includes one on the conduction of the nervous impulse. Owing to the untimely death of Keith Lucas in the aviation corps, the work did not receive the final review of its author. Therefore, undoubtedly it is not as complete as it would have been had he been able to finish it. He approaches the subject from the biological and physiological point of view of muscle nerve correlation. He practically adopts the contention that nerve is developed more or less from muscle. From this approach a study of the conduction of the nerve impulse can be most successfully carried out. He outlines a number of experiments along these lines showing the effect of various conditions upon conduction, such as narcotization, freezing, and heating, giving rich bibliographical references where his work impinges upon that of science. Not much is said bearing on the physicochemical changes in the synapse, which undoubtedly would have been done had he been able to finish his work. In general he believes that peripheral and central conduction are identical, but that central conduction by reason of the complexity of the central nervous system cannot be advantageously studied. It is better, therefore, to keep to the more elementary peripheral structures and to base deductions upon such studies as are here presented.

Elements of Hygiene and Public Health. A Textbook for Students and Practitioners of Medicine. By CHARLES PORTER, D. D., B. Sc., M. R. C. P. (Edin.), of the Middle Temple, Barrister-at-Law, Medical Officer of Health, Metropolitan Borough of St. Marylebon; Examiner in Public Health, University of Edinburgh; Member of Board of Examiners, Royal Sanitary Institute and Sanitary Inspectors' Examination Board, etc. With 98 illustrations. New York: Oxford University Press, 1917. (Price \$4.75.)

Doctor Porter is an authority on sanitation and hygiene and a writer of note on these subjects. It is peculiarly fitting that he should write a work intended mainly for the instruction of the medical practitioner. Undoubtedly preventive medicine is the medicine of the future and it would seem to behoove the medical man to possess a fairly definite and comprehensive knowledge of sanitation and hygiene. In the work the information is up to date and practically covers the entire ground. The book is adequately illustrated and in all respects is excellent.

Les lésions du corps thyroïde dans la maladie de Basedow. Par GUSTAVE ROUSSY, professeur agrégé à la faculté de médecine de Paris, médecin en chef de l'hospice de Villemin. XXIVe Congrès des médecins aliénistes et neurologistes de France et des pays de langue française. Session du Luxembourg, août, 1914. Paris: Masson et Cie, 1914. Pp. 135.

At the Luxembourg session of the Twenty-fourth Congress of Alienists and Neurologists of France held in August, 1914, Dr. Gustave Roussy presented an extensive report on the pathological alterations in the thyroid in exophthalmic goitre. This report has been published as a monograph and is entitled to careful study. Notwithstanding the enormous amount of work on the evolution of the disorder which is termed exophthalmic goitre, no one has arrived at an energetic conception. It is known

that gross alterations such as those result from syphilitic or carcinomatous diseases produce changes in the thyroid which bring about a grave modification of its function, which clinically are termed myxedema or various forms of hyperthyroidism, but it is not to these types of lesions that Roussy devotes his attention. This small monograph attempts to go out into a wider investigation of changes in other organs of the body, which occur with increased frequency because of a functional disturbance in the thyroid. These he has discussed under the title of inconstant and accessory lesions, the heart, lungs, gastrointestinal canal, liver pancreas, kidneys, gonads, and suprarenals being studied particularly. He then gives considerable attention to changes in the thyroid itself. These changes are copiously illustrated. In general it may be said that Roussy inclines to the general idea that exophthalmic goitre is primarily a disease of the thyroid gland, but it also invariably implicates the activities of the thymus, and that there is other than compensatory or accessory involvement of this latter structure. The importance of the vegetative nervous system is partially appreciated by him, although it cannot be said as yet that a genetic conception has been attained. In other words, the main question as to what stimulates the hormone has not yet been answered. The study is an excellent descriptive one, however, and entitled to consideration from this point of view.

As a Corner of the Principal Works of the Atreya School of Medicine with Their Chronology. By KAVIRAJ BIRAJA CHARAN GUPTA KAVIBUSHANA, Late Court Physician of Cooch Behar, etc. Calcutta: P. S. Gupta, 1917. Pp. 66.

Hindu medicine has little but historical interest to entitle it to be called to the attention of present day readers. Practical matters of serious import crowd upon the attention of the modern physician, leaving but little leisure for historical or other types of interests. To one, however, who would like to obtain a brief glance at what the author calls Hindu sages, this small booklet will prove of interest. It contains a readable and interesting account of some of the ancient Hindu works. Much of the information is taken from Hoernle.

Births, Marriages, and Deaths.

Died.

ALEXANDER.—In Washington, D. C., on Thursday, February 28th, Dr. Charles T. Alexander, brigadier general, U. S. Army, retired, aged sixty-five years.

BICKFORD.—In New York, N. Y., on Saturday, March 9th, Dr. Lydia A. Bickford, aged sixty-nine years.

EWING.—In Baltimore, Md., on Friday, March 1st, Dr. Charles B. Ewing, major, U. S. Army, retired, aged sixty years.

GREENLAW.—In Artesia, N. M., on Wednesday, February 27th, Dr. Joseph O. Greenlaw, aged forty-four years.

HIRSH.—In Baltimore, Md., on Sunday, March 17th, Dr. Jose L. Hirsh, aged forty-six years.

HOWARD.—In Boston, Mass., on Monday, March 11th, Dr. William Lee Howard, of Westboro, aged fifty-seven years.

MEAD.—In Bloomfield, N. J., on Sunday, March 17th, Dr. Sarah R. Mead, aged seventy-one years.

MULLEN.—In Lynn, Mass., on Thursday, February 21st, Dr. John Henry Mullen, aged forty-one years.

NORSTEDT.—In Camp Upton, N. Y., on Saturday, March 16th, Dr. Gustaf L. Norstedt, lieutenant, Medical Reserve Corps, U. S. Army, aged twenty-six years.

PERSONS.—In Columbus, Ga., on Sunday, March 3d, Dr. Remus C. Persons, medical director, U. S. Navy, retired, aged sixty-eight years.

READ.—In Richmond, Va., on Tuesday, February 26th, Dr. Frank Marshall Read, aged fifty-five years.

SOUTHMAYD.—In Brooklyn, N. Y., on Tuesday, March 12th, Dr. John Franklin Southmayd, aged fifty years.

TOWNSEND.—In Quitman, Mo., on Tuesday, February 26th, Dr. Alfred M. Townsend.

WAGNER.—In New York, N. Y., on Sunday, March 17th, Dr. William E. Wagner, aged forty years.

WOOD.—In Attalla, Ala., on Thursday, February 28th, Dr. James H. Wood, aged sixty-one years.

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HAY FEVER AND ASTHMA.*

The Uses and Limitations of Desensitization.

BY ROBERT ANDERSON COOKE, M. D.,

New York,

Associate Attending Physician, Post Graduate Medical School and Hospital.

Any discussion of the clinical conditions known generally as hay fever and bronchial asthma must take into account the present day view that they are anaphylactic reactions to a certain extent at least. It is my object to present the results of the analysis of a series of these cases in the hope that it may furnish a more definite viewpoint, first, as to the extent to which anaphylaxis plays an etiological part, second, as to the results that accrue to the patient from observations so made and, finally, as to the indications for and limitations of treatment by desensitization. The comparative newness of the subject readily accounts for a distinct uncertainty on many points that can only be clarified by careful observations over a much longer period of time.

If we bear in mind the important fact that the reaction of the human body to inanimate forms of protein is fundamentally the same as that toward animate forms, namely bacteria, it ceases to be a source of wonder that clinical reactions to inanimate proteins, such as foods and pollens, occur to the extent that they do. In a former publication, on the basis of over records of 200 cases taken at random, it was estimated that protein sensitization with clinical manifestations probably does not exceed ten per cent.

In a study of the history of infectious diseases, especially certain prevalent infections of the human race over centuries, it has long been established that a slow but definite relative immunity is developed. This is instanced by the ravages of syphilis in Europe after its first introduction in the fifteenth century in contrast with its effect upon the American Indian at that time and the relatively slow progress in the infected individual today; by the high mortality to measles among the Fiji Indians during their first epidemic; by the fact that the human race is gradually protecting itself in the same way against the onslaught of tuberculosis; and by the fact that about fifty per cent. of all normal adult human individuals carry

a natural antitoxin to diphtheria. This relative immunity against infections seems in some cases at least to be due to an inherited sensitization. Exactly the same condition of bacterial sensitization obtains in individuals whom we protect prophylactically against typhoid; their condition is ultimately one of sensitization only, and the relative immunity they enjoy is due solely to the fact that their body cells have the capacity to react in a very short time to an invasion by the typhoid bacillus and the protecting antibodies overcome the organism before it has reproduced itself sufficiently to produce the disease. It must be borne in mind that the immunity obtained by the prophylactic inoculation is only relative. An individual might well be immune against the few organisms ingested from a glass of water or milk, whereas he would readily succumb to the infection were a sufficient number of the germs introduced directly into the bloodstream.

The object of this discussion of infectious disease is merely to emphasize the fundamental identity of the body reaction to proteins, whether they be bacterial proteins, toxins, or inanimate proteins, and, further, the fact that whereas this sensitization of body cells is distinctly advantageous and protective against the incidental invasion of bacteria, it is a definite cause of disease and absolutely disadvantageous to the human economy when this same capacity for sensitization of cells has spread to those forms of inanimate proteins which constitute our daily food or with which we must come in intimate contact.

Principles of sensitization.—I will discuss briefly the principles of sensitization in general. In 1898 Richet published an article with regard to hypersensitiveness to toxins and he coined the word anaphylaxis to denote this condition. In 1903 Theobald Smith remarked upon the condition which is now known as the Theobald Smith phenomenon in which a hypersensitiveness was created to proteins in themselves not toxic. This phenomenon was studied by Otto in Ehrlich's laboratory and by Rosenau and Anderson in this country and their work will always be of fundamental importance in the study of the subject of sensitization. From these studies, and from the later studies of Coca, von Pirquet, Dale, Mannering, Pearce, Weil, and others, the following facts have been established: 1. The injection of

*Read before the New York Academy of Medicine, January 17, 1918.

any protein into an animal stimulates the body cells of that animal to produce specific reacting substances called antibodies. 2. An incubation period is required for the formation of antibodies against these proteins in exactly the same way that an incubation period is required in an infectious disease. 3. The production of antibodies bears a definite relation to the amount of protein injected and the number of times that the injections occur; in other words, the larger the amount of protein and the more the number of injections the greater is the amount of antibody produced. These antibodies tend to attach themselves to certain cells within the body and also to circulate free. When antibodies are present in small amount, they are for the most part attached to cells. When an overproduction of antibodies has been stimulated, they exist in both forms, attached and free. 4. On introduction of specific protein into a sensitized animal, a reaction occurs and this reaction takes place in the sensitized cells. 5. Sensitization and immunity are in principle identical. When antibodies are few and attached, we have the sensitized state; when they are in excess and circulate freely in the blood we have the immune state. Immunity, however, is only relative and depends on the number of free antibodies present. We can well imagine an animal having a sufficient number of free antibodies to protect him against a small dose of the specific protein, whereas ten times this dose would give rise to symptoms. In other words, immunity is only a relative state and relative in that it depends not only on the amount of the intoxicating protein that is introduced, but on the manner of its introduction; by this I mean that an animal might be immune to a subcutaneous injection, whereas the same amount of protein intravenously introduced would cause death. 6. Immunity produced experimentally and due to the free circulating antibodies is only a temporary state and in the absence of repeated stimulation by specific injections the body will return to the sensitized state, and the free antibodies practically disappear from the blood. 7. Desensitization is produced in a previously sensitized animal by the sublethal injection of its antigenic protein. It is partial or complete depending upon whether some or all of the attached antibodies are combined with the injected protein. When desensitization has once occurred, the specific protein can then be introduced in any quantity whatsoever without symptoms because there are no free antibodies left with which it can react. An animal that has been sensitized is free of symptoms when its specific protein is injected under two conditions: when it is immune and when it is desensitized.

Artificial vs. natural sensitization.—These principles of sensitization, as discovered experimentally, have been of the utmost importance in an understanding of the natural sensitization that occurs in the human individual. So far as the human is concerned, it is possible to sensitize him artificially in the same way that the lower animals are sensitized. This artificial sensitization, however, never reaches the degree of exquisiteness that is discovered in those naturally sensitized.

Again, as shown in a former publication, artificial sensitization is not permanent, and does not seem to give rise to clinical manifestations. When we bear in mind that the anaphylactic reaction is cellular in character, we can well understand that in the naturally sensitized individual a wide clinical reaction that ensues upon the introduction of the specific protein will depend entirely upon the group of cells that happen to be sensitized, and it is for this reason that we see such a miscellaneous and apparently irrelevant group of symptoms described as being anaphylactic in nature.

When the sensitized cells are those of the mucous membrane of the eye and upper respiratory tract, the reaction that occurs is typical of hay fever, and when due to pollen, is hay fever. If the sensitized cells are those of the mucous membrane or smooth muscle fibre of the bronchi, then the reaction gives rise to that group of clinical manifestations designated as bronchial asthma. By the same token, when the sensitized cells of the skin are subjected to the specific antigen we have urticaria. If the sensitized cells are those of the subcutaneous connective tissue, angioneurotic edema results. When the sensitized cells lie in the mucous membrane and the smooth muscle fibre of the intestine, the reaction gives rise to acute or, in less severe cases, subacute or chronic symptoms of gastroenteritis.

On account of the fact that the field is so new, we feel tempted, and rightly I believe, to apply this principle to many of the undetermined ailments of the present day, such as migraine, epilepsy, arthritis, renal or hepatic disease, and even to some of the blood dyscrasias because we see certain of these manifestations in experimental work. For example, it is not uncommon after a large therapeutic injection of horse serum for acute multiple arthritis to develop. In experimental work on dogs the sensitization that occurs is largely in the hepatic cells where cloudy swelling and in prolonged cases necrosis follows the reaction. In animals also we note a markedly delayed coagulation of the blood following an anaphylactic reaction. I believe, therefore, that we are right in investigating many types of human ills along these lines, always being careful, however, to maintain an unbiased and unprejudiced point of view in the interpretation of any facts elicited.

Pathogenesis.—Little is positively known as to the pathogenesis of sensitization. In a former publication, written with Dr. Vander Veer, we were able to show certain facts regarding the importance of inheritance: 1. Fifty per cent. of sensitized individuals have a positive family history, whereas only fourteen per cent. of a group of normal individuals give such a history. 2. The age of onset of the clinical symptoms is earlier in cases with a positive family history, the earliness of onset bearing a direct relation to the completeness of the family history. 3. The clinical manifestation of this sensitization in the descendant bears no relation whatever to that of the antecedent. In other words, sensitized individuals transmit, not a specific sensitization but, as we have expressed it, an unusual capacity for developing bioplastic activity to any for-

increasing the interest is thus carried so far as it is possible to dis-
covery of tenacity, the possibility of sensitiza-
tion of transmitted as a dominant characteristic in the Mendelian sense of the word. Aside from this inheritance factor, we must consider whether humans who have inherited this abnormal characteristic develop their own sensitization by the usual immunological process, that is, by the absorption of unaltered protein through some channel, or whether the sensitization is acquired in the absence of antigen. I will mention this subject more in detail in a discussion of the subject of pathogenesis of hay fever and asthma, but will say here that the arguments are strongly for an interpretation in favor of the latter of these two ways.

Multiple sensitization.—The peculiar capacity of individuals to develop reacting bodies within themselves is shown most strikingly by the fact that over forty-two per cent. of a large series of cases showed a reaction to many unrelated forms of protein. These different sensitizations, amounting to as many as fifty in some cases, show absolutely no relation to one another. An individual, for example, afflicted with early hay fever, late hay fever, and an animal asthma, can be protected only by the injection of each specific protein. In other words, the pollens for early hay fever protect only against early hay fever, and the pollens for late hay fever protect only against the late type, the animal reactions being affected only by treatment with the specific preparation. This multiple sensitization creates in some cases a very difficult problem in nutrition when the sensitization involves many of the more important foods.

Diagnosis of sensitization.—The clinical diagnosis of a sensitization depends upon the production of a reaction. These reactions are elicited upon the presentation of a suspected protein to the sensitized cell. We must here bear in mind the important fact that the sensitized cells are much more widely distributed than that particular group giving a clinical reaction. In hay fever, for instance, it is not so surprising that the cells of the mucous membrane of the upper respiratory tract and the eye should give a specific reaction. It is much more surprising, but still it is a fact, that all of the epithelial cells are sensitive as well and this holds not only for hay fever and other forms of protein rhinitis, but for most all of the clinical forms of anaphylactic reaction that occur.

There are some exceptions to this general rule. In a few recently developed cases of hay fever, the cutaneous reaction is very slight or nil when an ophthalmic or nasal reaction is obtainable. There are other instances among our cases, one of a definite but mild sensitization to clam protein, shown by the clinical symptoms always following the ingestion, in which no cutaneous reaction was obtainable. On the other hand, Longcope has made note of the fact, and we can support the observation, that individuals react cutaneously to certain proteins which apparently give rise to no clinical manifestations. This is a very important point in the interpretation of our tests for therapeutic purposes. The explanation for the absence of clinical symptoms is clear. An individual may give a cutaneous reaction to beef protein and the absence of symptoms is due to the

fact that this sensitization does not occur in the intestinal epithelia and, in the normal process of digestion the unaltered beef protein does not filter through and therefore never comes in contact with the sensitized cells, hence the absence of symptoms. In view of the fact that in the vast majority of cases the sensitization is not limited to any particular group of cells, but seems to affect all of the epiblastic tissue in general, it is possible to make diagnostic use of this reaction and we have recourse, therefore, to the intradermal and to the ophthalmic reactions.

The intradermal test can be carried out by rubbing the protein through the unaltered skin, rubbing it through a scratch or abrasion, or by inserting the protein into the layers of the dermis by means of a fine hypodermic needle. Of these different methods I believe preference should be given to the intradermal injection by hypodermic syringe because it creates less trauma and the protein is brought into more intimate contact with the sensitized cells. As far as volume is concerned, approximately 0.01 c. c. is injected. This produces a small papule two or three millimetres in diameter and concentration will depend upon the type of protein used, but irrespective of the type of protein an amount not exceeding 0.001 mgm. of nitrogen is entirely safe. A markedly positive reaction is denoted by an almost immediate erythema surrounding the point of injection. Gradually, a whitish urticarial wheal appears which spreads its pseudopodlike projections out into the hyperemic zone and in the course of from five to ten minutes the immediate reaction is well developed. The more moderate reactions develop more slowly, the wheal is rounded, the pseudopodlike projections are absent, and there is a distinct zone of hyperemia. Usually an observation for fifteen or twenty minutes will suffice to note all the immediate reactions.

In certain instances, however, a delayed reaction appears in from twelve to twenty-four hours. There is never any distinct wheal, but there is a definite zone of hyperemia around a central reddish papule. I am not prepared to state the importance of these delayed reactions. So far it has not seemed that they connote a clinical sensitization. It may be the beginning of a new sensitization which undoubtedly does arise in these cases from time to time, but up to the present there has been no opportunity to verify this suggestion.

The ophthalmic test is made by the instillation of a small amount of protein solution into the eye. In positive cases the reaction begins within fifteen minutes, is characterized by itching, lachrymation, and conjunctival and corneal infection. Where the solution has run through the nasal duct, irritation is set up in that side of the nose and produces sneezing, congestion, and nasal discharge. The severity of the reaction depends upon the degree of sensitization. This reaction is much more limited in its value than the intradermal reaction, for the reason that many of the food proteins which give clinical symptoms and a cutaneous reaction give no ophthalmic reaction. It is, however, of particular value in those cases in which the clinical manifestation is one of protein rhinitis and here we have used it to de-

termine the degree of sensitization for therapeutic purposes. Cases that require a high concentration of protein to produce a reaction are much less sensitive and require larger doses for therapeutic purposes.

HAY FEVER.

I feel that it is entirely within the scope of this paper to discuss under hay fever all those varieties that occur from any cause not infective in character. It seems wise here to protest against the use of the term "hay fever" as too restricted in meaning to fulfill all requirements and convey the conceptions of the condition rhinitis, as we understand it today. The use of the term "protein rhinitis" or "anaphylactic rhinitis" is now suggested to cover the entire group of disturbances due to pollens, animal emanations, perfumes, sachets, and foods. The more we study clinically cases of so called "vasomotor rhinitis" and the broader our experience becomes, the larger is the percentage of cases that are demonstrably anaphylactic. I do not wish to be misunderstood as assuming a too biased attitude or denying the existence of vasomotor changes, but I do believe that the same situation obtains here as in bronchial asthma, namely, that there is a development of a capacity in the mucous membrane to react by vasomotor changes to exciting causes other than those fundamentally responsible for the condition, the fundamental condition being anaphylactic in nature. Let me cite an illustrative case:

CASE.—A boy, age twelve years, in previous good health save for diseased tonsils and adenoids which had been removed, was observed one summer to be subject to short and violent spells of sneezing although his environment and activities were no different from those of previous summers. At first, after the attack, his nasal condition was normal. As the summer wore on the attacks of sneezing and obstruction were longer and the free interval correspondingly shortened. An apparent connection was then discovered between the attacks and his exposure to animals. With his return to school in the fall there was no further exposure to animals, but he nearly disrupted the discipline of the school by his violent sneezes when he inhaled the chalk dust at the blackboard. At the end of a month these attacks from mechanical irritation entirely subsided and he was apparently perfectly normal.

This case illustrates very nicely the interrelation of specific and nonspecific factors and also emphasizes the point to be made later in discussing treatment: that the removal of the underlying specific cause permitted the mucous membrane gradually to return to normal in spite of the continued mechanical irritation of the chalk dust.

Pathology and pathogenesis.—Apart from the inheritance factor which has been mentioned and which holds in these cases to the same extent that obtains in all sensitization cases, the importance of anatomical structure and of infections must be pointed out. It has not been possible from a study of our cases to prove that either structural narrowing of the nares or the presence of infection are factors in the pathogenesis of nasal sensitization, and it is my belief that they play no part whatsoever even in those predisposed by inheritance. In the individuals with anatomical or pathological defects, it appears that the structural narrowing or hypertrophied or congested mucous membrane merely aggravates the clinical symptoms due to the anaphylactic

reaction itself. As a matter of fact, it seems fairer to assume that hypertrophied and chronically congested mucous membrane is the result of either infection or protein reaction. Persistent protein cell action undoubtedly leads to infection and its attendant symptoms; there is no ground for believing that the reverse ever obtains.

Etiology.—The following is an attempt at an etiologic classification of rhinitis:

Etiologic Classification of Rhinitis, Acute or Chronic.

1. Infective.
2. Noninfective.
 - A. Vasomotor rhinitis.
 - B. Protein rhinitis: a. Pollens—hay fever, early and late.
 - b. Sachets.
 - c. Animal dander.
 - d. Foods.

Of the relative importance of the protein group there is no doubt, but the pollens stand first and foremost, while animals and sachets each constitute about ten per cent. of the cases. As to the importance of foods, I am scarcely prepared to make a statement other than to say that I have not yet found a case in which food alone was the cause of a simple rhinitis clinically like that caused by pollens and dander. All of the attacks of acute rhinitis from foods that have been observed were also associated with edemas of the mouth or pharynx, abdominal pain or vomiting, and general erythema or urticaria. In none of the subacute or chronic cases of uncomplicated rhinitis has a food appeared to be the essential cause. In other words, when food is a factor, gastrointestinal and cutaneous or asthmatic symptoms are also present and minimize or obscure the nasal symptoms.

Diagnosis.—That an accurate and complete diagnosis is essential to therapeutic success is axiomatic, whether that therapy be prophylactic or immunological. In all cases resort must be had to intradermal and ophthalmic tests. In cases with a history of seasonal attacks corresponding to hay fever the tests need be made with pollen extracts only. Where the history is irregular or complicated with bronchial, cutaneous, or gastrointestinal symptoms, it is often necessary to make the complete series of tests with pollens, sachets, danders, and foods, numbering in all about eighty. If violent reactions are carefully avoided, it is feasible to make fifteen or twenty cutaneous tests at one time. Ophthalmic tests to this extent are out of the question.

Treatment.—We must always bear in mind three factors: 1, the sensitization; 2, the condition of the nose, the presence of polypi, hypertrophy of turbinates, deviated septa, etc.; 3, infections of nasal and paranasal sinuses. First let us discuss the sensitizations in order. Hay fever treatment is carried out by the subcutaneous injection of minute amounts of the specifically reacting protein. It is best instituted six weeks before the usual onset of trouble, one injection a week of gradually increasing amounts. The injections are continued through the season, altogether about twelve being given. Phylactic treatment, that is, treatment instituted after symptoms have started, consists of the frequent injection of pollen extract every day for three or four doses, then every two or three days, and gradually

increasing the interval as the doses increase. The patient is thus carried through a season on an average of ten or twelve injections. The mechanism of the alleviating effect of this specific therapy is that of desensitization and not a true immunity. The freedom from symptoms is due to the combination of the introduced pollen substance with its specific antibodylike substances in the tissues and the freedom remains so long as this union remains. Unfortunately, this is not permanent; in fact the combination is so unstable that weekly injections are required. The use of the treatment in typical hay fever is evidenced by the fact that eighty per cent. of the cases are relieved of eighty per cent. of their symptoms.

There are, however, difficulties encountered in the administration of pollen extract, either from too large a desensitizing dose, in which case marked local or constitutional symptoms are developed; or from insufficient dosage, when the clinical manifestations are not adequately controlled. The degree of sensitization is determined by the concentration at which ophthalmic and cutaneous reactions occur. It is a fact that the higher the degree of sensitization, the smaller the desensitizing doses must be and the more satisfactory is the therapeutic result. By excessive local reaction is meant any reaction at the site of injection lasting over thirty-six hours with edema, erythema, and itching. Constitutional reactions are manifest in many ways: edema of face, especially eyes or other parts of the body, excessive paroxysmal cough, asthma, general urticaria, pruritis, gastrointestinal disturbance, and in one instance I observed a cardiac collapse with a very rapid and almost imperceptible pulse. Care in determining the degree of sensitization and experience are both invaluable in avoiding the danger inherent in this method of treatment.

Therapy in the second and third forms of sensitization, sachets, and animal dander can be considered together. They are much less frequent, but when sources of trouble they are much more annoying, for symptoms are apt to be continuous. In these cases diagnosis is the essential factor in success. There are no therapeutic indications in these cases in which the offending protein can be removed, and usually this can be done. For individuals unable or unwilling to alter their environment, desensitization can be carried out. Results are satisfactory but cannot be expected inside of a few weeks. The same dangers obtain here as for pollen desensitization and the desensitization is no more permanent than for pollens. It is possible, however, after twelve or fifteen injections have been given to prolong the interval between treatments to four to six weeks so that desensitization is maintained with no great personal inconvenience.

Finally as to food proteins, as was noted earlier in this paper, no case of simple, uncomplicated, acute or chronic rhinitis has yet been discovered as being due solely to food protein. It is safe to assert that it must be extremely rare and diagnostic tests with food proteins are only indicated in cases that cannot be diagnosed as belonging to one of the first three groups, and in those so diagnosed that do not do well. The indications and contraindications here

will be the same as those for bronchial asthma to be discussed later. As far as the condition of the nares and infection are concerned, it is needless to say that any operative measure must be carried out when it is patently indicated. To be sure, desensitization, or the removal of the antigenic protein, exerts a beneficial effect upon minor infections, but not in those cases where excessive adenoid tissue exists or infection of the paranasal sinuses has taken place.

BRONCHIAL ASTHMA.

Meltzer in 1910 first suggested that bronchial asthma was an anaphylactic phenomenon on the basis of the complete clinical analogy between the reaction as it occurs experimentally, and that in human beings during an attack. Additional proof is furnished by the facility with which an attack is precipitated at will in an asthmatic by the injection of that protein which has given a positive cutaneous reaction.

Etiology.—I have attempted a classification of asthma on an etiological basis. The term asthma connotes to our minds merely a clinical complex characterized by paroxysms of inspiratory and expiratory dyspnea with sibilant and sonorous sounds, and subcrepitant and mucous rales throughout the chest.

Etiological Classification of Bronchial Asthma.

1. Anaphylactic:
 - Protein absorptions from:
 1. Respiratory tract,
 - a. Animal emanations, dander.
 - b. Vegetable emanations—pollens, sachet.
 2. Intestinal tract,
 - Foods.
 3. Foci of infection.
 4. Subcutaneous tissue, or intravenous injection,
 - Therapeutic serums.
2. Nonanaphylactic:
 - Thymic enlargement.
 - Tuberculosis.
 - Renal disease.
 - Cardiac disease.
 - Bronchial infections, acute and chronic.
 - Reflex bronchospasm.

You will observe that there has been included in this classification a group of nonanaphylactic causes in which the symptom complex is identical, but in which protein sensitization does not seem to play a part. On account of the identity of the clinical manifestations, these must always be borne in mind in the establishment of a differential diagnosis. The last of the causes here classified, reflex bronchospasm, is meant to include a rather heterogeneous group of inciting causes, namely, physical exertion, overeating, inhalation of irritating vapors and dust, and atmospheric and barometric changes. A further discussion of these is made under pathogenesis and I will only say here that it is the present belief that these are never fundamental causes, but are only operative in those in whom the asthmatic habit has been established.

A word of explanation is necessary with regard to the third group of protein absorptions, the foci of infection. This is meant to include any and all foci not involving the bronchial tree itself. There have so far come under observation only three cases that seem strictly to belong to this group, one a chronically infected gallbladder, the second a

chronic appendicitis and the third a suppurating pansinusitis. The fairly large group of asthmatics with hypertrophied and infected tonsils and adenoids seems to owe their paroxysmal attacks to an intercurrent bronchial infection which cannot yet be considered as a true anaphylactic phenomenon.

In order to determine the relative importance of the etiological factors, dander, pollen, sachet, food, etc., a study was made of 100 carefully tested cases of asthma. Forty-three per cent. showed multiple sensitization. Thirty-one per cent. reacted to the pollens of early hay fever and thirty-one per cent. to late hay fever. Only nine per cent. reacted with sachet, forty-four per cent. to animal dander, and thirty-four per cent. to one or more up to twenty food proteins. Three per cent. showed distant foci of infection, thirty-three per cent. had a complicating simple bronchial infection, and six per cent. a clinically demonstrable tuberculous infection with symptoms of a true bronchial asthma. In one case thymic enlargement was observed, but there were so many protein reactions obtained that the thymus could not in this case be held responsible. It was of interest also to discover that fifteen per cent. of 700 cases of hay fever were complicated with bronchial asthma.

Pathogenesis and pathology.—Special mention has already been made of inheritance and the reason for the belief that sensitization occurs spontaneously rather than by an immunological process. In order to understand bronchial asthma some thought must be given to the functional pathology of the asthmatic and the establishment of the "asthmatic habit" and some theory advanced, even though tentatively, in explanation of those typical paroxysms induced by such nonspecific causes as exposure to extreme cold, overexertion, overeating, etc. A careful study of chronic asthma best serves our purpose here. With but few exceptions the history shows that the early attacks were definitely paroxysmal and a normal state of health prevailed in the interim. After the definite attacks have been repeatedly induced, additional disturbances are noted and exertion or exposure, formerly innocuous, now seems to produce an attack. In other words, as the result of repeated attacks from a specific protein agent we see the gradual development of what may be termed the asthmatic habit. Repeated anaphylactic reactions in the mucous membrane and smooth muscle fibre of the bronchi seem to produce such an unstable equilibrium and intense irritability that they are reflexly affected by any stimulus in the domain of the extended vagus system and these reflex paths become so established and the instability so great that any and all transitory and trivial stimuli produce great and prolonged effects always translated in these asthmatic cases into terms of bronchial contraction and congestion.

Chronic asthmatics are pathological in many other ways. The blood pressure is abnormally low, 90 to 110. Even in apparent health they are subject to spells of gastric indigestion with epigastric fullness, eructations, and pyrosis. Short attacks of an explosive diarrhea with abundant mucus are not uncommon. Dermographism is common, hyper-

hidrosis with cold and clammy hands and feet is less often observed. In fine, they seem to belong in that group of abnormalities known as vagotonics; this is further supported by a few observations on the effect of pilocarpine and the well known benefit from atropine and epinephrine.

Without further discussion, I would say that the history of cases of chronic asthma leads to the belief that this so called vagotonic state is the result of the repeated anaphylactic reactions and the asthmatic habit is one evidence of this heightened vagus tone, rather than the converse, that asthma develops in previously determined vagotonic cases. The importance of chronic bronchial infections cannot be denied. The situation here is similar to that mentioned in protein rhinitis. Mucus membranes, the seat of congestion and edema from repeated and prolonged anaphylactic reactions, form a favorable site for the growth of infecting organisms which act directly or reflexly to produce spasm in the irritable muscle fibre of the bronchi, so that spasm is added to bronchial congestion and the pathological picture of a true anaphylactic reaction is complete.

Diagnosis.—Satisfactory therapeutic results depend upon a determination of all the different sensitizations, so that any case must be approached with due regard to all avenues of protein, namely, absorptions from the respiratory tract, intestinal tract and foci of infection and all nonanaphylactic causes must be excluded. The cutaneous and ophthalmic tests are used as previously described.

Treatment. In bronchial asthma from animal emanations prevention of the attack by avoidance of the cause of trouble is preferable. Where this is not possible, desensitization is indicated with the understanding that it is not permanent. Where desensitization has been done, free exposure to the exciting cause, as horse, cat, or dog, is advisable because the desensitization is thereby spontaneously increased.

Ninety-five individuals with typical hay fever and asthma, eighteen of whom had both early and late forms and so making 113 cases, were treated with their specific pollen extracts. The results of the treatment were as follows: Asthma: not improved, five per cent.; slightly improved, six per cent.; improved, thirty-six per cent.; free, fifty-three per cent. Hay fever: not improved, four per cent.; slightly improved, five per cent.; improved, eighty-five per cent.; free, six per cent. These figures show conclusively that the asthmatic symptom is controlled far more easily than the nasal manifestation.

In bronchial asthma from sachets avoidance of the source of trouble is always indicated. In bronchial asthma from foods, avoidance of the antigenic foods should be the rule and desensitization only attempted when the reacting group includes most of those habitually included in the daily diet. For example, a recent patient referred to me by Doctor Kerley gave positive reactions to the protein from egg white, egg yolk, chicken, barley, wheat, rice, spinach, cauliflower, and pea, besides pollen of grass, dog dander, and orris sachet. It is manifestly impossible to maintain nutrition while avoiding all these reacting

proteins. In such a case as this the indications are to desensitize with the most frequently used protein of wheat and egg yolk and egg white. Whether this desensitization can be made permanent by the subsequent ingestion of these proteins remains to be seen, but I am extremely hopeful that it can. Where it is possible, desensitization has been religiously avoided and has been carried out completely in but one case. A boy, aged three years, exquisitely sensitive to the protein in egg white, was injected without difficulty. His last injection was over six months ago and he is today eating at least one soft boiled egg a day, together with puddings and cake, with no evidence whatsoever of the former symptoms of respiratory distress and acute gastroenteritis. Foci of infection, wherever found, should be eradicated. Where this is impossible, resort should be made to vaccine therapy. This applies particularly to bronchial infections. In the series of 100 cases of asthma, only six per cent. are recorded in which some form of protein sensitization was not discovered, and in which, therefore, the bronchial infection appears as the primary cause. In accord with our previous statement, the common complication of bronchial infection is merely engrafted upon and secondary to a true protein sensitization which must be reckoned with in any accurate régime.

To sum up, then, with regard to the uses of desensitization in general, I think we can say that, first and foremost, it is indicated in pollen rhinitis and asthma. It is only indicated in the cases of sensitization to sachets, animal dander, and foods when avoidance of the antigenic substance or substances is out of the question. The greatest limitation to the free use of desensitization is the grave danger not only to health but to life, and its field of usefulness is automatically restricted by the fact that its effect is evanescent.

375 PARK AVENUE.

Wounds Involving the Mucous Membrane of Mouth or Nose.—Percival P. Cole (*Lancet*, January 5, 1918) points out that there are three basic considerations to be remembered: That there is a progressive tendency of a singly epithelialized flap to shrink; that the elasticity of the cheek depends as much on the condition of the mucous membrane as on that of the skin; and that there is a great fundamental difference between real and potential loss of tissue. In the treatment of wounds involving the mouth the primary measures should be designed to produce healing with the mouth open and the buccal sulcus preserved. For this purpose an appropriate open-bite splint should be inserted as soon after the injury as possible. When it comes to closing the soft parts after fractured bones have been set and healed it is not possible to secure enough mucous membrane to form the inner lining, but the skin surface provides an excellent substitute and large gaps can be closed with almost perfect results by means of inverted skin flaps. The outer surface can then be formed from the same or other flaps. The various methods of securing and adapting skin flaps to remove defects of the cheeks or nose are illustrated in a series of excellent diagrams.

IS EARLY OPERATION INDICATED IN FRACTURES OF THE SPINE WITH CORD SYMPTOMS?*

By ALFRED S. TAYLOR, M. D.,
New York.

Although early operation in fractures of the spine with cord symptoms has been a topic of frequent discussion there still seems to be no unanimity of opinion either among neurologists, clinicians, or surgeons as to the desirability of early interference. Certain experimental data and theoretical considerations argue strongly for immediate operation, whereas unhappy clinical experience too often fails to reach the goal illuminated by experiment and theory, and leaves one somewhat cold to their further enticement.

The question of operation must be considered in relation to the different types of fracture of the spine and the resulting lesions of the cord. Fractures by direct violence usually involve only the spinous processes and laminae, the bodies of the vertebrae remaining intact and the cord damaged, if present, resulting from direct impact of bone fragments which remain displaced, plus resulting hemorrhage. Projectiles cause fractures by direct violence and carry bone and other foreign material into the canal. In both these cases there can be no question as to the desirability of surgery, the direct violence has been so severe as to fracture not only the arches but also the bodies of the vertebrae, there has necessarily been complete division of the cord and operation is hopeless. It is evident then that the only ground for discussion lies in the question of the early operative treatment of fractures of the spine by indirect violence, when cord symptoms are present.

Fractures by indirect violence are practically always the result of hyperflexion of the spine induced by falling and landing on the head or buttocks, or receiving a falling weight on the head or shoulders. The hyperflexion causes a fracture distant from the point of impact and usually in the lower cervical or the dorsolumbar region, very much less frequently in the dorsal region proper. These fractures always involve the vertebral body or bodies. There is crushing of the cancellous bone and damage to the intervertebral discs. Often the vertebral body or bodies are crushed into wedge shape with the narrow end forward causing a distinct kyphos at the level of the fracture, and frequently a projection backward into the spinal canal of the body of the damaged vertebra. In the most severe injuries there is added fracture of the articular processes, laminae, and spinous processes together with tearing of their ligaments with a resulting dislocation of one portion of the spine upon the other.

There is another type of fracture of the spine, not so frequent as that described above but still not uncommon, in which the line of fracture runs from the spinal canal margin downward and forward to the anterior aspect of the spinal column. This fracture may involve only one vertebral body or it may

*Read before the New York Neurological Society, December 4, 1917.

include the posterior inferior margin of the body just above the one chiefly damaged. In such fractures there is almost sure to be well marked dislocation of the two portions of the spine upon each other with serious damage to the cord. In certain rare cases the line of fracture is reversed and runs from below upward, with the same likelihood of severe injury to the cord. In fractures of the vertebral bodies it is obvious that the arches with their ligaments furnish such rigidity as still remains to the spine.

The lesions of the cord associated with fracture of the spine may be classified as immediate and remote. Immediate lesions include: 1. Contusion, associated with punctate hemorrhages of the cord substance at the level of injury, and not infrequently accompanied by gross hematomyelia. There is always a secondary edema. The loss of cord function may be partial or it may be complete. After a time, varying with the severity of the individual case, there will be a recovery of cord function more or less complete. 2. Internal distortion of the cord, in which the external form and matting are maintained but the gray and white have been so churned and mixed up as to Hemorrhage and edema occur in the damaged zone. 3. The cord function is complete and permanent. complete severe degree of injury results in the divided division of the cord with separation of the permanent. Here also there is complete and cause a loss of function. 4. Remote lesions Without gross myelitis from projecting bone. is important into the detailed symptomatology it cases there is remember that in many of these it and below complete loss of function in the cord impossible below the level of the lesion, and that it is impossible to determine at the start whether or not there is a permanent complete transverse lesion of the cord substance, since many apparently complete transverse lesions show spontaneous improvement after weeks or months. Therefore the decision for or against immediate operation cannot be based upon the presence of symptomatic complete transverse lesion of the cord. Instead of expressing a definite opinion for or against immediate operative intervention in given cases it might be worth while to consider briefly what should be the aims of treatment, whether operative or nonoperative, and to discuss the difficulties and dangers associated with the accomplishment of those aims with the hope of arriving at a working basis for the care of these unfortunates. The treatment of the bony fracture *per se* is entirely a secondary consideration. The primary aim of treatment must be to preserve and restore the function of the damaged cord.

The damage to the cord consists of several components: complete division of elements of the cord, which occurs at the time of injury and is permanent regardless of the kind of treatment; hemorrhage, which occurs at and shortly after the accident, causing cord symptoms which may clear up with the absorption of the blood, and edema which occurs shortly after the injury, involves the entire damaged area and causes loss of cord function which will be restored only if the edema is absorbed

before the resultant pressure has caused degeneration of the cord elements. In addition, displaced bone fragments which press upon the cord will cause myelitis with loss of function sooner or later. It is obvious that treatment can modify only those conditions and symptoms which result from the pressure of hemorrhage, edema, and displaced bone. Repeated clinical experience proves that the swelling of the cord resulting from injury will distend the dura firmly and subject the nerve elements to serious danger of pressure degeneration.

Theoretically the thing to do would be a generous laminectomy, a wide splitting of the dura, and incision of the posterior columns of the cord for the relief of the hemorrhage and edema. The experiments of Allen, of Philadelphia, upon the cords of dogs are pertinent. Briefly, he did laminectomy and then balanced a miniature pile driver over the exposed dura so that he could deliver a known impact by measuring the height from which the weight was dropped. From a number of experiments he determined the impact which would cause permanent loss of cord function. In a second series he used an impact equal to or greater than the determined amount and then immediately split the dura and incised the cord itself through the posterior columns, leaving the dura open and closing only the superficial wound. This second series recovered cord function more or less completely. To obtain this recovery it was necessary to split the dura and cord very promptly after the impact. While such speed in splitting the dura and cord could not possibly be attained in the human victim, nevertheless these experimental data plus the theoretical considerations made it desirable to try the earliest feasible laminectomy with splitting of the dura and incision of the cord. Accordingly three patients were operated upon at various times in Fordham Hospital.

CASE I.—The first case was that of a colored chauffeur who had been thrown out of his car and landed on his neck, suffering a fracture of the fifth cervical. There was complete loss of motion and sensation below that level. On the third day he was operated upon and a laminectomy done. When the dura was exposed it was distended and firm, and when the first cut was made through it the substance of the cord spurted out very much like the cheesy stuff from a tuberculous gland. The dura was split wide open and so left. The muscles and skin were closed without drainage. His temperature, which had been between 102° and 103° F., promptly went up to 105 and he died within twelve hours.

CASE II.—The second case was that of an Italian of thirty-five years of age. On March 5, 1915, he was struck across the shoulders by a falling tree, suffering a fracture of the fifth and sixth cervical, with complete loss of motion and sensation below the level of the fifth. On March 7th, two days after injury, he was operated upon under cocaine and ether anesthesia. The laminae from fifth cervical to the first dorsal were removed. The dura showed marked distention from the sixth cervical down to first dorsal. When the dura was opened the cord, which was quite mushy, again oozed out. The muscles and skin were closed without drainage. There was no improvement and he died March 9, thirty-six hours after operation, temperature 103° F.

CASE III.—The third case was that of a Bohemian twenty-eight years old, who on May 21, 1915, was thrown from his cart to the street, landing on his buttocks. There was fracture of the body of the twelfth dorsal, and fractures of the transverse processes of eleventh dorsal and first, second, and third lumbar. There was entire loss of motion and sensation in the lower extremities and loss

of sphincteric control. Otherwise his general condition was good. On May 26th, five days after his injury, he was operated upon under ether, eleventh dorsal to second lumbar laminae being removed. The cord was badly damaged but in this case did not mush out through the dura. Nevertheless the man died within forty-eight hours, and undoubtedly the operation was the determining cause of his death.

In watching the preparation of these patients, their transfer to the operating room, anesthetization, transfer to the operating table in the prone position, the operation, and finally all the handling incident to the return to bed, and especially remembering that this handling is necessarily done by those with very little experience in these cases, I was strongly impressed with the great probability of increasing the damage to the cord from the repeated twisting and bending of the broken spinal column. If, in addition, the damaged portion of the spine were given increased freedom of false motion by the removal of the spines, laminae, and associated ligaments the liability of further damage would be still greater. After operation it is scarcely possible to give external support by means of a plaster jacket because here again the handling necessary would be prohibitive, and the jacket once applied, if sufficiently firm to support the spine, would almost surely start pressure sores below the level of the lesion, and if it is applied so loosely as not to cause pressure sores it will be so loose as not to control the spinal column. Because it is not possible in the human subject to carry out Allen's procedure with sufficient promptness to get the good results obtained in his experiments; because of my experience with the cords above cited and the deaths which promptly followed operation; because of the dangerous handling necessarily incident to operation; because of the increase of false motion likely to follow the removal of the arches and their ligaments; and because of the impracticability of fixation of the fractured spine by external apparatus, it seems to me undesirable to subject fractured spines, where the vertebral bodies are involved, to early operation, meaning by early, any operation done within the first week. There seems to be no difference of opinion about this conclusion when dealing with cases which show symptomatic complete transverse lesion of the cord, but difference arises apparently over the treatment of those cases which start with less than a complete transverse lesion or show within the first few days or weeks some evidences of returning cord function.

It is well known that patients who have survived fractured spines with the return of a fair amount of cord function are often greatly improved by exploration and the correction of such disturbances as are physically amenable to treatment, even if the exploration is done after many months. Therefore in these debatable cases it would seem to be chiefly a question of time at which exploration should be done, and a number of factors enter into the decision. In these cases all the difficulties and dangers of the manipulations incident to operation, the same difficulties in supporting the spine postoperatively, as above mentioned, etc., still exist. The injury to the cord is of two kinds, that of the primary force and that from resulting hemorrhage and edema. The primary injury is definite at the start. If sec-

ondary edema is sufficient to cause trouble there should be increasing loss of function, in which case immediate operation might be indicated. If there is improvement after a few days, that means diminution of edema and less urgency for interference.

From cases similar to those presented, because of the manipulative risks of operation, and because improvement indicates diminution of the traumatic sequelae, it seems to me that operation should be deferred until the vertebral bodies have become solid enough to stand handling, and only then if improvement should be slow and unsatisfactory or should cease too soon.

115 WEST FIFTY-FIFTH STREET.

PITUITARY TUMORS FROM THE SURGICAL STANDPOINT OF THE RHINOLOGIST.*

BY OTTO J. STEIN, M. D.,
Chicago.

The rhinologist's field has been involved intimately with this subject owing to a route having been selected for approaching the sella surgically. In consequence of this a practical procedure has been developed that commends this avenue of approach over many others.

The sella region can be reached endonasally in several ways. The midnasal method of operating is followed in most of the operations; the lateral nasal method is employed in others, and a combination of the two methods is used in a few. The midnasal method follows the septum all through the operation, the object being to enter the sphenoid sinus and remove its septum and that part of its upper and back wall constituting the floor of the sella upon which the hypophyseal gland rests. The incision employed in this method varies considerably. Some operators, as Cushing and Kanaval, begin the incision external to the nose. Cushing makes his beneath the upper lip and Kanaval starts through the skin of the upper lip close to the alae nasi. These and other external methods of approach are usually employed by the general surgeon to secure as much room as possible, not being accustomed to work through smaller opening as is the rhinologist. Again, some operators follow the methods of West and Citelli, who start far back on the septum. With few exceptions, the operators employing the midnasal or septal route make their advance between the membranes of the septum, removing the cartilage and bone as they advance all the way to the sphenoid. This is one of the desirable features of this method, as will be shown later. Those not following this technic remove all the structures of the septum in their path. The earlier operators in this field of surgery, Schloffer, Ollier, Von Eiselberg and Proust, all of whom turned the external nose aside by various incisions, removed not only the septum, but such important structures as the lower and middle turbinates, ethmoid cells, etc. West

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operates within the nostril and removes the posterior part of the septum only. Hirsch, whose technic is that of the classic submucous resection method, obtains results with greater safety, less trauma, greater rapidity, quicker recovery and less untoward effects, thus bringing to the rhinological surgeon a rational

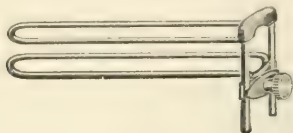


FIG. 1.

operation with which to uncover the pituitary region. In my surgical work on the hypophysis I have in all my cases followed this method of operating, because it appears to be the safest, most direct, most certain, and least difficult.

The safety lies in confining the operation between the membranous flaps of the septum, which are brought together afterward, thus shutting off the sphenosella operated area from the nose entirely. A rigid technic and preparation will minimize danger of meningeal infection to the same extent secured by other routes. The interior of the nose is more sterile than the mouth. The external nose and the nasal vestibule can be thoroughly sterilized. The endonasal route employing the midnasal method shows a minimum mortality rate over that of others if the larger number of these operations is taken into consideration. Statistics have a value only so far as cases are reported. Many of those operated are not reported and their results both immediate and remote are not included. Cope, whose compilation I report, gives a mortality rate from meningitis of 8.6 per cent. in twenty-three cases operated by the transfrontal route; nine per cent. in 132 cases by midnasal method; and twenty-five per cent. in sixteen cases by Schloffer's method. It would seem, therefore, that the larger mortality is due to the excessive operative work in the nose. This would

of the sphenoid is not as difficult as generally believed. Utmost care is exercised in separating this membrane around the ostei. If more room is desired, remove one middle turbinal. The sinus is entered at the ostium, its anterior wall removed in all directions, and the septum between the two cells is removed without much difficulty. This is about the only place I use the chisel, unless I have one of those cases where there is a horizontal ledge on the inner wall that I will refer to later. The sella fossa is best entered by using graded sizes of sharp bowl shaped curettes used in the manner of a drill, after which the opening is enlarged with the mushroom head punch forceps. In this way the inferior surface of the gland is exposed to view. The capsule is then incised, the gland explored for cyst, or the tumor removed. The field is constantly under inspection, as bleeding is not troublesome. If no tumor is found the operation can terminate as a decompression. The membranes are approximated

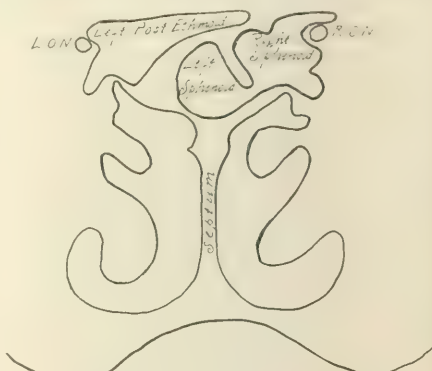


FIG. 2.

leaving an iodoform drain in between for sixteen hours. A wire nasal splint, like the one I here show, holds the flaps in approximation after the drain is removed for an additional eight hours.

The lateral nasal method of operating leaves the septum intact and approaches the sphenoid either through the nostril by removing one or both turbinates and exenterating the ethmoid labyrinth, or by making an entrance first through the maxillary antrum from the oral cavity and then into the ethmoid region. The latter approach is believed to be somewhat nearer although its direction is oblique. In either instance the turbinectomy and ethmoid exenteration can be undertaken as a preliminary procedure some days before the sella operation. It suggests that the operator must assure himself beforehand of the presence of a sphenoid cell as well as its size and location on the side selected for operating when using this method. This may prove difficult for some even with good pictures. If a posterior ethmoid cell should occupy the ordinary site of the sphenoid cell embarrassment may ensue Figs 6 and 7. Besides, the cell may be so small on the side selected as to limit one's operative approach to the sella floor. A careful study of the röntgeno-



FIG. 3a.

apply to the lateral nasal methods where ethmoid exenteration is employed. The midnasal method is not the shortest route, but nevertheless the more direct because it has the septum as a guide which makes working more certain. The elevation of the membranes covering the rostrum and anterior face

grams should be made in all cases, no matter what route or method of procedure is employed.

This leads me to advise men taking up this work to consult the opinion of those who, working in their respective fields, may be especially informed on pituitary disorders. Owing to the rhinological

the auditory canals. The sella may be widened and deepened and its floor may even be absent. The posterior clinoids may appear pushed upward or they may be absorbed and the anterior wall of the fossa may incline greatly forward thereby increasing the size of the diaphragmatic opening. The floor of the sella, ordinarily smooth and regularly concave, may be flattened or uneven in outline, with perhaps erosions or irregular elevations. It must not be understood from what has been said regarding sella changes that all or any of these changes must necessarily be present in either acromegaly or hypophyseal dystrophy, because in acromegaly pituitary tissue may be in the sphenoid sinus or even in the pharynx vault, and in hypophyseal dystrophy a neighborhood tumor may press from above occasioning no further change than a sharpening of the clinoids. Infundibular tumors, like cysts, may dilate upward into third ventricle area and occasion little change in the sella. Furthermore, extrasella pathology, such as hydrocephalus, lues, and tuberculosis, may create distortion of the sella independent of pituitary changes.

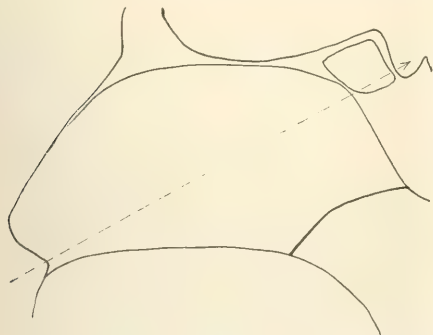


FIG. 3.

surgeon's facility for operating in this field the necessity has arisen for increased consideration being given to differential diagnosis and pathology. Every available bit of evidence that can contribute toward enlarging the knowledge of this subject should receive earnest attention and study. The internist or neurologist is well informed on kindred and allied conditions, therefore his advice is valuable. The ophthalmologist sees these cases at a period when an accurate diagnosis is most essential. By his charting of the fields and study of the discs he may tell the location, size, and extent of the brain lesion and on account of the rapid failing vision in many of these cases, he is the first one to have the opportunity to make the diagnosis. The röntgenologist can be of the greatest assistance to the surgeon, but his aid is greatly augmented by an intimate knowledge of this particular subject. A good

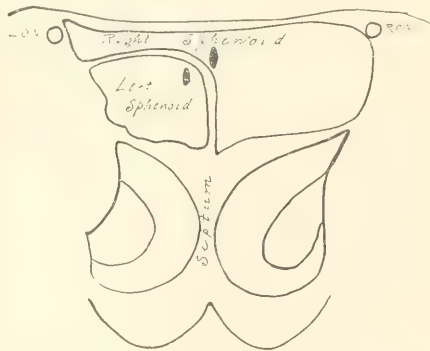


FIG. 5.

In selecting a method of approach to the pituitary region safety should be the first consideration. If to this can be added simplicity, directness, rapid convalescence, and a minimum trauma, then we more nearly reach a rational procedure. None of the methods employed are ideal for all pathological conditions. If one is satisfied with a decompression, the endonasal route approaches the ideal, but for the complete removal of a tumor especially of considerable size, or if malignant, it falls short of the ideal. This is true, however, of any other route. As one approaches the floor of the sella from below through the sphenoid sinus, a surface of about eleven by eleven millimetres is presented for operation. This surface varies considerably not only in its measurements but its thickness. Cope took the dimensions of over fifty skulls and found the sella fossa to be in the anteroposterior diameter seven to fourteen millimetres; transversely, nine to fifteen millimetres; vertically, three to ten millimetres, while the normal gland within this cavity weighs about 0.5 gram. The anterior wall of the fossa inclines slightly forward and ordinarily presents a promontory on the inner sur-



FIG. 4.

picture can show evidence of capacity and dimensions, not only of the sella, but also of the sphenoid cells. In acromegaly one may find enormous nasal sinuses, an increase in the size and thickness of the skull, the occipital protuberance greatly hypertrophied, contraction of the orbits, and narrowing of

face of the sphenoid (Fig. 1a). The bone is thin at this place ordinarily and it makes the ideal point of attack in operating, but at times it is quite thick, depending upon the vagaries in the development of the sphenoid sinus (Figs. 9 and 10). As a rule the absorption that takes place in the body of the



FIG. 6.

sphenoid in the development of the sinus commences in the presphenoid area but may be arrested here, leaving only the anterior wall of the sella separated from the sinus by a thin wall while its floor rests upon solid structure (Fig. 3). If the absorption proceeds normally, both the anterior wall and floor of the sella will be separated from the sinus by a thin wall (Fig. 4). At the place where the arrest may occur either a horizontal ridge or septum may project into the sinus (Cope). This condition if encountered might add some confusion and difficulty to the operation. Onodi's work on sinuses shows several variations in both position and size of the posterior ethmoid cells. In one specimen the right sphenoid cavity occupied a part of the left cavity position so as to exclude the latter from any relationship (Fig. 5). This I have myself encountered in operating for hypophyseal disease. In another specimen the left posterior



FIG. 7.

ethmoid cell occupies the position of the corresponding right sphenoid (Figs. 6 and 7). When operating by the lateral nasal method and especially by the oblique antrum route these variations if encountered would add confusion and perhaps defeat a successful result.

In the performance of a number of dissections in this region I have never as yet found the chiasm located in the optic groove as stated in our anatomies. This has an important bearing on the pathology of the gland. The optic groove is a transverse furrow about one centimetre wide, just in front of the tuberculum sella, which is the upper edge of the anterior wall of the fossa. At either side it terminates at the optic foramen where the optic nerve and ophthalmic artery enter. The chiasm I found lies just above the diaphragma sella considerably posterior to the optic groove and at about the centre of the fossa or even over the posterior lobe. The optic nerves pass off forward in an oblique direction. The space between the chiasm as the apex and the two optic nerves as the sides and the tuberculum as the base is called the trigonum presellar, and through this area passes the infundibulum or pituitary stalk. At this place the diaphragm of the sella is thinnest and offers less resistance through the pressure of the upward growth of the tumor. From the description of this arrangement one sees that the anterior lobe of the pituitary lies well in front of the chiasm and

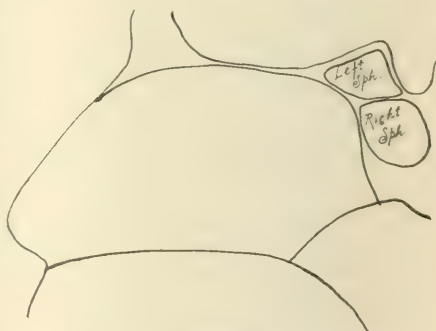


FIG. 8.

tumors of this lobe may assume some size by their upward growth before causing much pressure on the chiasm.

There seems to be considerable confusion regarding the pathological findings in the cases operated. It appears reasonably conclusive that changes take place in the pituitary similar to those found in the thyroid gland of which the principal ones are hyperplasia, adenomata, and cysts. All varieties of disease have been mentioned as occurring in this gland including lipoma, fibroma, cholesteatoma, echinococcus cyst, sarcoma, and epithelioma (Francis Carter Wood). Primary malignancy appears to be comparatively rare, while metastasis have been reported. Two cases of metastasis associated with cancer of the breast are mentioned by Sckiguchi (1). In my own cases the pathology, like those of many others, is not always quite clear. Nine cases have come under my personal observation in all of which I operated, excepting one. Five have been classed as adenomata, and one as a cyst. Another one, included in the above adenomata cases, had in addition a large cyst. One of the adenomata cases was pronounced

by some as a parathelioma, although this patient has continually improved since he was operated on in July. In two cases no tissue was removed. One of these was diagnosed as an adenomata from clinical appearances. In one the specimen was lost and the two curettings of tissue removed could

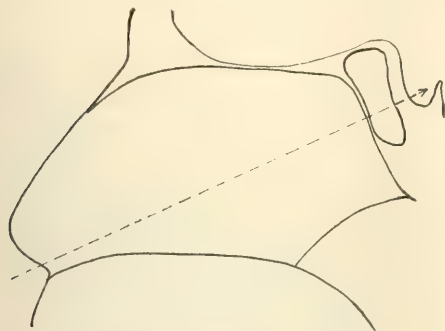


FIG. 9

not be identified clinically. Their ages ranged from thirty to sixty-six years. Six were males and three were females. The chief symptom in all but one was loss of vision. Three showed marked functional pituitary disturbance. Headache was present to some degree in all. In one it was very severe and almost the only symptom. The immediate results from operation nets a great improvement in symptoms in five cases. One patient died on the third day, presumably from acidosis; no autopsy was done. One case was complicated by meningitis, but the patient survived. One had a slight hemorrhage in the left hemisphere but completely recovered in a few days. The remote effects from operation show one death after one and one half years from a cyst that was apparently not present at the time the operation was performed

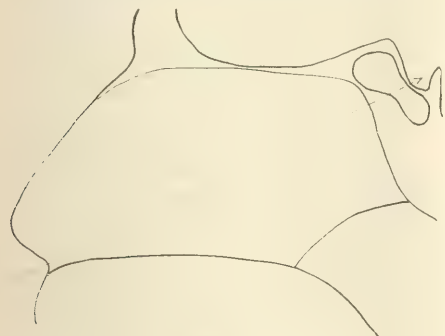


FIG. 10.

when a large decompression was done for an adenoma. There was a disappearance of the headache in most cases; also the vertigo when present. Continued improvement resulted in the sight or the improvement was maintained in those showing immediate benefits.

I have presented at this time only the salient

features of these cases because some of them have already been reported by me, and others are too recent to give remote results. I shall make a further report at a future time.

REFERENCE.

1. L. SCKIGUCHI: *Annals of Surgery*, 1916, Lxiii, 297.
77 EAST WASHINGTON STREET.

ISCHIORECTAL ABSCESS FROM A BROKEN SURGICAL NEEDLE.*

*Followed by Fistula Ani, Operation, and Recovery
of the Needle After a Period of Two Years.*

By JOSEPH F. SAPHIR, M. D.,

New York,

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the Rectum, German Poliklinik.

In presenting the following case, I wish to emphasize the necessity as well as the importance of complete and thorough laying open of an ischio-rectal abscess as well as a fistulous canal, and probing of the affected area for branch canals, pockets, and foreign bodies.

CASE.—H. B., aged thirty-six years, bartender by occupation, was seen by me for the first time on November 7, 1917. He gave a history of having had some stomach trouble two and a half years ago. He went to a physician in Brooklyn, who put him on a starvation diet, gave him no medication, but gave him rectal enemas two or three times a week for eight months. She told him that he had strictures in the rectum, and to use the patient's own words, "She would run her finger into the rectum and claimed she lifted something." After eight months of this treatment, the patient noticed severe pain and then a discharge from the rectum. The pain was especially severe when the doctor attempted to insert the tube into the rectum for irrigation, so severe that he refused to permit her to insert the tube. She then ordered him to apply hot water bags to the anus. This gave him no relief and he was laid up in bed for a period of three days, with chills and fever, when he called his family doctor, who told him that he had to be operated upon. He was taken to a hospital in Brooklyn, where he was operated upon on the following day. Here he remained for two weeks, and was laid up for four weeks more at his home, but noticed no improvement. He still suffered severe pain and a discharge from the rectum. He received treatment at the hands of his doctor for an entire year, when in January of this year, his doctor again operated upon him. The patient said: "He had to burn some things in the rectum. He said that I had rectal tuberculosis and also two glands in the rectum, which were caused by the insertion of the tube." This time he remained in the hospital for one week, and then at home for another week. He received treatment once or twice a week for a period of three or four weeks when the discharge stopped. Every now and then, he would have an attack of severe pain in the rectum, followed by a discharge of pus, when he would go to his doctor for further treatment. This continued until about one month ago, when he noticed a distinct swelling, extremely painful, on the left side of the anus about two inches from the anal margin. This swelling was painful on sitting, standing and walking, and when I saw him November 7th, it was too painful and sensitive to permit of a rectal examination. However, under local anesthesia of quinine and urea hydrochloride, $\frac{1}{2}$ per cent., the abscess was incised, the pus was evacuated, and proper drainage was instituted. Two weeks later, a rectal examination by means of the finger, revealed a peculiar bulging of the mucous membrane located about two inches above the anal opening. This felt hard and indurated, and presented two distinct knoblike masses, the apices of which were about an inch apart. The mucous membrane seemed intact. A distinct, hard, thickened substance was felt when a probe was in-

*Read before the Eastern Medical Society, December 14, 1917.

serted into the fistulous tract. With the finger of the left hand in the rectum in contact with these knobs, I could with the right hand guide a probe into the fistulous tract up to these knobs, and could elicit that familiar rough feeling when a foreign body is present.

I told the patient that an operation for fistula was necessary and that in all probability a foreign body was present. He was admitted in the Peoples Hospital where, on November 30, 1917, under a general anesthetic and with the usual antiseptic precautions, he was operated upon. With a curved steel grooved director and probe, the internal opening of this fistula was made at the location of one of these knobs, about two inches above the anal opening, necessitating the cutting of both the external and the internal sphincter muscles for the purpose of getting proper drainage after laying the tract wide open. Curetting of the fistulous tract brought forth half of a curved surgical needle, three quarters of an inch in length, which evidently had been broken off and remained imbedded in the soft tissues at some previous operation. Infiltration of the tissues and attempts on the part of Nature to encapsulate thoroughly this foreign body, produced the two knob like protuberances within the rectum, which confused the doctor into believing them to be tubercular glands. On the strength of this the doctor warned the patient's wife against pregnancy, as her offspring would be tuberculous. It was this foreign body which prevented healing following the previous operations, and there is no doubt in my mind that its removal will permit perfect healing, and that he will be cured of his fistula. After curetting, the base and walls of the tract were swabbed with 95 per cent. carbolic acid followed by 95 per cent. alcohol; the edges of the wound were trimmed to prevent turning in and bridging over while healing, as well as to permit of better drainage; a strip of sterile moist gauze was inserted in the bottom of the wound, and the usual sterile dressing and T binder were applied. The patient was out of bed the next day, and two days after the operation, left the hospital.

He has been on a full diet since the first day after the operation; has had a comfortable fecal movement every day since then with very little discharge, except that which was normal in a granulating wound. He was relieved of the discomfort of having inserted into his rectum that relic of surgical barbarism, the rubber hose surrounded with iodoform gauze. He was not kept under opiates, nor were his bowels tied up for a week. He left the hospital two days after operation and was fit to attend to his work at the end of a week. He calls at the office daily for aftertreatment, and later will require local treatment every other day for four to six weeks, when I expect him to be cured. He now feels comfortable, the wound is granulating nicely, and he has full control of his bowels, and a daily movement.

The important points that I wish to bring out in this case as well as in the care and treatment of fistula cases in general are:

1. The necessity for early and correct diagnosis.
2. The necessity for more frequent rectal examinations in conjunction with a probe.
3. The necessity for trimming off the edges of the wound, to prevent bridging and too hasty healing, and for better drainage.
4. The necessity for keeping the wound clean and properly drained to prevent infection.
5. The sphincter muscles, when cut at right angles to the muscular fibres, will not cause incontinence.
6. The ability to get along without locking up the bowels for a week, without the use of opiates, and without plugging up the rectum with that relic of barbarism, the rubber hose.

62 WEST EIGHTY-NINTH STREET.

A NAUHEIM METHOD.

Its Chemistry; Physiological Action; Dynamic Application, Including Technic, Rationale, Indications, Contraindications, and Accessory Measures in Treating the Commoner Cardiovascular Disorders.

BY N. PHILIP NORMAN, M. D.,
Watkins, N. Y.,

Formerly Resident Physician, 1st Division, New York Neurological Institute; Physician to the Glen Springs.

(Concluded from page 535.)

RESULTS.

Before taking up the results that may be expected from the carbonated brine baths it is my purpose first to attempt an explanation of their effects upon some of the special organs that are either diseased coincident with the heart or whose function has been deranged as a result of the heart disorder or, when these organs are diseased, deranges the function of the heart.

The myocardium is increased in tone and in contractile efforts by the carbonated brine baths. If for the many reasons it has lost its tone and its contractibility has been lessened it necessarily follows that the ventricular walls will become weak and dilate. With the weakening of the walls and dilatation, a feeble contractility follows. Functional efficiency is impaired in proportion to the degree of the weakness and dilatation of the walls and the feebleness of contractions. This inefficiency causes the heart to overexert itself in an attempt to meet the demands of the body, yet in many cases instead of overcoming this it fails, thus ever increasing the burden. This poor circulation not only affects the body tissues but the heart tissues as well. Elimination is not so rapid as under normal conditions and thus the waste products accumulate faster than they are disposed of. Other organs suffer from this increase of waste products and the irritations of these substances produce congestions. The whole body suffers from lack of proper nutrition. If not checked this goes on till death. The power of the heart muscle to contract quickly and powerfully depends upon its proper nutrition. To a great extent this is regulated by the quantity and quality of blood that it receives. Its nutrition is through the coronary arteries which leave the aorta just above the sigmoid valves and consequently it receives the choice of bloodstream that is fully arterialized. It is the organ that is most dependent upon the proper aeration of the blood. If blood quality and blood quantity is deficient, malnutrition occurs, and later, degenerations. If a heart dilates and hypertrophies, even though there is no change in the size of the coronaries, they may become relatively too small to supply a proper blood supply to this increased space.

The heart is nourished in diastole; it rests in diastole. Therefore, any measure that would increase its contractile efforts and increase its tone would be of benefit: carbonated brine baths do this. A stronger pulse results, and the balance between the arterial and venous system tends to be effected. Carbonated brine baths slow the pulse and promote a better respiration. Diastole is therefore in-

creased. Aeration of the pulmonary circulation is facilitated. The heart's nourishment period being in diastole and its rest period being during this phase it is seen that it is better nourished with blood of a higher degree of aeration and that its rest period per minute is materially increased. Dilatation is decreased because of the better muscle tone and the relief from the overload; hypertrophy is not so necessary and decreases because of the lessening of the burden. Thus, we effect or reestablish a harmony and, beside doing this, repair a structure so that it is able to cope with the demands made upon it by the activity of the individual in his daily life.

Arteries.—The arterioles, peripherally, are first contracted by the carbonated brine baths and thus a positive resistance is offered to cardiac action. At this phase the heart must possess a certain amount of reserve power and is "on its mettle." Later the reaction occurs with its dilatation of these blood-vessels. When the heart was whipped up by this positive peripheral resistance, ventricular effort was much increased and blood pressure was increased. More blood was forced through the capillaries and this increased impetus served to hurry the venous return. Then the dilatation occurring in these peripheral arterioles and capillaries lessened the resistance and increased the peripheral blood containing capacity so that the arterial blood quantity was increased, lessening perceptibly the amount in the veins and relieving the internal congestion. With a better balance between arterial and venous blood quantity it is seen how the arteries help the heart. In cases that react satisfactorily one expects a slowing of the pulse, with a full, regular beat, an increase of blood pressure, and a reduction of cardiac size. If the opposite occurs, functional tests should determine again the advisability of giving the baths. Sometimes a weaker bath, in brine, CO_2 , or both, and of shorter duration, will be well borne and produce the desired reaction.

The coronary arteries that supply the musculature of the cardia are benefited in two ways by the CO_2 brine baths: 1, by the increased blood supply due to the acceleration of the ventricular efforts by the bath, thus furnishing a richer and more abundant supply of blood; and, 2, diastole being prolonged, and systolic force increased facilitates a better emptying of the coronary veins, relieves the heart muscle of congestion, and allows for a fresher and greater amount of blood to be pumped to the muscle.

Veins.—Inference may be drawn from what has been said about the effect of the CO_2 brine baths on arteries that its effect upon the veins is indirect. It has been shown how a greater arteriovenous exchange is effected, thus creating a better balance. It is found that the venous pressure falls as soon as the right side of the heart is able to care for its work, incident with other changes produced by the baths. Venous tone is increased because of better nutrition and decrease of this abnormal back pressure.

Respiration.—During a carbonated brine bath a good amount of CO_2 is inhaled. This acts directly upon the respiratory centres, through the blood and indirectly stimulates the respiratory centre through the terminal filaments of the pneumogastric and

through the terminal filaments of the trigeminal nerve. Respiration is stronger, slower, and deeper. Respiratory embarrassment is relieved by the increased efficiency of the heart, which relieves pulmonary congestion and edema.

Kidneys.—Kidney function is impaired by any disorder of the heart that causes venous engorgement. With venous engorgement present in a moderate degree with low blood pressure, the amount of blood flowing through the kidney is lessened and a correspondingly decreased amount of waste products is excreted. With venous engorgement the blood quality is richer in waste products. Kidney tissue is irritated by this increase of toxins. Irritation may produce a contraction of its arterioles. High blood pressure due to excessive back pressure puts an undue constant tension on these arterioles and since involuntary muscle is very ineffective in resisting such continuous tension, a resultant leakage of serum through the glomeruli is inevitable and albuminuria is the result. Continued engorgement will produce degenerative changes which are beyond repair. During this state of venous engorgement the amount of urine is lessened.

The carbonated brine baths, by increasing arteriovenous exchange, tend to lessen this engorgement, increase the flow of blood at a nearer to normal blood pressure, and promote diuresis, thereby lessening the toxemia. The purer quality of the blood enhances the kidney's nutrition and promotes a better functioning. The kidney is said to have an internal secretion. This internal secretion is said to be, in a measure, a pressure regulating secretion. Any alteration of this secretion tends to increase the blood pressure. Therefore, restoration of function or increase of function would affect the blood pressure favorably.

Liver.—An alteration in the amount and quality of blood flowing into the liver would seriously impair the intricate chemical function of this organ and directly and indirectly affect the nutrition of the body because of a deranged metabolism. With a congestion of the liver is noted a marked flatulency and gastrointestinal disturbance. This flatulency serves to compress the heart, to change its rotative axis and thus further burden it with its overload. Carbonated brine baths by lessening or eliminating this congestion relieved the symptoms and the cardiac handicap. Metabolism is increased.

The vegetative nervous system embraces the autonomic and sympathetic nervous systems including the endocrinous glands. This is but a generalization as a fuller discussion is not possible. The intimate relationships that these glands and nervous systems have in the correct or incorrect functioning of the cardiovascular apparatus is acknowledged by every one. Vagotonics, sympathiconics, myxedemas, hyperthyroidisms and hypothyroidisms are clinical pictures that are associated more or less with cardiovascular disorder. Unfortunately, our data is practically clinical throughout. Laboratory workers are studying and experimenting in an effort to find some means of estimating more accurately what part they play alone and in combinations upon the body function as a whole. The deductions as to the part that carbonated brine baths play in these

disorders are but empirical to a large extent. Yet the results that they produce in selected cases of hypothyroidism and hyperthyroidism, vagotonics, and sympathicotonic evidences in part at least that this action is direct. Undoubtedly the major portion was due to a better balanced circulation through the carbonated brine bath thus effecting a better dynamic and metabolic function. A better metabolism is perhaps in part due to the radium in the brine.

After the foregoing consideration of the effect of the carbonated brine baths upon the most important organs and structures of the body, a discussion of their dynamic application to the following cardiovascular disorders is in order. First, the heart muscle will be given attention because of it being the central spring of functional efficiency.

Myocardial insufficiency.—Functionally this condition is divided for convenience into five classes. Beginning with the hopelessly crippled cardiovascular system to the case of incipient decompensation they are as follows: 1. In senile cases in which the insufficiency is accompanied by advanced arteriosclerosis and a serious renal involvement the baths are contraindicated absolutely. Because of the amount of myocardial degeneration and arterial sclerosis it is obvious that this myocardium cannot possess any reserve, and therefore could not qualify for the stress of the carbonated brine bath. 2. Cases of severe decompensation, markedly dilated heart, anasarca, serous effusion into almost all serous cavities, orthopnea, static albuminuria and oliguria, in which there is no reserve in the myocardium as attested by weak, irregular, and rapid pulse, contraindicate the baths. Orthodox medical measures are to be used instead and prognosis is grave. 3. Patients showing a more than moderate amount of cardiac dilatation, with considerable dyspnea, pulmonary edema, pendant edema, a more or less enlarged tender liver, and a diminished urinary discharge are not fit subjects for the carbonated brine baths. These patients should receive rest, diet, and medication at home until they regain their compensation; then after careful functional tests it is determined whether they have enough reserve for the baths. If they have sufficient reserve one may offer a guarded optimistic prognosis. If not possessed of this reserve, further treatment is necessary until functional tests demonstrate their fitness for the baths. Prognosis should be guarded as no one can foretell the mishaps that may befall these cases. The slightest indiscretion in diet, exercise, and emotion may wreck the optimism that has been instilled in the patient and his family. These are the individuals who are sent to institutions in the frantic expectation of either arresting the increasing chaotic cardiovascular condition or effecting a result that is nothing short of phenomenal. If the luckless physician understands little about the indications and contraindications of carbonated brine baths, in his anxiety to do something, he directs his patient to a hydriatic shrine famed for its "cures," instilling an undue amount of faith in him as to the mystical efficacy of these baths. After a journey that has exhausted the patient to the point of collapse, he arrives and begs for a bath at once. When told the truth, hope vanishes and faith is destroyed at the

expense of the one who directed and advised him, and often the journey back closes the episode. Some, being more venturesome, remain, medical treatment is instituted, and after a time they are fit for the baths that "bucks them up" for a few months, when another course is resorted to as soon as compensation is deranged. If this article serves to impress the home physician that it is far wiser to leave the rationale of the baths to the discretion of the spa physician, and that carbonated brine baths are not to be advised as miraculous for all heart cases I shall indeed feel repaid for my labor. Some cases of this class need institutional treatment and an understanding should be had with the patient before he leaves that the baths are to be instituted only after he is fit for them. The question arises: How soon shall the baths be prescribed after compensation is reestablished in the patient sent for institutional treatment? Roughly speaking, eight days. At this time the cardiac reserve is determined by repeated functional tests, and if found satisfactory the baths are cautiously prescribed, noting pulse rate, blood pressure, and other signs to detect cardiac embarrassment should it occur. 4. The brine baths should not be prescribed in cases in which the reserve force is below par, manifested by shortness of breath on exertion, erratic heart action, slight nocturnal pulmonary edema, slightly enlarged and tender liver, and varying and transient attacks of sternocardia, with either a high blood pressure or a low blood pressure and general fatigue either upon exertion or without exertion. These patients may or may not complain of any of these symptoms yet it is impossible to tell just what degree of degeneration is present until a complete physical examination is made. Functional tests here serve in good stead and indicate to a certain extent how much a heart will do before it revolts. Such cases may be caused by sudden overstrain, continued mental and physical overstrain, hypertension, or hyperthyroidism in formerly normal hearts or hearts slightly affected but functioning normally that are not able to meet the extra demands. Then there are the hearts in this class that are weakened by syphilis, the intoxications, insufficient exercise, operations, faulty metabolism, anemias, and the so called inherent muscular weakness with asthenia. In this class of cases carbonated brine baths are of benefit. It is not to be forgotten that the etiology is kept in mind at all times and measures taken to eliminate them or to counteract their effect. 5. Brine baths are not prescribed in angina pectoris. This disease is due to faulty coronary artery circulation. Faulty nourishment of the myocardium results with degeneration. With degeneration contractile efforts are weakened. This results in overexertion on the part of the heart so as to compensate for its weakness. For these reasons it is justifiable to include this symptom complex under myocardial insufficiency. Unless it is associated with aortic aneurysm or an extreme hypertension with a high pulse pressure and unless the heart is deficient in reserve, the carbonated brine baths are of benefit. It is a noticeable fact that it is the "doctor's disease" and more than one unfortunate colleague seeks relief at the spas.

Valvular lesions.—Valvular lesions that are fully compensated with an evident sufficient reserve are

not benefited by carbonated brine baths. In such cases it is unjustifiable unless some other disorder complicates matters. This foreword is necessary because there is an impression among the laity and some few members of the profession that the baths will blot out a murmur. This is fallacious. Without considering the pathology of mitral regurgitation it is only necessary to call attention to the physics of the lesion. Because of the regurgitation the left ventricle dilates and hypertrophies. If the demands upon this ventricle are too great it fails to perform its task with a still further dilatation and hypertrophy and increasing the auricular work with a resultant loss of balance between the arteriovenous exchange. In selected cases carbonated brine baths reestablish this arteriovenous balance thereby effecting a decrease of the amount of work and not necessitating such a dilatation and hypertrophy for the function necessary. The excessive hypertrophy is decreased, the excessive dilatation lessened, cardiac nourishment increased and a normal blood pressure reestablished. Cardiac reserve is increased so as to meet the tax of the bodily activities.

In mitral insufficiency, which is only relative, because of dilatation, it is expected that the carbonated brine baths by reducing this dilatation will effect a clearance of the murmur as soon as the leaflets approximate and thereby produce a better function. In mitral stenosis it follows that any therapeutic measure that aims to produce a greater ventricular effort would have an injurious effect upon this atrophied left ventricle, the dilated right ventricle, and the dilated left auricle. In cases in which the stenosis is very moderate the baths if carefully given may be of benefit. In cases of aortic regurgitation in which it is reasonably sure that the dilatation and hypertrophy has not reached its limit and in which a good amount of reserve is demonstrable the baths may be given with caution. Indeed some cases are markedly benefited. In cases with markedly hypertrophied hearts the reserve is usually found to be poor and contraindicates the baths. When aortic insufficiency is due to a relaxed aortic ring one may expect the baths to help in a few cases. When due to syphilitic aortitis, aortic aneurysm, and endocardial lesions no benefit is to be expected. Aortic stenosis contraindicates the baths and as a rule is associated with other conditions, equally contraindicatory.

Aneurysms contraindicate the carbonated brine baths without respect to their location.

Arteriosclerosis and hypertension.—After the age of forty years the most important and the most common pathological disturbance is the continued increase of arterial blood pressure. For a comprehensive view as to the feasibility of the use of carbonated brine baths in this condition the most recent works on the subject are reviewed. The immediate cause of hypertension is due either to an increased output of blood from the heart or an increased peripheral resistance to the blood as it leaves the larger arteries. In early hypertensions it is found that the left ventricle alone is hypertrophied. If the tension was due to an increased output of blood from the heart one would expect a hypertrophy of both ventricles. If the left alone is hypertrophied it follows

that this is due to increased peripheral resistance to the blood as it leaves the larger arteries. This also means that the systemic circulation is under a greater tension, but without right ventricle disturbance the pulmonary circuit is not affected. Only in the later stages of the disease, when the tension is great enough to cause a weakening of the left ventricle or an insufficiency of its valves do we find the right ventricle affected. The left ventricle being alone hypertrophied in the early stages of the hypertension argues that there is not an increased output of blood from the heart and that there is not an increased viscosity of the blood, for both these causes would affect the left and right ventricle equally. Therefore there is no regular or material increase in the flow of blood through the arteries. Since this is true it must be that the hypertension is due to increased peripheral resistance of the flow of blood from the arteries. Arterial changes in the large arteries do not necessarily produce hypertension. It has been shown that at least twenty-seven per cent. of all patients with clinical evidence of arteriosclerosis of the large arteries have either normal or subnormal blood pressures. This is not so surprising when it is recalled that the main resistance is not encountered in the large arteries. Resistance is encountered mainly in the arterioles and capillaries.

The next conclusion is that the arterioles must be sclerosed to produce high blood pressure and the usual definition of such a condition is a narrowing of the lumen with a marked wall change that prevents the arteriole from dilating or contracting. This conclusion is without foundation when one considers that certain organs demand a periodical dilatation so as to receive enough blood to facilitate their function. Added to this evidence is the dilatation produced by the nitrites of these vessels and the tendency that they have to "spasm." The next conclusion is that hypertension is due, not to an anatomical narrowing of the lumen alone, but to a narrowing that is produced in part by an increased tone of the muscle fibres surrounding the arterioles. It is reasonable to believe that in the early stages of hypertension there is but little anatomical change in these arterioles, but after these vessels have been under a constant hypertone it is easily seen that degenerative changes will occur and cause anatomical changes. Capillary pressure is less than arterial pressure because the main fall in pressure occurs in the finer arterioles. Capillaries withstand this pressure because of the small calibre of their lumen; this is explained by a physical law that, at a given internal pressure, the linear tension of the walls of a tube is proportional to its diameter. Any increase in pressure due to arteriolar resistance would subject the capillaries to a greater internal pressure and thus a corresponding proportional dilatation.

For convenience these cases may be divided roughly into three classes: 1, the early cases that show increased arterial tension with a hypertrophy of the left ventricle alone and an increased peripheral tone without any definite demonstrable anatomical change of the peripheral vessels; 2, cases of moderate sclerosis of the peripheral vessels added to the increase of tone, with a hyper-

trophy of the left ventricle, a relative mitral insufficiency, a dilatation of the left auricle, and a tendency to hypertrophy of the right ventricle with slight pulmonary signs of edema at times; 3, cases with definite peripheral sclerosis of the vessel wall that has effected an anatomical narrowing of the lumen thereby lessening their response to physical, chemical, and nervous influences. The tension is high and affects the heart by hypertrophy of the left ventricle with left auricle dilatation, relative mitral insufficiency, pulmonary stasis, and hypertrophy of the right ventricle.

If the physiological action of carbonated brine baths on the peripheral circulation is recalled it is manifest that in the first two classes they would be of benefit. This is especially true of the first class which includes the so called neurogenic blood pressures from wear and tear, the *moliman climacterium virile*. In the first class not only do they check or relieve the process but by increase of metabolic function they eliminate its return until age steps in with its coincident cellular changes that no therapeutic weapon can combat. In the third class mentioned the anatomical changes have so progressed that practically all such cases contraindicate the treatment because of the lack of response of the arterioles.

Functional tests here are not of much value, only as far as the reserve of the heart is concerned. How then are we to determine to a conservative degree of accuracy the extent of anatomical change of these arterioles? Where can one get a glimpse of these vessels that will in a measure determine whether they are fibrosed or not? The ophthalmoscope with which the fundus of the eye can be seen serves the purpose. No examination of a case of hypertension is complete and no prognosis justifiable unless an ophthalmoscopic examination has been made. If the fundus shows an increased tortuosity and beading of the vessels; an increase in the opacity of the arterioles with a widening of the central light streak; an interruption of the continuity of the veins where they cross the arteries and dilatation just beyond this point; white lines along the course of the vessel; retinal hemorrhages; retinal edema near the disc, along blood-vessels, or scattered in spots, the conclusion is justifiable that anatomical changes have occurred and that a degenerative process has to be reckoned with. In almost all of these cases, which usually belong to the third class of cases mentioned, the baths, as has been said before, are useless and if given as routine would often do harm. There are a few of these cases, with fundi evidence of degeneration as well as clinical evidence of generalized arterial sclerosis, in which the blood pressure is not too excessive and in which the cardia has not been too severely affected in which a trial with the baths may benefit. The prognosis of their effect should be guarded as they may produce deleterious effects without any special warning. Benefit is only expected through stimulation of increased metabolism.

In all cases of hypertension it is necessary to be extremely watchful as to the effect of the baths. Daily blood pressure readings, carefully noting the pulse pressure should be made to determine

the brine strength, the CO_2 saturation, the duration, and the temperature of the baths. The temperature fall should be guided by the fall of pulse pressure. Temperatures of 97° to 93° F. are the most favorable and the duration varies from four to fifteen minutes. The CO_2 saturation should be weak and in extreme cases is best omitted. Very rarely is the temperature lowered below 93° F., the indifferent temperature, except in cases in which there is a return to an average so called normal. Personally, the various norms for individuals at certain ages as determined by insurance companies and others influence but little my idea of normality. When the symptoms have disappeared, the dilatation has decreased materially, and the physical reserve approaches its former norm it is then time to fix a relative normal pressure for the individual. It is the function pressure, the one that facilitates the proper adaptation of circulatory efficiency to body demands. If a function pressure is approached, as manifest by the improvement described above, baths of a temperature lower than 93° F. are justifiable, with a corresponding increase of brine strength, CO_2 saturation, and duration.

If the baths cause any untoward symptoms as the so called premonitory signs of cerebral hemorrhage they are to be discontinued. If a cerebral hemorrhage occurs the baths are contraindicated. In the thin, debilitated cases of sclerosis with poor hearts, where the superficial vessels are extremely tortuous, they are contraindicated.

In many cases rest, diet, sweating, and catharsis as a preliminary course of treatment of baths will prepare the patient, if you please, for the proper reactions to the carbonated brine baths. On more than one occasion I have observed in cases of hypertension that upon entrance contraindicated absolutely the baths, yet, after two or three weeks of rest, diet, sweating, catharsis, and sometimes bleeding, the condition of these patients had so improved as to warrant a risk with the carbonated brine baths.

CASE.—One patient in particular, a thin woman of sixty years, had a profound degree of arterial tension and patchy degenerations, a marked hypertrophy of the left ventricle, a dilatation of the left auricle, and hypertrophy of the right ventricle, a fair amount of pulmonary edema, and evidently some slight back pressure on the right auricle, as evidenced by a slight tibial edema, with a slight renal involvement. The physician and the consultant who referred her did so after they had exhausted their therapeutic skill. They felt that she would perhaps have a chance away from home and hospital life that was tedious in the extreme to her. My own conclusions were that she was likely to have a fatal crisis soon. I almost expected her to die, yet at all times she assumed and expressed the most optimistic attitude. Absolute rest, a fairly liberal diet on account of her poorly nourished condition, catharsis, digitalis in moderate doses, and a cold water bag to the heart, were first prescribed. In ten days while her pressure of 240 systolic was not reduced, her diastolic changed from 105 to 120. She gained in weight and in apparent reserve. Later short sweats were given and the pulmonary edema was not so marked. She slowly but progressively regained her compensation to a degree that meant comfort during the day and that allowed continued sleep throughout the night, something that she had not known for months. With this better compensation came a reduction of her pressure to below 200 systolic and 110 diastolic. This required four weeks. The excessive blood pressure at first was in part due to cardiac failure. With

a more efficient compensation, a truer value was found for the part that her sclerosis played in her condition. During this excessive blood pressure several small retinal hemorrhages occurred, but afterward the arterioles presented a good but not extreme amount of degeneration. In this case carbonated brine baths were given with good results, and exercises with dumbbells advised. After a stay of almost four months she returned home able to walk about, assume a moderate amount of responsibility, and enjoyed herself even though she led a simple, non-exciting life. This patient did well for six months when she was taken suddenly ill and soon after the medical attendant made his diagnosis of apoplexy, she died.

This is an extreme case that reacted where perhaps 999 similar ones would have died, yet it serves the purpose of illustrating that our prognoses were limited because of the patient's apparent condition masking the true value of the fundamental pathology. Ophthalmoscopic examination showed what might be termed third degree sclerosis of the arterioles and this was subsequently substantiated by the cause of her death. Yet it is a fact that some areas are more affected than others, this being especially true of the cerebral vessels and the coronary arteries of the heart in people who use their brain rather than their muscle. It is concluded that there was third degree sclerosis of the larger arteries and a second degree sclerosis of the peripheral arterioles with the exception of the cerebral arterioles. This accounts for her reaction to the baths after preliminary measures restored an arteriovenous exchange. In the above consideration, arteriosclerosis, hypertension, and neurogenic hypertension have been mentioned with a reference to hypertension due to cardiac failure. In this last named condition it is essential to emphasize that first of all a compensation must be established by rest, diet, diaphoresis, catharsis, diuresis, and in some cases by bleeding, before carbonated brine baths are indicated. In this condition usually a second or third degree sclerosis is noted.

Cases of so called nephritic high blood pressure, if not complicated, do well at times on plain brine baths at a temperature of not less than 93° F. In lower temperatures an already congested organ is, if you please, supercongested with harmful results. Cases of so called relative high blood pressure, such as is noted in diabetes, syphilis, hyperthyroidism, asthma, and aortic insufficiency, may be helped. If luetic or diabetic, carbonated brine bath helps by increasing metabolism, but in no way does it approach a "cure." Orthodox treatment for these respective conditions are essential, and in persons who can afford it and need a rest besides, the CO₂ brine baths constitute a very helpful adjuvant and effect at times happy results on the cardiovascular system. In cases of hyperthyroidism we may be more hopeful, but the results in these cases are variant, so that their use is only empirical. The asthma referred to in this discussion is cardiac asthma. As a rule cardiac asthmatics are suffering from chronic myocardial insufficiency, associated with arteriosclerosis, nephritis, and hypertension. Its significance is that there is myocardial insufficiency. In this combination carbonated brine baths are usually ineffectual or contraindicated. In one case under observation there was an aortitis (specific?) with aortic dilatation and a relative aortic insufficiency with

asthmatic attacks. Complicating this was a high blood pressure, a moderate degree of arterial sclerosis, and with but small evidence of arteriolar sclerosis with albuminuria and a few hyalogramular casts. During the intervals of attacks the patient felt well and was able to walk comfortably on the level and to assume responsibilities. Carbonated brine baths were carefully prescribed but after a few sances they were discontinued as the attacks increased. Careful sweating and iodide of potassium afforded the best results. Cases of aortic insufficiency causing a relative high blood pressure may be benefited in a few cases. Its pathology and etiology should be carefully looked into before treatment is instituted. In all cases a preparatory period should be advocated so as to study further the condition and to try and decrease this insufficiency. If this is possible and one feels that there is a sufficient amount of myocardial reserve, the carbonated brine baths may be tried. Cases of essential high blood pressure are benefited, especially of the first and second type, and in some few cases of the third type. Of course, as the name implies, it is not complicated and therefore offers a more optimistic prognosis.

Cardiovascular hypotonia.—As a rule this class of patients is the best as far as results go. It matters not whether this low blood pressure is due to a systemic vasodilatation, a weakened heart muscle following the acute infections, vagotonia, or what may be termed cardiovascular asthenia found in neurasthenic and psychasthenic states, these baths if given cold will increase this pressure. Their action is not only peripheral but central, that is, on the heart muscle and its function.

Cardiovascular disorders of the obese.—Obesity does not necessarily produce a weak heart, cardiac inefficiency, or high blood pressure. That it predisposes the heart to these disorders is certain. The inactivity that it engenders, the usual dietary indiscretions to which they are addicted, and the evident disproportion between cardiac size and body size sum up a total that overloads a heart. These patients accumulate a fatty cardiac capsule which once formed is very hard to get rid of; in fact, in reduction it is the last and least to be affected. Besides this the muscle of the cardia is infiltrated with fat and this produces a weakness and loss of tone. In treating these cases one must have two objectives: 1. Reduce the weight of the patient. 2. Tone up the heart muscle with carbonated brine baths. It is not the purpose of this paper to discuss the reduction treatment of obesity, but to point out that it is futile to attempt to procure a result unless the above named objectives are kept in mind. In all cases a correct determination of the functional reserve of the heart is necessary. In suitable cases, because of the lack of time usually, the patient has to bear up under the two stresses of reduction and carbonated brine baths. In a great many instances where one feels that there is but a moderate and limited amount of reserve and where it is deemed inexpedient to combine the two treatment objectives, it is often difficult to decide whether first to reduce your patient or to try to correct the cardiac insufficiency. In the

majority of cases it is advisable first to correct the cardiac inefficiency, and if successful later to combine the reduction treatment with the CO₂ brine baths. As a rule, the usual case of obesity can be safely reduced with diet, graduated exercise, and hydrotherapeutic measures if the cardiovascular apparatus is, so to speak, strengthened by the carbonated brine baths. That the carbonated brine baths lessen the amount of pericardial fat is but problematical, but by its effect of reducing the cardiac size, of increasing its nourishment and rest periods by prolonged systole, by effecting a better arteriovenous exchange, it no doubt influences to some extent the fat infiltration. With a lessening of the body bulk by reduction measures the circulatory demands are less, proportional to the decrease of space to be vascularized. Therefore, a rational obesity cure may be effected without the usual danger that is found in most obesity cures by the use of the carbonated brine baths. While the reduction is gradual, and perhaps after the cure the esthetic appearance of the individual may not be as gratifying to the patient and his friends, but its economic and eugenic value can not be compared with the rapid reduction method, which, in a great many instances fosters cardiovascular disorders. That the gradual reduction method with the promotion of cardiac efficiency by the carbonated brine baths is more stable, substantial, and the most rational is not to be doubted.

Hyperthyroidism.—As stated before in the discussion of hypertension, the results in these cases vary so much that their application is but empirical. In all cases the cardiac reserve must be determined. These cases fluctuate so much that it is difficult to say whether the carbonated brine baths have improved or harmed them. About the time that you make up your mind that results are being obtained by their use, a remission occurs, and this therapeutic stronghold seems to have had its foundation on the sands. In other cases, where other measures have failed, this treatment apparently comes to the rescue and effects a happy result, and credit is given to it, without definitely knowing why it should produce a reaction in this patient when the opposite reaction was obtained in a perhaps similar case. Usually in cases with a myocardial insufficiency and a varying degree of decompensation, if there is cardiac reserve, the CO₂ brine baths are indicated. If the pulse rate is not above 120, and if there is much "nervousness," one is justified in giving the CO₂ brine baths. In such cases they usually produce a quiescent effect with sleep and improve the general condition. If there is marked thyroïdosis, with a rapid, irregular pulse and perhaps a fibrillating heart, the baths are contraindicated.

It is impossible to say what effect the baths have upon the glandular disturbance, and if any of this effect is due to the radium emanation. That good results are obtained by ameliorating the symptoms, however, is a practical experience. Personally, I have never seen a cure and do not believe that such is possible with this measure alone. The orthodox medical treatment is given and the baths are used as adjuvants to promote the cardiovascular effects that have been considered before. Perhaps their

chief use may be in promoting a better nutrition to the heart muscle itself, thus allaying the degeneration incident to thyroïdosis.

Tachycardia.—This symptom, which may occur in sympathicotonic symptom complexes, in the menopause, and in transient endocrine unbalances due either to disturbance of the physiochemical level or the psychic level (cardiac neurosis), or a combination of both of these levels, are most usually greatly benefited. In the sympathicotonic tachycardias usually associated with vasoconstriction as seen in the peripheral anemias, dry skin, dry hands and feet, and a relatively high blood pressure, it is readily to be seen that by reducing this peripheral vasoconstriction it would relieve the heart of what may be termed a circulatory demand reflex, and thus ameliorate or eliminate this symptom. Of course, the pharmacodynamics of sympathicotonia must be kept in mind and used, and by combining these two therapeutic forces this symptom complex can be successfully combated.

In the menopause where there is what may be called a vasomotor ataxia—that is, vasodilatation then vasoconstriction and tachycardia—it is obvious that the carbonated brine baths by increasing the tone of the cardiovascular apparatus will allay these unpleasant vascular pranks and make the patient comfortable until a new endocrine and physiochemical level is established with its proper adaptation to the change brought about by nature. The same holds true for disturbances of the physiochemical unbalance due either to intoxications or to psychogenic factors or a combination of both, but we must not forget that intelligent handling of the psyche of these patients will greatly enhance the effect of the baths. Indeed, many of these tachycardias would yield to neurological and psychological treatment alone, if properly applied. If these tachycardias are due to intoxications it is futile to apply the baths alone without trying to remove the etiology, but they are quite effective in restoring a cardiovascular harmony after the etiology has been eliminated. The baths should never be given during attacks of paroxysmal tachycardia, no matter what the cause may be.

Spiral Fractures of the Tibia.—Charles Davison (*American Journal of the Medical Sciences*, March, 1918) reports three cases of spiral fractures of the tibia, which are produced by torsion and bending of the leg, and are always accompanied by fractures of the fibula. Spiral fractures are more common in the tibia than in any other bone, and constitute fully one-seventh of all fractures of the tibia shaft. He maintains that treatment of spiral fractures of the tibia by external reduction and external immobilization usually result in imperfect union of the fragments with defective function of the leg. Treatment by open operation and autoplasmic repair, on the contrary, usually result in early good anatomical union of the fragments with restoration of the strength and function of the leg. The autoplasmic transplantation of bone in the repair of a recent spiral fracture of the tibia is a capital operation, which requires careful technic, capable assistants, and aseptic surroundings.

THE CORRELATION OF THE DIAGNOSTIC AND THE MUSICAL EAR.

BY CYRUS HAMLIN, B. S., M. D.,

New York,

Clinical assistant, New York Post-Graduate Medical School and Hospital.

Although the modern clinician has at his command valuable aids in diagnostic procedure, such as the x ray, the microscope, which covers the immense field of bacteriology, hematology, etc., nevertheless, what are commonly designated as the physical signs, inspection, palpation, percussion, and auscultation have not yet been supplanted. Their availability and the correct interpretation as to findings when used skillfully, render them fairly reliable; otherwise, they would be cast aside for superior methods, which have not yet appeared on the medical horizon.

Proficiency is attained by plenty of practice; there cannot be any dispute on this point. In auscultation and percussion, however, two most important physical signs in the writer's opinion, there is one other important basic factor, aside from plenty of practice, that has not been fully considered. Does every medical student or practitioner possess what might be termed the diagnostic ear? Can he, like the skilled musician, discriminate pitch, which is an essential in diagnosis?

The personal opinion of the writer is decidedly in the negative. It is a well recognized fact that many individuals cannot catch a tune or keep on the key; this is certainly not to their discredit. It is not unreasonable to assert that there are many in the medical world with the same deficiency, viz., pitch deafness.

One prominent clinical teacher, in a large New York medical school, has made the statement, not publicly, that in his experience only one in about twenty students is capable of recognizing pitch. This seems a rather low proportion, but there must be some ground for his assertion. The diagnostician has a harder task than the musician, for he is dealing with a noise that is not clean cut and in many cases in diseases of the respiratory tract the sounds are almost inaudible. On the other hand, the musician must first be a pitch specialist, he must catch the correct intonation and then deliver it to his audience, who are his judge and jury.

For the past year the writer has adopted a procedure in percussion and auscultation which is original as far as he can ascertain. It consists of converting the pitch of the sound obtained through the above physical signs into its equivalent in a musical note. The term "corroborative auscultation and percussion" has been suggested to designate this procedure. It is not contended that ultrafine discrimination in pitch is necessary to diagnose all the respiratory diseases of the chest. Such terms as resonant, hyperresonant, cracked pot, and tympanic define the quality of the sound but tell only half of the story, the pitch of which is usually designated as high or low. To one possessing a discriminating ear this is not exact enough. Furthermore, in percussing the apices of the lungs in a stout subject with deep chest and large bronchi and alveolar cells, the actual pitch is lower than that of an individual of just the reverse type, yet no patho-

logical condition may exist in either case. Here we should not generalize too much, but individualize each case. For a sound rock basis the true pitch should be ascertained and recorded. Corroborative percussion is most applicable in the diagnosis of incipient tuberculosis at the apices of the lungs. On percussing over the clavicles of a normal subject the pitch, when translated into a musical one, differs by half a tone; a greater variation than this should be regarded as suspicious and kept under observation.

At this point I cannot refrain from making a digression. I believe that the man who does not make use of all the physical signs, examination of sputum included, in their proper sequence in a patient, who has a cough that has persisted longer than a week or two or who has an unaccountable loss of weight, anemia, huskiness of the voice, unusual brilliancy of the sclerae, in women diminished or suppressed menstruation, rigors or chills, flushing of the face, or light fever toward evening, is more guilty of malpractice than he who fails to practise Credé's law in the newly born. In one case, the misfortune is confined more or less to the individual and his or her immediate relatives, while in the other, the community, the town, the State, the country, the whole world suffers and will continue to until more exact methods are discovered by which incipient phthisis can be diagnosed at its inception, so that, first, proper treatment can be instituted at once, and, second, the patient may be isolated for the protection of the community.

The public should be made to realize that it is to their advantage to have every man, woman, and child consult a skilled diagnostician at least two or three times a year to exclude incipient tuberculosis and cancer, for in no other way at the present time can these scourges be dealt with satisfactorily. Furthermore, if the public do not take kindly to this form of education, drastic laws should be passed compelling them to do so.

What a strange thing human nature is! Most intelligent people have sense enough to consult a dentist twice a year to be bored half to death and are willing to pay well for it. Of course the lungs are not so important as the teeth! Returning to the subject at hand. In the first stage of a tuberculous process of the lungs and in the various pneumonic conditions, the pitch on auscultation and percussion is more or less deterministic in value, but who can recall it even after a few moments have transpired? Like the greased pig, some can catch him, but who can hold him? Even the most skilled violinist dare not trust to memory, as to whether his instrument is correctly tuned, hence, before each selection is rendered the corroborative note is obtained from some other instrument whose pitch is stable.

As in tuberculous conditions, so it is with diseases of the pleural cavity, with or without effusion. In case of the former lesion, characterized by inflammation and hyperplasia of the pleura, the dullness equivalent in a musical pitch averages two notes lower than that of the normal side, while in pleurisy with effusion the pitch is four to five notes lower. As a corollary, it follows that the pitch is grad-

ually raised until it comes within a half tone of the normal, where it remains stationary for some time.

In cases where bronchiectasis, gangrene, or abscess is engrafted on the original lesion, I have found corroborative percussion of great assistance in diagnosis. Not only must the presence of dullness be determined, but the extent and amount must be ascertained. It should be accurately measured for future reference. The sense of hearing is the most deceptive of the special senses. Careful practitioners find it quite safe at times to resort to the tape measure for a suspected shortening of a limb or the difference in circumference of the same. Who is there at the present time who will trust to his sight for the shade of the color of the blood of his patients suffering from a hemic disease? He consults his hemoglobin scale if he is progressive and has any respect for exactness. One medical friend has facetiously remarked: "Having got the patient's number the only thing that remains now is to get his note." If we have found it useful to keep a permanent record of what we see, why does not the same principle apply to what we hear?

As a description of the procedure and instruments used in corroborative auscultation and percussion would make this paper too long, I shall defer it. Suffice it to state here that the ear has to undergo special training in order to catch the pitch of sounds that are elicited on percussing the various viscera and structures of the human body.

The question will undoubtedly be raised: What about the laboratory tests? Is not the presence of the tubercle bacillus in the sputum conclusive? It certainly is if found, but in incipient tuberculosis and at times even in the late stages, it mysteriously disappears and no satisfactory explanation has been given. In too many cases, its discovery is too late, as the silent and tragic death statistics reveal. Quoting from Arnold Lorand's *Building Human Intelligence*: "A physician, particularly, can never see enough, and no matter how old he becomes and how much he has traveled, he should always find something new to add to his store of knowledge. Moreover, for the medical profession which requires absolutely the highest qualities of intelligence, acuteness of all the senses is simply indispensable and these can be best developed by much traveling, seeing, and comparing."

Finally, in order to obtain the musician's opinion as to the correlation of the diagnostic and the musical ear, one of the most distinguished foreign artists, Mr. Fritz Kreisler, the violinist, was appealed to. Since he actually studied and practised medicine his opinion is of double value. His letter is as follows:

SEAL HARBOR, ME., June 19, 1916.
Dear Doctor Hamlin:

Your kind letter was in many respects extremely interesting to me. There is no doubt that there is a strong relation between the trained ear of the diagnostician of diseases of the respiratory organs and the commonly called musical ear, and that experience in auscultation and percussion tends to make medical students apt to distinguish between musical sounds.

I remain with kindest regards,

Very sincerely yours,

Fritz Kreisler.

102 HANCOCK STREET, BROOKLYN.

SEPTIC CELLULITIS.*

Report of a Case.

By RAMON D. GARCIN, A. B., M. D.,

Richmond, Va.,

Ex-President of Richmond Academy of Medicine and Surgery;
Fellow of the New York Academy of Medicine.

CASE.—On October 17, 1916, I was called to see Mr. P., white, aged forty years, a painter, who gave the following history: About ten days previous he had scratched the little toe of his left foot while at work. No attention was paid to this slight injury. A faint redness appearing, a domestic remedy was applied; when it did not improve I was called. On examination I found the foot swollen, the redness extending to the knee. The patient was septic; temperature, 102.5° F.; pulse and respiration proportionally rapid. I ordered hot local applications of full strength Burrows solution, calomel, and a saline purge. On the next day the symptoms were worse and the redness more marked, extending several inches above the knee. Local applications were continued and iron, quinine, and strychnine in large doses were ordered. This treatment was continued for several days, with the addition of local treatment with fifty per cent. ichthyol. The patient continued to grow worse, temperature rising to 105°, and the superficial skin below and above knee began to slough. No improvement being noted, with treatment as outlined, and fearing the patient would lose either limb or life, I decided to use mixed infection, phylacogen. On October 30th I gave ten minims subcutaneously, and on the next day, seeing no improvement in the condition, I doubled the dose. There was still no amelioration of the condition, local or general, and fifteen minims were administered intravenously. This was followed by some reaction, the temperature rising to 106°, followed by a drop to 101°. The dose was repeated, giving fifty per cent. more than on the first day. This was followed by slight reaction and then a drop to normal, with slight variation remaining normal. There were two large sloughs, one below the knee downward, about one and a half inches in width by six in length, and one above the knee on the anterior aspect of the thigh, three inches wide by eight long. These healed slowly. Hot normal salt solution, saturated solution of epsom salts and scarlet R. were among the numerous applications tried. The slough on the thigh was so extensive that it appeared at one time skin grafting would be necessary.

The interesting points in this case are: 1, the rapidity and extent of surface involved; 2, failure of usual treatment; 3, prompt response of the intravenous medication; 4, complete and permanent recovery, patient having been at his usual vocation since early spring.

Syphilis of the Lung.—H. Lisser (*American Journal of the Medical Sciences*, March, 1918) reports seven cases with roentgenograms, and concludes that syphilis of the lung is uncommon, but not extremely rare, and is worth diagnosing correctly, though it does not produce a typical clinical picture. He says that there are really but three points in the diagnosis that seem to be of any help: 1, The absence of tubercle bacilli on repeated examinations; 2, the curious lack of proportion between the gravity of the physical signs, the severity of the symptoms, and the astonishingly good appearance of the patient; 3, merely bearing in mind in the examination of every suspected pulmonary tuberculosis that there exists such a curable lesion as lesions of the lung. A Wassermann test, whether positive or negative, is not conclusive, but proper antisyphilitic treatment produces, remarkable cures.

*Read before the Richmond, Va., Academy of Medicine and Surgery, December 11, 1917.

Medicine and Surgery in the Army and Navy

AN INSTRUCTION CORPS FOR MEDICAL
RESERVE OFFICERS AND CADETS.

*A Practical Test.**

By CHARLES E. DE M. SAJOUS, M. D., LL. D., Sc. D.,
Philadelphia.

You will doubtless all recall what Mr. Herbert Hoover, our present food commissioner, did for the Belgians and for the inhabitants of Northern France. His work has cast an everlasting halo around the American flag, more beautiful and glowing than any great victory. What it has meant was fittingly summarized but a few days ago by King Albert of Belgium, when, in a Christmas message to the American people, he said: "Without the generous support and kind aid of the American people, the people of Belgium would have been starved to death."

There is considerable analogy between Mr. Hoover's work in Belgium and that entrusted to the Surgeon General of the United States Army, as the guardian of the exposed lives of our troops. If the war is to be fought to a successful finish, men as numerous as the whole population of Belgium will probably be sent abroad. And it is upon the efficiency with which their injuries and diseases will be treated and preventive measures against disease carried out that the lives of multitudes of them and, in fact, the success of the war itself, will greatly depend.

What medicine has done to alleviate human suffering incident upon war and to ensure successful results is well illustrated by the appalling conditions that prevailed formerly. During the sixteenth century, for instance, Ambrose Paré ordered his assistants to "sweetly cut the throats of such as are seriously wounded, so as to end their sufferings." As to the ravages of disease, they were at times such as to ruin an entire campaign. Colonel La Garde (1) recalls that in the Walcheren expedition against Antwerp, in 1809, the Earl of Chatham's army of 42,000 men was reduced by death and invalidism in three months to 6,749 men, who were then withdrawn. While disease itself had killed 8,400 men, but 206 had been destroyed by the weapons of the enemy. The French Campaign of 1802 in San Domingo met with a similar disaster through the destructive effects of yellow fever, malaria, and dysentery. The deaths were so numerous that reinforcements could not arrive in time to compensate for the losses, and hardly a man ever returned to France. In the war between Russia and Turkey in 1878, a Russian army 100,000 strong left 85,000 dead from disease in the latter country.

Conditions were but little better during modern campaigns, long even after bacteriology, due to the immortal Pasteur, had opened the way to present day possibilities. Our war with Spain, as late as 1898, was attended by deplorable conditions. "Here," writes Prof. James Ewing, of the College of Physicians and Surgeons of New York (2), "pestilential disease broke out in violent epidemic

form in all the camps; malaria and dysentery more than decimated the troops in Cuba, who were saved from annihilation by these diseases and yellow fever, only by prompt removal from the danger zone." In the British Campaign in South Africa, which lasted from 1899 to 1902, sickness was responsible for the loss of 86,000 men by death and invaliding.

Fortunately, matters have changed during the last fifteen years, and having entered late in the fray we will learn much from our allies. The recent occupation of Vera Cruz, a notorious hotbed of yellow fever, smallpox, and typhoid fever, illustrated the progress made. Even though our troops remained seven months in this tropical, ill kept town, not a case of these dread diseases developed. The general death rate, 3.9 per thousand, in fact, remained below what it would probably have been in any of our own cities, so carefully was the sanitary condition of the troops supervised by the officers of our Army Medical Corps. Indeed, it is mainly through this corps that one of the greatest of the scourges mentioned, yellow fever, has been eliminated; the labors of Reed and Carroll, who demonstrated the rôle of a particular mosquito as its means of transmission, stand among the most brilliant scientific demonstrations ever recorded. Practical results were soon attained. Our present Surgeon General, then Major Gorgas, Chief Sanitary Officer of Havana, freed that city of yellow fever for the first time in 150 years, and subsequently, as you well know, made one of the healthiest areas on earth out of that plague spot, the Isthmus of Panama.

Typhoid fever has also been mastered as a deadly peril to troops in recent years. Following methods of vaccination introduced in 1888 by Chantemesse and Widal, of Paris, and developed by Sir Almroth Wright, of England, in 1896, Major T. F. Russell, of our army, began in 1909 vaccinating our troops, and so successful has this means of prevention proven itself that the occurrence and mortality from typhoid fever may now be said to have been practically eliminated.

When we come to newer conditions of today, up to date knowledge again asserts its importance. The enormous use of artillery and of high powered explosives, the introduction of grenades, poisonous gases, projected flames and other horrors, have converted the modern battlefield into a veritable inferno. And yet of the ninety-four and odd per cent. that are not killed outright, over eighty-six per cent. are saved by modern methods, even though new weapons produce new types of wounds, and high explosive shells cause terrible and widespread mutilations, driving into the torn tissues, germ laden soil, fragments of soiled clothing, skin, etc., to contaminate them; though multiple wounds by shell fragments, shrapnel, gravel, and foreign bodies of all kinds are usual; and badly wounded men frequently lie hours and even days in no man's land in fields literally sodden with tetanus and other germs.

We owe this to the discoveries, so to say, of yesterday. In the early days of the war, antiseptics was inefficiently carried out, but thanks to a wise

*Inaugural address delivered to the Medical Reserve Cadet Corps of Temple University of Philadelphia, January 5, 1918.

return to the principles of Lister, a new era, inaugurated by Dakin and Carrel, has been wrought. To prevent infection had been Lister's plea; to reach the infected area, eradicate it or master its morbid contents—defeat, in other words, that which in former wars had thwarted the greatest skill, became the aim of Dakin and Carrel, so marvelous in its results as to approach the miraculous.

Need I urge that the man who today dons the uniform of a military surgeon requires special up to date knowledge to assume the vast responsibilities that a sudden tidal wave of wounded may thrust upon him? In truth, even a good, modern medical education affords but a foundation for military knowledge that will keep the mortality of our troops down to the lowest level of modern possibilities. A man who accepts a commission in the army nowadays should feel that he is doing his duty only when, with patriotic humility, he buries his pride, and so familiarizes himself with newer methods as to enable him to feel that the wounded and ill entrusted to his care will *all* be returned to their families if up to date knowledge will afford him the means.

Need I state that I am but summarizing the aims of the Surgeon General? We have seen what the name of Gorgas has meant to sanitary science. Events have already shown that just as God had given us the right President for this hour of great trial, so has He given us Gorgas to heal the millions of patriots entrusted to his care. We have not only the Army Medical School in Washington, but large training camps where Reserve medical officers from civil life receive military training. Only last June, referring to these camps, a distinguished medical officer, Colonel E. B. Vetter, wrote (3): "The task the medical officers of the regular army must now undertake in this connection, besides numberless demands upon their time and strength, will be the organization and administration of schools with students more numerous than the combined student bodies of Yale and Princeton, while the faculty will be numerically far smaller. The problem is a stupendous one and in its solution the Medical Department is entitled to the sympathy of the entire profession." Since these lines were written, the value of these training camps, thanks to the untiring efforts of our regular medical officers, has been fully demonstrated, and already thousands of intensively trained officers from civil life are rendering valuable services.

Difficulties are looming up in the horizon, however, which may need not only the sympathy of the medical profession, so freely vouchsafed, but perhaps effective aid. It is an effort in this line, on the part of all the medical schools of the country, that is humbly suggested in the present address. Colonel Vetter also wrote in the paper previously quoted: "It will not be possible to send all of the newly commissioned medical officers to the designated camps of instruction; not a few of them must at once be assigned to service with troops who will require their professional services, irrespective of their lack of knowledge of the military environment. The training of such officers will have to be systematically done under the supervision of the responsible medical officer of the command who doubtless will almost always be a trained man."

Can this form of training be successfully carried out? An affirmative answer may be given with regard to the present preliminary or preparatory period, and as long as the operations at the front will not impose too arduous duties upon the Army Medical Corps. But will the period of active operations not modify the whole situation, and tend seriously to compromise the results—which here might entail a great sacrifice of human lives?

We often hear, nowadays, of a National Army of five million men. This would mean, according to the modern ratio of ten medical officers per thousand men, 50,000 medical officers from civil life! In itself, it seems to me, this vast aggregate introduces difficulties which even training camps can hardly solve. Granting the excess over and above 15,000 physicians already commissioned, that is, 35,000 can be obtained, we must not forget that those already in the service represent a large proportion of our younger men, men well prepared by a modern medical education to acquire readily all recent innovations, besides the essentials of military medical science.

Can we hope for equally satisfactory results for the 35,000 still to come? The recent dismissals from the Army of nearly 3,000 medical men who were either physically or temperamentally unfitted for military duties, inadequately prepared, unable to grasp the newer knowledge, etc., points suggestively to the fact that gradually, as the country will be combed for medical officers, deficient men of this class will become increasingly numerous. Those of us who have been teaching two or more decades and who have had much to do with progressive literature, know better than even an officer of the Army Medical Corps the actual status of the medical profession in respect to the evolution of learning. None is more earnest, more sincere, and more successful in the general routine of daily work than the average American practitioner; yet it is only within the last decade that all medical schools have given their students adequate preparation for advanced work, and if it had not been for their own diligence and their systematic study of medical literature, the graduates of such schools, some sixty of which are no longer in existence, could hardly have stood the competition of their better prepared brethren. The standard of efficiency of medical officers necessary to insure the safety of our troops abroad demands more, however; it demands a class of knowledge that was not given to those officers, and that most of the graduates of the best schools even, in respect to hygiene, close laboratory analysis, etc., have dropped by the wayside.

Briefly, it is safe to predict that a large proportion, probably one half, of the 35,000 reserve officers which, after hard work, will be garnered from all the States of the Union at enormous trouble and expense, will fail to meet the needs of the Surgeon General, and, perhaps, in the end, entail a shortage in the supply of medical men at the front.

How can so calamitous a result be prevented? How can the Surgeon General be so aided in his efforts not only to obtain Reserve medical officers, but such as would enable him to carry out his aims with the maximum of efficiency?

It is the seed, so to say, of an attempt in this

direction that Temple University is inaugurating today.

A distinguished officer of the Army Medical Corps, Captain (now Major) Ashford, who has saved hundreds of thousands of lives through his study of hookworm disease, hardly two years ago wrote: "The proper place to commence the instruction of medical men for military emergencies is the medical school," and advocated the formation of Medical Cadet Corps very similar to our own. Major Franklin H. Martin, of the Medical Council of National Defense, also urged recently in an address at the Philadelphia Medical Club that universities should aid the Medical Department of the army in every way possible. We have, therefore, expert and official sanction for the employment of medical schools as a part of the great sanitary machinery which this terrible war demands.

Conceived last winter, and before our country had become directly involved in the war, our course aimed only to add to the curricula of the schools of medicine, dentistry and pharmacy, not much more than the elements of military science and sanitation. Our entrance into the war having increased the urgency of the country's needs, however, the military course, thanks to the patriotism of our trustees and faculties, was not only made obligatory, but so amplified as to enable us to endow our 500 students with useful special knowledge should the Government need their services.

Temple University, as you can see by the multitude of stars in her service flag, has contributed her full share to the army and navy. Over one hundred of the young men in this hall today will before long, we hope, be reserve officers. It is in their honor, in fact, that the name of the corps has been changed since the war began, to that of "Medical Reserve Cadet Corps of Temple University." The very needs of the army, however, and the patriotic response of our faculties have deprived our teaching staff of the valued aid of Major W. Wayne Babcock, Major Frederick Waage, Major W. Hershey Thomas, Major John D. McLean, Major Charles A. E. Codman, Captain D. J. Donnelly, Lieutenants Asnis, Hewson, R. T. Devereux, J. H. Clark, Bradley, Felderman, Benedict, Arnett, and also of Lieutenant H. C. Boyle, recently seriously wounded at the front; while any moment we may lose the valued services of Captain C. N. Russell, Lieutenants Astley, Freeman, Dorsett, Martin, and Oliensis. So great is the threatened drain, in fact, that we wonder sometimes whether the Government is not overlooking the urgent appeal of our British colleagues, based on disastrous experience, that our medical schools be not paralyzed by drawing too heavily upon their teaching staff.

Carefully nursed by the Government, the eighty and odd medical schools throughout the United States could now be used as military educational centres which would solve many difficult problems, economize many millions of dollars, and what is more important, through the larger number of such institutions available, and their clinical and laboratory facilities, increase the speed with which well trained officers could be rendered useful.

It is here that the plan of which our Cadet Corps represents the germinal nucleus, becomes applicable.

We have seen that 35,000 physicians will probably be required. The 3,000 medical students whom our schools graduate each year suggest aid in this direction, but the yearly wastage at the front through sickness, wounds, death, and other intercurrent conditions, will probably reach this number. Our schools, therefore, will not, except perhaps at first, reduce the needs of the moment, and 35,000 reserve officers will still have to be supplied by the general profession. Granting, however, that they are procurable gradually as our National Army is increased, a careful pruning will increasingly be necessary in view of the very marked variations in education and efficiency among medical men, due mainly, we have seen, to the rapid evolution of our medical schools.

The system now in vogue, owing to the steadily increased elimination of incompetents imposed by the vast number of men to be examined, cannot but entail a very considerable and also steadily increasing financial loss. It must be admitted also that to appoint as medical officers after a cursory physical and scientific examination, physicians who have in many instances abandoned lucrative practice, then drop them, though inevitable so far, may entail great hardship. Their appointment is published far and wide; they are sent to camps, and then sent back home with statements in the lay press referring to their "mental incapacity, temperamental unfitness, laziness, inability to command, lack of education, or proper training"—which may have serious consequences for them and ruin their career. These remote effects, certainly not at all desired by the Surgeon General's office, cannot but deter many other physicians residing in the same district from offering their services to the country.

As regards the waste of funds that perpetuation of the present system would entail, it applies mainly likewise to the men who have to be discharged. The expensive equipment of an officer, his traveling expenses, the three months' salary and incidentals during his training period, besides his proportionate share of the outlay for the building of barracks, etc., which probably aggregate at least \$2,500 per man, are fully warranted when the officer is to be retained. It is an absolute loss if he is to be discharged. A preliminary process of selection is needed to prevent such men from ever reaching the training camps. The medical schools, distributed pretty evenly throughout the most populous States, and, therefore, within easy and inexpensive reach of all, are admirably organized to carry on precisely the process of selection needed. Not only could they carry on perfect physical examination, but the professional examination as well. Indeed, they would save many physicians for the army that would otherwise be discharged; for their laboratories, their clinics, their lectures would afford opportunities for improvement in directions found wanting, and a post-graduate course which no training camp, at best a temporary expedient, could possibly offer. As the applicant would only be detailed to take the course (and be examined incidentally) before receiving a commission, there would be no question of discharge and disgrace unless he chose himself to publish the refusal of his services.

Under the absolute direction of the Surgeon Gen-

eral, such a service, added to our medical, dental, and pharmaceutical schools, and without in the least interfering with their current work, could readily be made to serve implicitly his needs, only such men being recommended to him for final decision as would physically and professionally be of real service, after one month's intensive training and examination by the school.

As regards economy, granting for the reasons already given that 35,000 physicians will still be needed, we must count, owing to the gradual increase in unfit and incompetent candidates, on at least one third rejections. In other words, the eighty schools would have to examine 52,500 men, or about 650 men apiece, and send 17,500 home. This would represent an economy for the Government, based on the \$2,500 per man who would not be sent to a training camp, and allowing an average of \$500 for the test course, including traveling expenses, of \$35,000,000.

Another source of economy would be in the time which accepted officers would subsequently have to spend in training camps, since the entire scientific course could be given in the colleges by men specially trained by the Surgeon General's Office for the purpose. Better pupils could hardly be found than the members of the teaching staff, each of whom is a specialist in the line he would have to teach. Even the essential military subjects could be readily acquired, particularly by members of the faculties who may have had military experience, if military instructors could not be spared by the Surgeon General.

One additional month's stay in a training camp for practical work, demonstration of trench systems, field maneuvers, ambulance work, war games, equitation, paper work, etc., after the college training, would then fittingly prepare the medical officer for excellent work.

To give due dignity and a fruitful status to the college faculties entrusted with the work outlined, and to enable them to enforce the discipline that such a course demands, they should be organized into a special corps termed perhaps the "MEDICAL RESERVE INSTRUCTION CORPS." Our Cadet Corps with its nine companies, each representing the sanitary corps of a regiment, and in the aggregate constituting the sanitary organization of an infantry division, has so far met all needs. The military, administrative, didactic, laboratory, and clinical work would be carried on by thirty-two members of the various faculties, who would devote most of their time both summer and winter, as long as the war should last, to the work, each course lasting one month aggregating 192 hours of tuition and being given to sixty-five men at a time. This teaching staff would be paid at whatever rate the Surgeon General would decide, but, even if they received full pay, each of the colleges would cost per year, allowing each institution \$50,000 for necessary equipment and \$25 per man trained, besides an average of \$237 for his traveling expenses and board. An economy of thirty-five millions per year previously mentioned, would be thus realized, to say nothing of the sum saved through the fact that the present training camps would not have to be enlarged.

On the whole, all financial waste would be avoided, the training course would be shortened, the men would probably receive a more complete clinical education, owing to the great amount of clinical material available in hospitals, outdoor clinics and laboratories governed by college faculties, and of greater importance than all, under no condition would it be necessary to send untrained medical men to the front.

All this could be accomplished, moreover, without interfering in the least with the work of the medical schools, while giving their students the military medical training so important a factor nowadays. The public at large would also be benefited by the plan, since the physicians sent back to their homes after an intensive course of one month, would have learned many new diagnostic and remedial measures of great benefit to the lay patients under their care.

An additional advantage would be that it would put to active and very profitable use, many physicians who cannot volunteer because they have exceeded the age limit. This should include, in all fairness, those beyond retiring age whose retention as competent teachers by medical schools proves their efficiency, and whose status in the army as teaching officers would correspond with that of retired officers reassigned to duty for the duration of the war. It would also permit the use of teachers unable to serve owing to physical defects, a too ample supply of offspring and other vital fetters, and of the many other able men who as teachers in medical schools cannot be spared. The income of many would, through sacrifice of practice, have to be reduced to Government pay, but this would breed more pleasure than regret to many who now chafe under their inability to render service, and who look, as Major Coe has eloquently put it, "with longing eyes to the fields of France."

Our medical men throughout the country are undoubtedly going to do all that is possible to contribute to the humane end to be attained. Yet are we sure to obtain the 35,000 high class physicians we need? No chance must be taken in an issue involving human suffering. Our dental colleagues have clearly defined duties as surgeons, but they could extend their field to limits beyond these, a step which the increasingly high standard of their scientific education warrants, and assume by the side of the medical officer many scientific responsibilities which would relieve him for other duties and increase the time spent by him at the bedside. Temple University will give its dental students special training to further that end. Pharmacists are also capable of taking up much of the work which, though necessary, requires time that the surgeon could devote directly to the wounded and sick. Our pharmaceutical students will also receive a special course with that end in view. They have abundantly shown their anxiety to aid, and we believe, judging from the expressed opinion of Surgeon General Gorgas, that their devotion will earn the rank in the newly created Sanitary Medical Corps that adequate scientific preparation warrants.

If other universities, medical, dental, and pharmaceutical schools do as we are doing, even a deficit of 10,000 medical men from the 35,000 needed

would probably not be felt at the front. Particularly a dearth of medical men be prevented if, utilizing these vast teaching plants throughout the land, the Army Medical Department were to create a Medical Reserve Instruction Corps out of their faculties.

Finally, in pleading for support on the part of all concerned with our work, let us urge upon you, as animus for unlimited effort, that which Colonel Goodwin, of the Medical Corps of the British army, wrote recently: "For the sake of your husbands, your sons and brothers going to France, see that your army has an ample supply of medical men; if there is any shortage, the amount of suffering and loss of life will be appalling."

2043 WALNUT STREET.

PRESENT STATUS OF THE PATHOLOGY OF THE PARATYPHOIDS.

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As considerable advance has been made in France during the war on the subject of paratyphoid A, I propose in this letter to outline the present status of the pathology of this infection, viewed from the researches carried out in the military hospitals of Lyons, Grenoble, and Chambéry.

The pathology of paratyphoid A has been rather indefinite because autopsies have not been many, the mortality varying between two and three per cent., and because many reported cases do not indicate whether they were of the A or B variety. The epidemics of paratyphoid which have occurred since the beginning of the war have resulted, however, in a certain number of autopsies, so that some light has been thrown on the existing lesions. These I shall consider as they occur in the various systems.

Lesions in the mouth are those of ordinary angina and ulcerations which, I would point out, are quite the same as those found in the intestine. The stomach is hardly ever the seat of any pathological change and the most important lesions are unquestionably those arising in the small gut. They are from simple congestion and diffuse catarrhal inflammation to tumefaction of all the lymphoid organs of the intestine, follicles, Peyer's patches, mesentery lymph nodes, ending in intestinal ulceration and even perforation, quite like the ulcerations of typhoid. Lesions in the small intestine are always seated in the latter portion of the ileum, particularly in the last ten to fifteen centimetres and ileocecal valve. Occasionally they stop abruptly on the free border of the valve so that the cecal aspect is perfectly free from any change.

Diffuse catarrhal inflammation of the small gut has been frequently noted. In two instances there was an intense congestion, with an hydragene tint of the last metre of the ileum. Peyer's patches did not appear to be involved more than the other structures of the gut. Over the entire surface of the mucosa there was a real eruption of whitish granulations,

particularly marked at the terminal portion of the small gut. Tumefaction of the lymphatic structures, without ulceration, has been observed by many. In one case, particularly in the region of the ileocecal valve, Peyer's patches were marked by a slight elevation and a rosy tint without ulceration. In still another case, the ileum was particularly congested at its terminal portion. Peyer's patches and follicles were distinctly involved in the remainder of the small intestine, but were not ulcerated.

Histologically, the intestinal epithelium had disappeared from the surface of Peyer's patches, this being probably due to cadaveric change. Taken altogether, Peyer's patches were injected and congested, while at some places they seemed to be the seat of an inflammatory process. True nodules composed of lymphatic cells heaped up together were seen, but the process never went so far as necrosis. The vessels of the submucosa were engorged with blood. Changes in Peyer's patches are neither constant nor marked and they are always accompanied by lesions of the mucosa. These consist of small projections the size of a lentil with a depression in the centre and are formed by isolated hypertrophied follicles, giving a diffuse granular appearance to the last few centimetres of the ileum. Peyer's patches as well as the isolated hypertrophied follicles may give rise to ulceration, some having been found in the terminal portion of the small gut which were absolutely identical with those observed in typhoid. In one case a single Peyer's patch was found ulcerated but undergoing cicatrization.

Some observers have noted a psorenteric state in the last thirty centimetres of the small gut with erosions resting upon small projections of the mucosa, probably formed by isolated tumefied follicles, the size and diameter of a lentil. In one case nine atonic ulcerations were found in the terminal portion of the small intestine. Other observers have found small erosions four to five millimetres in diameter with a clean cut punctured border in the hypertrophied isolated follicles. In only one autopsy out of nine were infiltrated, soft Peyer's patches found, but usually, if they were ulcerated, they assumed the dimensions and characters of isolated ulcerated follicles.

The ulceration of Peyer's patches or follicles may be sufficiently deep to lead to perforation. The first autopsy done on a case of paratyphoid A with intestinal perforation is probably that of Grattan and Wood, reported by Bainbridge. The perforation occurred in a single ulceration. Peyer's patches were not markedly hypertrophied, but the terminal portion of the small intestine offered evidences of inflammation. Grenet and Fortineau noted seven ulcerations in the small intestine and one perforation which had been situated in the rectum. They operated on—thirty centimetres above the cecum. In one case Bourges found numerous ulcerated Peyer's patches, and some follicles likewise ulcerated, in the terminal portion of the ileum. Twenty centimetres from the ileocecal valve there was one perforation with two other small ones a little farther on in the gut. In another case there were some ulcerated Peyer's patches in the small intestine and a punctiform perforation fifteen centimetres from

the valve. The peritoneum contained an abundant fecaloid purulent exudate.

Many observers maintain that the large intestine does not present any pathological changes. Some have simply noted congestion of the cecum or congestion of the appendix with erosions. In one case the sigmoid flexure and rectum were found to contain some deep, red ulcerations varying in size from a ten cent piece to a silver quarter, having the aspect of amebic dysenteric ulcerations. I would add that the patient gave a history of two typical attacks of dysentery. According to several observers these dysenteriform lesions are characteristic of paratyphoid A and out of nine cases lesions of the large intestine were absent in only two. In one case they were discrete, having only two ulcerations at the colonic angle and ascending colon; in four cases they were more extensive and important than in the small intestine; in two cases they were almost confluent and involved the entire length of the large intestine up to the rectal ampulla.

The lesions of the large intestine are met with in two types. The first is characterized by small prominences two to three millimetres high and eight to ten millimetres in diameter, perfectly circular with an occasionally depressed surface, but were commonly eroded with a ampuliform depression. The second type, which perhaps results from the first type, is characterized by large round or oval ulcerations one to five centimetres in diameter, deep and bordered by clean cut projecting edges. The bottom of the ulcer is either smooth or covered by a dirty slough, the deeper ones involving the muscular or even the serous layer.

The mesenteric, ileocecal and mesocolic lymph nodes are always involved. They are tumefied, much more so than in typhoid, red, and firm. On section hemorrhagic points are seen, while histologically there is an intense infiltration of lymphatic cells in both the cortical and medullary substances. The vessels are engorged with blood and in some areas of the medullary substance real patches of blood exist. Peritoneal lesions, with or without intestinal perforation, have been met with. In one case the starting point of a generalized peritonitis with cloudy exudate was the ulcerative lesions in the large intestine which extended down to, but without perforating the serosa.

The spleen was found hypertrophied in most autopsies. It may be slight, the organ weighing 230 to 300 grams; or it may be considerable, the soft and diffuent spleen, weighing 475 to 490 grams. Histologically, the Malpighian corpuscles are very numerous and are the seat of a distinct inflammatory infiltration. The splenic pulp is the seat of congestion. The red blood corpuscles are much more numerous than normally and in certain areas there exist real hemorrhagic foci.

The liver may not be much involved. Sometimes it is quite small, weighing less than 1,200 grams, but in most cases it assumes the aspect of an infectious liver, weighing 1,800 to 2,200 grams, friable, and mottled with areas of congestion alternating with foci of fatty degeneration. Microscopically, the blood chokes the hepatic trabeculae which have undergone degeneration in the neighbor-

hood of the suprahepatic veins. The gallbladder is usually not involved, at least apparently so, but Grattan and Wood found its walls inflamed and thickened. As to the bile, it almost always contains the paratyphoid A bacillus.

The kidneys are usually normal although several observers have met with the large white kidney or pale, mottled renal glands with scattered areas of congestion, microscopically presenting a certain degree of parenchymatous nephritis. The heart is almost always somewhat pale and flaccid. Twice lesions of acute endocarditis have been met with, one was a vegetating endocarditis of the aortic valves, the other a plastic endocarditis of the mitral and pulmonary orifices. Phlebitis and arthritis have been reported. The lungs almost always offer a congestion more marked at the base. The alveoli are filled with blood or the fluid of edema. Sometimes the lower lobe is splenified, the organ weighing 700 to 800 grams. In one case there was bronchopneumonia, while on the pleural surface were a dozen minute whitish yellow abscesses, a very thick yellow pus issued from the small bronchi. In other cases the bronchopneumonia was accompanied by an abundant purulent pleural collection. The rarer lesions are to be found in the central nervous system. Thus in one case the patient presented nervous accidents ending in coma and death. At autopsy there was an intense congestion of the pia mater in the frontoparietal region which did not extend, at least macroscopically, to the brain itself. Bacteriologically, the paratyphoid A bacillus has been obtained in a pure culture or in association with the ordinary bacteria of the intestine, from the spleen, liver, bile, kidneys, blood, and ileocecal and mesenteric lymph nodes.

To sum up the question, it would appear that the lesions produced by the paratyphoid A bacillus consist of an intense congestion as in the majority of septicemias. The intestinal lesions are variable, often less intense than in typhoid fever. It would likewise appear that the paratyphoid A bacillus possesses less necrosing properties than Eberth's organism; but this is merely a question of degree. Alone, the lesions of the large intestine on account of their frequency, seem to be characteristic of the paratyphoid A bacillus, but they are occasionally encountered in typhoid fever, when they are more important than the lesions of the small intestine. Therefore, there are no essential differences between the lesions produced by Eberth's bacillus and those resulting from the paratyphoid A bacillus.

MEDICAL NEWS FROM WASHINGTON.

Higher Rank for Medical Officers.—*Low Casualty List in the Navy.*—*Forthcoming Vacancies in the Naval Hospital Corps.*—*Control of Communicable Disease and Seams.*—*The Health Department and Merchant Seamen.*

There is active opposition on the part of the War Department, particularly in the general staff, to the bills pending in Congress proposing to fix the grades of the commissioned officers of the Medical Corps and of the Medical Reserve Corps of the Army on active duty.

The proposed legislation provides that one fourth

of one per cent. of the officers of the Medical Corps shall be major generals, a like proportion brigadier generals, four per cent. colonels, eight per cent. lieutenant colonels, 23½ per cent. majors, thirty-two per cent. captains, and the remainder first lieutenants.

The Surgeon General of the Army and prominent members of the medical profession connected with the reserve corps were before the Senate Military Committee recently and protested against the opposition within the War Department to the measure. General Gorgas charged that line officers had no hesitation in ignoring the sanitary recommendations of medical officers of lower rank, and he pleaded that medical members of the army should get rank commensurate with the importance of the positions they held. The medical officers insist that they should have increased rank and authority, together with absolute responsibility in matters pertaining to sanitation and preventable disease and the general health of the military forces. Complaint was made of the lack of centralization of power or authority, and it was insisted that to gain effectiveness it must be had.

Opposition to the legislation was expressed in a communication from the Acting Secretary of War, who was called upon by the Senate Military Committee for an expression of opinion. He stated, among other things, that, if the Medical Reserve Corps should obtain special recognition, other branches of the service will feel discriminated against.

Figures prepared in the Bureau of Medicine and Surgery, Navy Department, covering the period from the beginning of the war, April 6, 1917, to December 31, show a surprisingly low casualty list for war time. During that time, five officers were killed, and no officers wounded due to enemy action. During the same time, 130 enlisted men were killed and ten wounded while in contact with the enemy. The casualties in the Marine Corps during that period in the campaigns in Haiti and the Dominican Republic were four officers and five enlisted men killed, and five wounded. These figures do not include any casualties other than when occurring in action. Aviation accidents in this country, also do not appear in the list.

Gratifying reports are at hand concerning the health of the personnel of the Atlantic Fleet. Despite the large influx of recruits and newly appointed officers, the sick rate continues very low. Medical Inspector Frank E. McCullough, fleet surgeon, recently made some comparisons of sick figures in the fleet with the conditions of health prevailing in the Philippines during his cruise in those waters several years ago, and he found admissions to the sick list in the Atlantic Fleet in war were about one third lower than in peace time. The newcomers have readily acquired the habits of ship sanitation and cleanliness.

With the enlisted strength of the navy filled to its legal limits, the Naval Hospital Corps has practically no vacancies. With the large increase contemplated by pending legislation, a considerable number of additions to the Hospital Corps will be

required, and it is expected that active enlistments for this branch of the navy will be resumed as soon as the bill becomes law. It is intended to recruit from 2,000 to 3,000 men for the Hospital Corps immediately upon the passage of the bill, and it is hoped to obtain a large part of the additional force before the beginning of summer.

* * * * *

The Public Health Service has been directed by the Secretary of the Treasury to make an investigation for improved methods for the prevention and control of communicable diseases, especially near the army cantonments. The study, which will commence immediately, will involve both field and laboratory work, and the special facilities of the hygienic laboratory at Washington will be utilized. The work will relate largely to standardization and preparation of serums.

The first serum to be studied will be that used in cerebrospinal meningitis. The prevalence of the disease at this time, and the fact that serum has been found to be the most effective treatment, show the importance of such a study. Efforts will be made to develop methods of securing a more reliable serum, and then, with control over its sale in interstate traffic, to see that the methods are used. It is expected that some improvements will be made also in the case of serums used in the prevention and treatment of other communicable diseases.

In the present war, American soldiers have remained practically free from typhoid fever, because of the use of antityphoid vaccine. It has also been used with great success by the Public Health Service in sanitary areas adjoining military and naval reservations for the purpose of protecting the civil population and the troops.

Conditions must be relieved prior to June 1st, next; otherwise, little can be done to prevent widespread malarial infection, loss of efficiency, and increased claims for compensation. These twenty-two areas exist in the south, and much ditching, stream training, oiling, and similar malaria control measures must be taken into account, which is estimated to cost about \$381,000.

In the rural sanitation work now being conducted by the Public Health Service, it is necessary that the field workers travel daily through extensive territory where there is no regular means of transportation, and the use of motor vehicles, therefore, is indispensable; and, as the law does not permit purchase of such vehicles, they must be hired. Accordingly, it is urged, that authority be given the service for the purchase of such vehicles.

A Senate bill extending the benefits of care and treatment by the Public Health Service to seamen on vessels used in the service of the United States has passed the Senate. It provides that persons of this class, whose care and treatment are not otherwise provided for by the Government, shall be entitled to such privileges of care and treatment by the Public Health Service as now are accorded to seamen on documented vessels of the United States.

Representative McCormick has introduced a bill that proposes to transfer the Public Health Service from the Treasury Department to the Interior Department.

Editorial Notes and Comments

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HIGHER RANK FOR MEDICAL OFFICERS.

The appearance of General Gorgas, Major Charles H. Mayo, and Major Franklin H. Martin, before the Military Committee of the Senate on March 15th, has created a sensation in army circles. These officers appeared at a hearing on the Owen bill which would provide for seventy medical officers with the rank of either brigadier or major general. The sensational feature of the hearing was that a letter had been addressed to the committee by the Acting Secretary of War opposing the measure which was supported by the Medical Department. According to the newspapers, President Wilson is in sympathy with the Medical Department in requesting authority for the creation of officers of higher rank, while the Secretary of War and the general staff are opposed to the bill.

We have already before us an admirable precedent to follow in this matter. Some years ago, the navy sought and obtained higher rank for its superior officers on the ground that when in contact with naval officers abroad the lack of adequate rank on the part of our naval officers placed the United States Navy at a material disadvantage as

regards precedence. The same argument brought about the advancement of many of our foreign ministers to the rank of ambassador. In the same way, our medical officers abroad find themselves outranked by men who in civilian life do not enjoy anything like the reputation of the American surgeons. In our Medical Reserve Corps we have many brilliant surgeons, men with an international reputation, and with princely professional incomes who have abandoned these incomes for service as majors. When on active duty abroad these men find themselves outranked by French, Italian, and English surgeons. Since military rank is the only measure of authority in military service these brilliant surgeons are not in a position to exert their ability to the best advantage for the service. Moreover in their relations to the officers of the line their lack of adequate rank belittles their standing and detracts from the force of their recommendations. It is not expected or desired that the change will give the officers absolute military authority. But their value to the service will be much enhanced by being given rank commensurate with the authority which they should exercise. It is to be hoped that the Congress will enact the Owen bill, both as a matter of justice to a profession which has responded to the call of duty in a most unprecedented manner, and in order to give to the Medical Department of the Army the fullest measure of authority and of efficiency.

COMMERCIAL INFRINGEMENTS IN MEDICINE.

In these times when efficiency must prove itself against inefficiency each branch of medical practice is put to the test to meet the ideals of accurate scientific service to the public.

Medicine must ever be on the alert for opportunities for progress and public service, and yet restrain these within the limits of true scientific therapy. Otherwise a pseudotherapy which blindly creates new difficulties or caters ignorantly or deliberately to existing weaknesses will grow up outside the medical fields. It is to the public, however, that the physician has to make his appeal for regulation and restraint of such false therapies. The demand lies with them and fit legislation also. Yet they are all too readily led astray by specious attractions and misrepresentations of fee schedules, pseudo-scientific claims or what not.

Psychotherapy becomes, for example, a well sounding term to conceal many of the mysteries

which surround mental disease especially, and is offered and sought after by those who understand little or nothing of the actual meaning of mental symptoms or of the definite nervous mechanism through which these express themselves, and upon a knowledge of which psychic treatment must be thoroughly based. On the other hand, a variety of forms of physical manipulation are credited with wonder working power, and, here again, lack of knowledge fails to realize the intimate working of the bodily mechanism and the subtleties of mental or psychic effort or craving, so that certain pathological mental traits or tendencies are merely fed and strengthened and the body put still more at the mercy of the real causes of many ills, both physical and psychical, by the means used ostensibly to cure them. Here there is actual, ignorant tampering also with the physiology of the body and a curious disregard of the functional development of exactly this bodily mechanism, which can be better trusted to take care of itself in smoothly performing these established functions than if interfered with by those untrained in anatomy, physiology and ignorant of the fine, complex relationship of these to the biological, yes, and the psychical purpose behind them.

Muscular treatments of various kinds, intestinal interferences, lavage, these are but some of the practices ignorantly undertaken and carried out falsely in the name of science.

Roentgenology, in the flush of its growing success and extending value in diagnosis and treatment, is meeting with this same fate. Its practice is being commercialized and public interest in it and demand for it are utilized for private ends. There are x-ray technicians who have received a certain amount of technical training in the offices of physicians or in hospitals, who afterwards become ambitious to set up their own private offices or laboratories. While not claiming to practice medicine, they actually do so, because they give x-ray treatment and also use barium sulphate in stomach and intestinal work, which is a drug protected by the medical practice act, and, moreover, confoundable with the very poisonous barium sulphite. X-ray treatment should only be given with caution, careful records of dosage made, attention to length of exposure, and with provision for meeting serious accidents which only a physician can handle. Other medical factors enter into the determination of the advisability of employing the x-ray, and the extent to which it should be used. On the diagnostic side it is distinctly a physician's problem, diagnosis being practically and technically a part of the practice of medicine. Description of plates, with reference to pathological findings and expression of opinions and conclusions

drawn therefrom are distinctly in his province. The literature sent out from these commercial laboratories contains enticements through rebate, offering of view boxes and the like, and in a misleading fee schedule. The latter does not indicate that when there are added other fees necessary to a thorough examination, which should accompany x-ray work, the total fee would amount to more than that charged by a competent medical roentgenologist.

The last word has not been said in regard to this form of supply for public demand. It is necessary that the public shall know more clearly what it is they are really getting through the specious enticing offers. This must be accomplished by a surer basis of scientific endeavor on the part of the physician: a clearness and directness both in his own knowledge and practice, and also knowledge on the part of the public as to what they are seeking and what they are getting in the stones offered them instead of bread. Only then the medical profession may claim and obtain through the public the safeguarding and the opportunity which will ensure progressive efficiency.

THE CARREL-DAKIN METHOD.

Probably the most important single contribution made to the treatment of gunshot wounds in the present war is that by two Americans, Dr. Alexis Carrel and Dr. H. D. Dakin, and the work done in the hospital at Compiègne proves the immense value of this method in the treatment of infected wounds. The method was received with such a uniform chorus of approval, that it was but natural there should be some reaction, this all the more to be expected in view of the fact that the greatest success in the application of the Carrel-Dakin fluid can only be achieved by keeping the fluid within narrow limits of acidity or alkalinity. The rough and ready methods necessarily pursued in a war hospital cannot be applied successfully to this particular treatment. The solution must be freshly made, must be accurately titrated, and the technic of its application as laid down by Carrel closely followed.

Under the conditions ordinarily existing in war hospitals, it is difficult to carry out these instructions, and we therefore hear notes of disapproval from time to time which, as Carrel says, are very apt to be based upon faulty technic. It is for this reason that the Rockefeller War Demonstration Hospital has been erected in New York, where surgeons may receive instruction under Carrel himself.

Some time ago, we published an article by Carrel's assistant, Loewy, in which the remarkable re-

sults achieved by the proper application of this method were shown by illustrations. Another contribution on the subject by Doctor Hupp, in the *NEW YORK MEDICAL JOURNAL* for February 2nd, testifies to the excellent results achieved by the method. In commenting on this method editorially some weeks later, we called attention to various criticisms of the method which had appeared. This for the information of our readers rather than with any view of endorsing such criticisms. The history of the cases which have been treated under Carrel's own supervision both abroad and in the United States, amply demonstrates the value of the method. The mere fact that it has not been adopted universally does not necessarily involve a denial of its value.

In medicine, idiosyncrasies of patient and practitioner must be considered in the selection of any method of treatment. We therefore have had a succession of suggestions for the treatment of infected wounds, but many of these have, after brilliant promise, been discarded even by their proponents. The Carrel-Dakin method and dichloramine-T, while not yet universally accepted as undeniably the best for treating infected wounds, continue to grow in popularity wherever the circumstances are such that they can be applied in accordance with the instructions of their inventor.

THE DIAGNOSIS AND TREATMENT OF GALACTOCELE.

Galactocoele has characteristic symptoms which properly belong to it and is a well defined clinical affection, but from the viewpoint of pathology this morbid unity disappears and becomes confounded in the large family of adenofibromata and sclerocystic mastitis. The accumulation of milk in a pocket is undoubtedly due to excessive secretion of irritated epithelial cells with, at the same time, an occlusion of the lumen of the excretory ducts from epithelial desquamation.

A galactocoele undergoes a very slow evolution and grows by fits and starts with each pregnancy. The process rarely regresses, but Siebold and Moore have mentioned instances of temporary lacteal cysts which disappeared spontaneously. This is exceptional, and usually the growth persists, but it is not uncommon to observe alternatives of increase and diminution in the size of the tumor during its evolution.

Inflammation and suppuration are final outcomes of the morbid process much more frequently than is generally supposed, and Reclus

was of the opinion that chronic abscess of the breast is merely an inflamed galactocoele. The axillary lymph nodes become enlarged and suppuration occurs. A malignant transformation arising in a galactocoele has not as yet been observed, and, all things considered, the prognosis is benign.

The diagnosis of galactocoele is not always an easy matter and errors are readily committed on account of the consistency of the contents, which gives the impression of a solid neoplasm. Even if fluctuation is detected the real nature of the contents is not suspected, probably on account of the infrequency of the affection.

A recently developed galactocoele might be mistaken for an abscess, but there is total absence of inflammatory symptoms. When it is of long standing it may be considered a cold abscess, and in reality a galactocoele has been known to transform one into the other process.

The clinical diagnosis is to be made with that of adenofibroma and with cystic disease of the breast. In the latter process the pain is much more marked than in galactocoele, extending to the shoulder and arm and exasperated at the time of the menses. Superficial palpation reveals a tumor which may be taken for a fibroma or a cancer, but if attentively done, multiple, hard, and elastic nodules will be found scattered throughout the gland. These vary in size from shot to a pea. The lesion is most frequently bilateral.

Lipomata do not often develop in the breast and an acute cancer is extremely rare, but there are genuine cases of diffuse cancerous mastitis on record with very rapid evolution, early cachexia, and death within a short time. No such clinical picture is offered by galactocoele.

To diagnose a galactocoele the coincidence of the growth with pregnancy and lactation must not be lost sight of. The exit of milk from the nipple when the gland is massaged has been given as a pathognomonic sign, but it loses much of its value if the patient is nursing at the time.

Puncture and an analysis of the liquid withdrawn will remove all doubt as to the real nature of the morbid process.

In the treatment of galactocoele the first thing to do is to wean the baby, if nursing is near its end, or as soon as possible, because lactation unquestionably causes a rapid increase in the size of the tumor. If, however, it is thought better to continue nursing, this may be done if the galactocoele is small and painless and empties itself partially by the nipple.

The radical treatment is simple, the best being

a free incision of the cyst followed by drainage and removal of the nodules of adenoma, but when the morbid process is small and limited in extent enucleation of the cyst is proper or extirpation *en masse* may be resorted to.

Injections of iodin or other irritating liquids into the cyst cavity are to be condemned, particularly because the liquid injected may reach the healthy glandular structures, as there are many ways of communication between them and the cystic cavity.

A NEW MEDICAL SERVICE.

There is no time for lengthy debates in the British House of Commons at present, though ghostly Parliamentarians haunting old scenes, might be considerably puzzled to define an Air Board, or an Air Ministry, or what these wanted with a Medical Air Service, and why the ordinary doctor would not do, and if, as Sir Watson Cheyne remarked in the *Lancet* of February 8th, the army and navy had taken all the doctors available, how they were to get special ones, or, indeed, any at all.

Though the question of supply is very much "up in the air," the "Medical Service of the Air Force" has been nominated by Parliament, Sir Watson Cheyne's plea there for a combination of research physiologist and doctor who could give his whole time to the aviators and act in pretty much the same way as a trainer of athletes, being irrefutable. To pass a man on entry or to assist at his post-mortem is not enough. He must be an expert in the particular forms of disease incidental to aviation; be able to decide each day which men are fit to fly, and how the atmospheric conditions they will meet may affect their individual nervous system. In the beginning accidents were attributed to faulty machines; now it is realized that ninety per cent. arise from faulty human machines.

One wise decision is that the doctors are not to be shifted from one service to another, and, although both army and navy are on the committee, these services are to give more than usual audience and acquiescence to demands from the airmen, as coming under a subject of which they themselves are considerably ignorant. The arrangement of the committee is as follows, and may perhaps be useful as a guide when we have also to create a new service.

The medical affairs of the air force are to be controlled by a committee responsible to the Air Council. On the committee is the director general of the Naval Medical Service; the director general of the Army Medical Service; the vice-president of the Air Council; a medical administrator of the Air Force; an assistant medical administrator; one

neurologist, one physician, one surgeon, one physiologist, and the secretary of the Medical Research Committee. The administrator of the Medical Air Service will have *direct access to the Secretary of State*.

Those who are somewhat sceptical as to all this specialization in doctors and men would do well to talk with any expert airmen they come across and to study the some seventy atmospheric conditions which may spell success or failure, life or death, as given in *Meteorology and Aeronautics*, Report No. 13, issued by the National Advisory Committee for Aeronautics, from Washington, D. C.

THE OVER ZEALOUS LADY COLLECTOR.

Many energetic ladies collecting for war needs, often leave the "working classes" alone, because they are popularly supposed to be poor, yet worry the class above who have to contend with the falling off of employment or clients; the having to "keep up appearances" and the increased prices for food. Personal communications from England and trade reports say that never before was there such a demand for smart clothes and house adornments as at present, because the hitherto illpaid factory workers are now getting such high wages in Government employ, whereas the small clerks, the teachers and the shabby genteel who do professional work for small pay are in a bad way, and, having empty pockets and full hearts, suffer acutely when the prosperous lady collector sternly tells them it is their duty to help. To this class "going without" in order to give means stern self-denial, and the effects of the denial are seen in the added number of "run down" patients who come to the doctor. As they formerly ate only what they needed, they are now not getting enough to eat, nor enough of anything. School teachers suffer most, as the demands are incessant, and, indirectly, the pupils suffer also from the shortened diet now taken by their teachers. Even the struggling doctor's wife is rather badly hit, for those who pay more at the restaurant would open wide eyes of enquiry if the doctor asked an extra dollar because of the advanced prices in drugs. The unionist workman is now making twice as much as the small professional, and it is to these the lady collector should direct the outflow of her polite nagging.

LITERARY WAR BABIES.

Although the war has caused many medical journals to grow thinner and thinner, with apologies weekly for their altered appearance, and some have even died, there comes to us occasionally a very small "No. 1" easy of circulation among the special body for whom it is designed. The latest is the *Bulletin of the Canadian Army Medical Corps*, to be supplied to every unit of the Canadian Army Medical Corps. Besides excellent articles of general interest, it has news of the corps, administrative notes, and the latest list of war literature. It seems a healthy infant and should have a long life.

News Items.

Promotions in the Medical Reserve Corps.—The following promotions have been announced in the Medical Reserve Corps of the National Army: To be lieutenant colonels: Major Elliott B. Edie, Major Lewis Wine Bremerman, Major William Henry Haskin, Major Harry B. Reynolds, Major William H. G. Logan, Major Bruce Foulkes.

Neuropsychiatry and Mobilization.—An address on this subject will be delivered by Lieutenant Colonel Pearce Bailey, Medical Reserve Corps, U. S. Army, Thursday evening, April 4th, at the New York Academy of Medicine. Dr. Charles L. Dana will open the discussion and will be followed by Dr. L. Pierce Clark and Dr. C. W. Pilgrim.

American Surgeon Decorated.—Lieutenant H. H. Davies, M. R. C., U. S. Army, attached to the British Army Medical Service in France, has been awarded the American Distinguished Service Cross for valor in remaining in a destroyed dugout under shell fire in order to complete an operation which saved the life of a British soldier. Lieutenant Davies is the first, or at least among the first, to receive this newly instituted decoration.

To Increase Hospital Facilities.—Bills have been introduced into the New York State Legislature providing for the expenditure of \$2,500,000 for the construction of buildings to accommodate the insane and feeble-minded. Bills have also been introduced providing for the enlargement of State hospitals in or near New York city, the completion of the State Hospital at Marcy, near Utica, and the establishment of a psychopathic hospital in New York city.

Meetings of Medical Societies to Be Held in Philadelphia during the Coming Week.—Monday, April 1st, Blockley Medical Society, Clinical Association; Tuesday, April 2d, Aid Association, County Medical Society, Medical Examiners' Association, Wills Hospital Ophthalmic Society; Wednesday, April 3d, College of Physicians, Laryngological Society; Thursday, April 4th, Academy of Surgery, Obstetrical Society; Friday, April 5th, Kensington Branch, County Medical Society, Physicians' Motor Club (directors).

Meetings of Medical Societies to Be Held in April.—Alabama State Medical Association, Birmingham, April 10th; American Orthopedic Association, Washington, D. C., April 22d-23d; California State Medical Society, Del Monte, April 16th-18th; Georgia State Medical Association, Savannah, April 17th-19th; Louisiana State Medical Society, New Orleans, April 16th-18th; Maryland Medical and Chirurgical Faculty of Baltimore, April 23d-25th; North Carolina State Medical Society, Pinehurst, April 16th-18th; South Carolina Medical Association, Aiken, April 16th-17th; Tennessee State Medical Association, Memphis, April 9th-11th.

War Time Savings.—A meeting, under the auspices of the Health and Hospital Committee of the National War Savings Committee will be held in Hosack Hall, New York Academy of Medicine, Wednesday evening, April 3d, at 8 o'clock. The program includes the following papers: Common Economic Fallacies of the Average Man, by Professor Edwin R. A. Seligman, Department of Economics, Columbia University; Economy from the Hospital Standpoint, Dr. S. S. Goldwater, director of Mount Sinai Hospital, New York; Financing of the War and War Savings Societies, by Mr. George W. Wickersham, former Attorney General of the United States.

Reeducation of Blinded Soldiers.—Mrs. T. Harrison Garret has offered the Surgeon General of the United States Army her Baltimore estate of ninety-nine acres as a hospital school for blinded officers and men. The estate now has on it a building which will accommodate 150 men and another which will accommodate twenty-five officers. Mrs. Garret will also provide a home in Baltimore where some woman member of the patient's family can live while he is receiving instruction. The Surgeon General's Office has been studying the methods used by the French and British governments and has organized a survey for the purpose of finding situations for the men when their reeducation has been finished.

A Memorial to Doctor Cheever.—A large bronze memorial bas relief of Dr. David W. Cheever was unveiled in the amphitheatre of the Boston City Hospital on Thursday, March 21st, with appropriate ceremonies. Dr. Cheever became surgeon to the hospital at the age of thirty-three years and was associated with the institution from its foundation in 1864 until his death in 1915. The tablet was presented by Dr. David Cheever, son of the physician in whose memory it was dedicated. Dr. George W. Gay presided, and among the physicians present, most of them contemporaneous with Doctor Cheever, were: Dr. George B. Shattuck, Dr. J. Collins Warren, Dr. George H. Monks, Dr. Thomas A. De Blois, Dr. John Babst Blake, Dr. Edward H. Nichols; Dr. Paul Thorndike, Dr. Charles Allen Poeter, Dr. Charles M. Green, Dr. George L. Tuttle, Dr. J. L. Hildreth, Dr. Samuel G. Webber, Dr. James J. Putnam, Dr. Edward Cowles, Dr. Fred C. Shattuck, Dr. William C. Boardman, and Dr. Edmund W. Wilson.

Meetings of Medical Societies to Be Held in New York during the Coming Week.—Monday, April 1st, Clinical Society of New York Throat, Nose, and Lung Hospital, German Medical Society of the City of New York, Brooklyn Hospital Club, Clinical Society of the New York Polyclinic Medical School and Hospital, West Side Physicians' Economic League; Tuesday, April 2d, New York Academy of Medicine (Section in Dermatology), New York Neurological Society, Amsterdam City Medical Society, Society of Alumni of Lebanon Hospital, New York, The Medical Society of Bay Ridge; Wednesday, April 3d, New York Urological Society (annual), Brooklyn Society for Neurology, Society of Alumni of Bellevue Hospital, Harlem Medical Association, Bronx Medical Association, Long Island Society of Anesthetists; Thursday, April 4th, New York Academy of Medicine (stated meeting), Brooklyn Surgical Society, Physicians' Economic Society of New York; Friday, April 5th, New York Academy of Medicine (Section in Surgery), New Utrecht Medical Society, New York Microscopical Society, Gynecological Society, Brooklyn Practitioners' Society of New York, Society for Serology and Hematology, New York, Alumni Association of Roosevelt Hospital; Saturday, April 6th, Benjamin Rush Medical Society, New York.

Occupational Diseases.—The following resolutions were offered by the Public Health Committee of the New York Academy of Medicine at a meeting held on March 7th:

That the matter of the need of instruction in the recognition, treatment, and prevention of occupational diseases should be brought to the attention of the authorities of the medical schools of New York City, with a request that a special course be given through at least one term, with particular reference to the numerous poisonous substances used in industry and their deleterious effects.

That special clinics be organized under the auspices of the medical schools in order that occupational diseases may be studied and treated under competent guidance and supervision.

That consideration be given to the desirability of the establishment of special clinics, under the auspices of teaching institutions and health agencies, in the neighboring towns of New York City, where large manufacturing and munition plants are located, with a view of facilitating the utilization by the men and women employed in these factories, of the thus established medical opportunities.

That the representatives of the large hospitals and dispensaries be impressed with the importance of accurately recording the details of occupation of all patients entering the institutions, and collecting data regarding them, and the need of providing adequate facilities for their treatment.

That the importance of early recognition of occupational poisons be brought to the attention of medical practitioners of this city, and that they be urged to report such cases promptly to the city Department of Health in order that better follow-up supervision may be provided.

That the medical press be requested to give more space to the discussion of occupational diseases than they have hitherto done.

That proper educational facilities be established by the State Industrial Commission and the New York City Department of Health in order that the large number of men and women working in hazardous trades should understand the nature of the hazards and know how to avoid them and to seek early medical advice when the first symptoms of poisoning appear.

That the excellent work done by the Bureau of Occupational Diseases of the New York City Department of Health be encouraged and means provided for its extension.

That the manufacturers be impressed with the importance of safeguarding the health of employees through adequate medical supervision, efficient factory sanitation, and the prevention of occupational diseases.

That the Federal Government, in the interest of the conservation of the health and efficiency of the workers, be requested to co-operate in the effective supervision over the conditions prevailing in factories producing munitions of war and other allied products, through the corps of experts associated with the United States Public Health Service.

Modern Treatment and Preventive Medicine

A Compendium of Therapeutics and Prophylaxis, Original and Adapted

THE TREATMENT OF HEMOPHILIA.

By LOUIS T. DE M. SAJOUS, B. S., M. D.,
Philadelphia.

The degree of tissue injury required to induce bleeding in hemophilia appears to be, as a rule, less than that necessary in normal subjects. The abnormality lies rather in the amount of bleeding which follows when once the flow of blood has been started. Spontaneous bleeding can also occur. Again, the condition is not of an evanescent nature, but appears as a constitutional hereditary defect peculiar in being transmitted typically by females, though clinically manifest chiefly in males. This rule as to sex incidence and transmission, while considered well established since the extensive study of Bulloch and Fildes, seems to have many exceptions. Grandrider's early observations, 1871, led him to conclude that one actual bleeder in thirteen is a female, but several more recent writers hold the sex ratio to be much larger, and, according to Taludi, 1904, nearly one third are female. Some families seem to follow accurately the rule as to sex and transmission, while in others the incidence as to sex is irregular throughout. Steiner, 1900, has even reported a family in which only females were affected and the condition was transmitted directly from mother to daughter. On the other hand, in a family given by Litten, 1903, the disease was transmitted from father to son for three generations.

It is now recognized that uncontrollable bleeding in infants is occasionally due to an actual hemophilia. Larrabee, 1906, credits to this source any case in which there is a distinct history of the disease in the family, and in which, though recovering from the initial hemorrhage, the subject is found to remain a bleeder in after life. The vast majority of cases of melena in infants, however, are non-hemophilic, bacterial infection probably being the cause. Larrabee was able to collect thirty-seven instances of true hemophilia of the newborn, and found that among these the umbilicus or cord was affected in twenty-three, the skin in seven, the nose in six, the bowel in four, the joints and genitourinary tract, each in two cases, and the gums, stomach, and an operative wound, each in one case. The mortality was sixty per cent.—a percentage, curiously enough, almost precisely that noted by Townsend, in a series of hemorrhagic cases of infectious origin.

All workers agree that the immediate or proximate cause of the persistent bleeding in hemophilia is impaired coagulability of the blood, manifest in a greatly prolonged coagulation time. Addis, 1910, observed that under conditions which led to coagulation of normal blood in ten minutes, clotting sometimes took over eighty minutes in hemophiles. The factors involved in coagulation being several, delayed coagulation may arise from a variety of abnormal conditions. Whipple, 1912, described a special form of abnormal bleeding which occurs in hepatic cirrhosis and is due to a deficiency of

fibrinogen. As for hemophilia, the explanations advanced for the coagulation defect vary according to the opposing theories of normal blood coagulation adopted. In Morawitz's theory, the thrombin which leads to solidification of the soluble fibrinogen to form fibrin results from the activation of prothrombin by the combined action of calcium and a ferment termed thrombokinase, the latter derived from any and all tissue cells of the body. According to Howell's theory, on the other hand, clotting is initiated by neutralization of an "antithrombin" by the thromboplastin of the tissues over which blood is shed. The natural combination of antithrombin with prothrombin in the blood stream is thus broken up, and the free prothrombin, activated by calcium to form thrombin, acts on the fibrinogen to form fibrin. According to Sahli, 1905, and others who adopt Morawitz's views of normal coagulation, the essential cause is an insufficient or defective formation of thrombokinase. On the other hand, according to Addis, 1911, and Howell, 1914, the difficulty is an impairment in the circulating prothrombin. Again, Sir A. E. Wright, in 1894, asserted that the hemophilic state was due to a deficiency of calcium.

The more recent work in this country seems to afford rather firm support to Howell's view of prothrombin deficiency. Hess, 1916, and Horwitz and Lucas, in 1916, adduce evidence which favors it. As Lucas stated in 1909, it has been proved both experimentally and clinically that prothrombin is derived from the blood platelets. Parenthetically it is of interest to note that thrombokinase, the substance deemed deficient in hemophilia by Sahli, is likewise derived, to an important extent, from the platelets. Attention having been thus strongly directed to the condition of the platelets, Minot and Lee, 1916, made a careful study of these bodies and found that in hemophilia they failed to behave like normal platelets, though in number they were essentially normal. When normal platelets in about normal amounts were added to hemophilic blood plasma they caused coagulation in an approximately normal time, yet, when hemophilic platelets were added, even in seventy-five times as great a concentration as in normal blood, coagulation was never reduced to anywhere near normal. The conclusion was reached that the delay in hemophilia occurs in the initial step in coagulation, which seems to be "a rendering of the platelets available by some process like solution." The platelets, while normal in number, seem abnormally resistant and do not give up their prothrombin readily enough. Hemophilic blood plasma is thus likely to contain only minimal amounts of dissolved prothrombin. From this viewpoint, the rational treatment of hemophilia would consist, under emergency conditions, in supplying at once, artificially the lack of prothrombin, and during the intervals between hemorrhages, either in promoting the formation of less resistant platelets, or, possibly, in supplying some agent which would hasten their dissolution.

Beginning, now, with one of the simpler measures that have been recommended in the treatment of hemophilia, one may ask, what is the actual value of the soluble calcium salts? Although excellent results were at first claimed by Wright from the administration of calcium chloride or lactate, more recent observers have concluded that these salts do not definitely lessen the tendency to hemorrhage. This is accounted for by the now well known fact that in these cases calcium is nearly always present in normal amount in the blood. Yet, according to Kahn, 1916, there are certain bleeders in whom the disturbing factor is a lack of calcium, due to inability to properly assimilate lime from the food. The remedy directly indicated in such cases, it would seem, is calcium in the form of one of its soluble salts. Hess, 1916, and Cowie and Laws, 1916, also recognize that the calcium content of the blood may be low in occasional cases. To those in whom the tendency to bleed seems actually due to lack of calcium, the term "hemophilia calcipriva" has been applied. These instances, however, manifestly constitute only a small minority of the hemophiliacs.

(To be continued.)

Dietetic Treatment of Diabetes Mellitus.—

R. T. Williamson (*Practitioner*, January, 1918) presents three special forms of dietetic treatment which he has found useful. They are unsuitable for cases of persistent acidosis, and for those in which certain severe complications have occurred. If glycosuria continues after the patient has been on a rigid diabetic diet for a few days, these diets may be tried in any order, and in succession if necessary.

Diet A. Vegetables and jelly: Breakfast, 8 a. m. Coffee or tea with cream or milk; tomatoes, mushrooms, or onions; lettuce; jelly. 11 a. m. Jelly. Dinner, 1 p. m. Tomato soup; one or two of the following: vegetable marrow, onions, cabbage, cauliflower, curly green, asparagus, French beans, boiled lettuce, spinach, Brussels sprouts, cucumber, mushrooms; jelly. 3.30 p. m. Jelly. Tea, 5 p. m. Tea with cream or milk; one or two of the following: tomatoes, onions, lettuce, cucumber, salad, mushrooms; jelly. Supper. Jelly. The jellies suitable are: veal, beef tea, calf's foot, and lemon. This is the sole food for one week, the patient resting on the sofa all day. If the glycosuria persists at the end of seven days, an ordinary diabetic diet is given for a few days or a week, and then diet B is tried for seven days, the patient resting on the sofa all day.

Diet B. Eggs, milk, cream, etc. 8 a. m. Coffee or tea with one tablespoonful of cream; one egg, poached, boiled, or buttered. 10 a. m. Half a pint of warm milk. 12 noon. Custard prepared from one egg and half a pint of milk. 2 p. m. Half a pint of warm milk. 4 p. m. Tea with one tablespoonful of cream; one egg, poached, boiled, or buttered. 6 p. m. Two tablespoonfuls of cream in half a pint of warm beef tea. 8 p. m. A glass of warm milk, or one egg beaten up and added to half a pint of warm beef tea. 10 p. m. Two tablespoonfuls of cream in half a pint of warm beef tea. If this fails the patient is placed on the ordinary

diabetic diet for a few days and then the following is tried for seven days, the patient resting on the sofa. **Diet C. Casein and cream.** The patient is given, for seven or ten days only, a glass of casein, or biogene, and cream with water every two hours from 8 a. m. to 10 p. m. The casein preparation will probably be the most satisfactory for the majority of the patients. A cup of tea or beef tea, or both, may also be taken, if the patient desires, twice a day. The mixture of casein and cream is thus prepared: One tablespoonful of casein, or lait proto No. 6, one tablespoonful of cream; mix well in a tumbler with a fork or spoon, then add hot water, or cold if preferred, very gradually, mixing well until the tumbler is full. It may be sweetened with saccharin, and flavored with nutmeg, or by the addition of a tablespoonful of whiskey or sherry.

If this fails to check the glycosuria by the fifth or sixth day it is well to reduce the amount of casein to half the quantity. Sometimes one, sometimes another of these diets proves successful. When all have failed the author recommends the adoption of complete fasting for a period of one, two, three, or four days, during which the patient is allowed to take only coffee with cream three times a day, tea with cream three times a day, beef tea three times a day, whiskey and soda twice a day, and water as desired. After the glycosuria has been checked the diet is changed very gradually. Finally the author admits that all of these diets often fail in very severe cases, and sometimes fail to remove the glycosuria even in cases which at first appear to be of only medium severity.

Creosote Oil Injections in Keloids.—M. Lesieur (*Bulletin de l'Académie de médecine*, January 8, 1918), in view of Burlureaux's advocacy of creosote oil injections in pulmonary tuberculosis, was led to employ this agent in keloids, experimental work in the last fifteen years having tended to show a relationship between keloid and some infection—probably tuberculosis. A solution of ten grams of creosote in 150 grams of pure sterile olive oil is used. The oil should be washed with alkali in the presence of alcohol, the latter being later driven off by heat. The creosote should be freed of all traces of orthocresylol and phenol by distillation between 200 and 210° C. A metallic syringe similar to that in dental anesthesia is used, with a very sharp and fine needle. The needle is inserted in healthy tissue, above the keloid, and is pushed through the dermis till beneath the keloid—never through the keloid itself. The amount of the injection is from two drops to five mils. As much is introduced as the region in question, the extensibility of the cellular tissues, and local sensitiveness will permit. Ischemia, shown by loss of tissue coloration, is, however, a signal to stop the injection; sloughing is thus always avoided. The injections may be repeated on alternate days or even daily, care being taken to await complete absorption before a fresh injection at a given point. The injection treatment was well borne in 100 cases including several with very extensive keloids. The measure first causes disappearance of the violet or rose tint of the keloid. Dilated capillaries promptly disappear. The sycosis frequently present in facial

keloids is rapidly disinfected. The itching and pain which accompany some keloids is relieved by the first few injections. The tissue then softens and the tumor flattens down. This result is often obtained suddenly, after a considerable latent period of merely symptomatic relief. Applied in rapidly progressive keloids, however, enlargement may be checked by injections at the periphery of the tumors. Possibly the general effect of the creosote is a factor, improved appetite and body weight always following its use. Distinct amelioration of simple, nonkeloid, hypertrophic scars, including one case of Dupuytren's contracture, was also noted, and in two cases scars adherent to periosteum were loosened by the procedure. Persistent treatment is required, the time necessary for complete resolution ranging from two weeks to two, and even six, months.

The Factors Concerned in the Appearance of Nucleated Red Blood Corpuscles in the Peripheral Blood.—Cecil K. Drinker, Katherine R. Drinker, and Henry A. Kreuzmann (*Journal of Experimental Medicine*, February, 1918) studied the effect of circulatory changes in the bone marrow upon the peripheral blood, using exercise and nerve section to increase the blood flow. The effect of exercise was studied on normal animals, on hyperplastic animals with large numbers of normoblasts in the peripheral blood, and upon hyperplastic animals showing few or no normoblasts in the peripheral blood stream. Increase in the circulatory rate caused by exercise did not dislodge any multinucleated red cells from the bone marrow. In anemic and hyperplastic animals it was possible to produce pseudocrisis of nucleated red cells at certain periods by hard exercise, but the authors believe that this increase is merely a more accurate expression of circulatory content at the time of the procedure. The second method, section of the vasomotor nerves to the four limbs with consequent dilatation of the marrow vessels, gave negative results.

A Consideration of the Present Outlook on Tuberculin Therapy.—Paul H. Ringer (*Southern Medical Journal*, February, 1918) sets forth the following as fundamental facts in connection with the administration of tuberculin: 1. Tuberculin must never be looked upon as other than an aid in the treatment of tuberculosis; must never be accorded first place, and must never be allowed to supplant, but only to supplement a strict dietetic-hygienic regime. 2. Tuberculin must not be used by the inexperienced, as in their hands much harm will result. 3. Tuberculin must be used in a restricted number of cases, and a good reason for using it must be present, a reason other and better than the mere fact that the patient has tuberculosis. 4. The dose of tuberculin must not be regulated by rule of thumb, but must be highly individualized. 5. While opinions differ on this point, the writer believes that in the long run the optimum and not the maximum dose should be sought, as it is a well known fact that a large amount of tuberculin tolerance is not synonymous with the establishment of a high grade of immunity to tuberculosis. 6. Users of tuberculin must be on terms of intimacy with

the physical signs presented by their tuberculin patients, and they must be familiar with the early signs of activity in the lung, whether of recent or recurrent origin. 7. Users of tuberculin must auscultate their tuberculin patients before, practically, every dose, as only by so doing will mild focal reactions be recognized and dose governed accordingly. 8. Users of tuberculin must have before them a definite conception of what tuberculin can do, of its mode of operation, and of what is desired in each particular case. 9. The question of reactions must unfortunately vary with the viewpoint of the administrator of tuberculin. Opinions on this important point will continue to differ. No one will willingly produce violent systemic reactions, but the milder reactionary phenomena are desired by some and tabooed by others. Tuberculin is not a product to be used therapeutically by the general practitioner who has but two or three cases at a time to whom to administer it.

Utilizing the Rectum.—Douglas H. Stewart (*Western Medical Times*, February, 1918) in speaking of nutrient enemata says that if the rectum is to be employed for any medical or surgical purpose, a first and almost indispensable step is to soothe and to cleanse with a gentle, blood-warm saline injection that will remove mucus, mucopus, and feces. If a patient requires a hypodermic of morphine for the relief of pain, the analgesic effect may be almost doubled by slowly injecting an absorption enema of twenty grains of salicylate of soda dissolved in four ounces of water. Should the Murphy drip be urgently needed but unobtainable, or no one present knows how to run it properly: introduce a well lubricated catheter beyond the sphincters, leave it in position, and attach to it a fountain syringe containing four ounces of the solution, and add four ounces more every thirty minutes. If the fall be two feet or less, the effect seems to be about the same as that obtained by a Murphy drip set at one drop per second. The bag should be wrapped with a towel to conserve heat at a temperature nearly 120°.

Acidosis causes many surgeons to add an equal quantity of sodium bicarbonate to the table salt, from which the decinormal solution is made. Milk may be used as a solvent instead of water. Adrenalin or ergotole may be added. The milk saline alone may serve to check a hemorrhage.

Long continued enteroclysis is a simple and good expedient when used in connection with a Kemp double way irrigator employing five or six gallons of solution. A stronger solution than one heaping teaspoonful of salt to the quart of water is apt to make the rectum tender; a weaker solution has less efficiency. Should such a solution be used for a purgative, a heaping tablespoonful of epsom salts, or the same quantity of sugar, or both, will prove good additions. The correct temperature is about 100°.

The surgeon's cool enema is from 80° to 90°, his warm enema is from 100° to 110°, and his hot or kidney enema is from 115° to 120°; between 90° and 100° mixed effects are found, so it is worth while to attend to the detail of prescribing an exact temperature. Never use an ice cold enema upon an inflamed prostate; everything breaks down and goes to the bed with such a one.

ness. Both cool and warm enemata wash out intestinal bacteria, dilute the toxins in the blood, relieve toxemia, and must be employed in large quantities. If the blood is thirsty it drinks from the enema in the colon. No antipyretic has been more extolled. Improvement in bodily nutrition seems to be due to improved absorption that waits on improved elimination. Warm irrigation is a capital means of treating pelvic troubles, cystitis and prostatitis in the male, tubal and uterine congestions in the female. In both sexes it does well in sciatica and shock. The hot irrigation is called the twenty minute initiator of kidney action. Pressure enemata are damaging if not dangerous; a skilful hand may utilize them in intussusception, but no one can use them safely in ulcer. The mode of practical value is a sort of prolonged seepage. In preparing a patient for operation all cathartics should be omitted, but the bowel should be well washed out.

Distribution of Spirochaeta Icterohæmorrhagiae in the Organs after Intravenous Serum Treatment.—Renjiro Kaneko and Kikuzo Okudo (*Journal of Experimental Medicine*, February, 1918) base their report on autopsy material, obtained from eight cases of Weil's disease, in all of which the patients had received intravenous serum treatment before the eighth day of illness. The distribution of spirochetes in the organs is somewhat different in patients receiving serum treatment and in those not receiving it. A study of the tables would indicate that the immune serum of Weil's disease has the power to destroy the spirochetes in the organs of man, except in the kidneys, as here alone the scattered spirochetes seem to be resistant to the action of the serum. During the convalescent stage the spirochetes disappear almost entirely from all the organs, with the single exception of the kidneys, both in the serum-treated and untreated cases. The disappearance of the spirochetes from the organs and tissues is more marked when the intravenous method is used than when the subcutaneous serum treatment is employed.

VasoePIDIDYSTOMY in Obstructive Sterility.—V. D. Lespinnasse (*Journal A. M. A.*, February 16, 1918) incises the scrotum down to and into the tunica vaginalis testis. The epididymis is next exposed and the location of obstruction noted. A short longitudinal incision opens the lumen of the vas and colored fluid is injected into the central end. If this appears in the urethra the channel is known to be unobstructed. The capsule of the epididymis above the obstruction is incised carefully down to the tubules, removing all the layers and being most particular not to cut the epididymis tubule. This tubule will then protrude and a coil is selected having a long axis the same as that of the body of the epididymis. A suture of 00000 silk on a No. 19 bayonet needle is passed through the wall of the tubule, down two to four millimetres, and out again. The ends of this crown stitch are then passed in either direction through the incision in the vas; then a suture of extraordinarily fine catgut is passed through the entire thickness of the wall of the vas on either side of the incision to hold the incision open. Two more fine sutures are passed through the outer part of the wall of the vas near the two

ends of the incision and used to fix the vas to the epididymis and carry the weight of the testicle. The upper end of the crown stitch is threaded on a long Hagedorn needle, the testicle replaced in the scrotum, and the end of the stitch brought out through its wall. Necrosis of the wall of the epididymis tubule occurs in one or two weeks and the crown suture is slowly withdrawn. This leaves a patent opening directly from the epididymis tubule into the vas. This operation has proved successful in ten of eleven dogs and in the one human case on which it has been performed.

Antiscorbutic Value of Milk in Infant Feeding.—Harrlette Chick, E. Margaret Hume, and Ruth F. Skelton (*Lancet*, January 5, 1918) show by careful animal experiments that even whole, unheated milk has a very low antiscorbutic value and that this is further reduced to a marked degree when the milk is boiled or pasteurized. In confirmation of this fact they cite the observations of others to the effect that a diet of pasteurized milk exclusively is frequently followed by scurvy in mild or severe form, depending upon the duration of its administration and the age of the child at which it was begun. These facts point to the desirability of using raw whole milk for infants and of adding some antiscorbutic food to the diet as soon as possible. The best substance to add is the juice of oranges.

Excessive Feeding the Cause of the High Percentage of Infant Mortality.—J. B. McMahon (*New Orleans Medical and Surgical Journal*, February, 1918) believes that too much and too frequent feeding is the cause of a vast majority of gastrointestinal diseases in babies, rather than the quality of the milk. He says: "When I am called to a case of summer diarrhea, I stop all feeding for twenty-four hours or longer, with the exception of a little fruit juice occasionally, thereby giving the stomach a rest and nature a chance to eliminate the pathological condition, and then, if I can succeed in having the little patient properly nourished, he soon recovers with very little, if any, medication."

The Value of Triple Typhoid Vaccine in Civil as Well as in Military Life.—Randolph Lyons (*Southern Medical Journal*, February, 1918) thus summarizes his paper: 1. Paratyphoid infections are more common than generally supposed. 2. The disease has a death rate from one to four per cent. with much the same complications as typhoid. 3. Practitioners should corroborate the clinical diagnosis of typhoid with blood cultures or serological tests in order to differentiate typhoid and paratyphoid infections. 4. Boards of health should classify typhoid and paratyphoid infections separately in order to determine the relative prevalence of paratyphoid infections in a given community. 5. A mixed triple typhoid vaccine gives ample protection against typhoid, at the same time protecting the individual against paratyphoid "A" and "B." It should supplant the simple typhoid vaccine in communities where paratyphoid infections exist. 6. If such a vaccine were generally employed in civil life the morbidity from fevers of unknown origin and many so called typhoids with negative bloods would be greatly lessened. 7. In military life such a vaccine is rapidly becoming a necessity.

Simultaneous Ligation of Arterial and Venous Trunks.—E. M. Cowell (*British Medical Journal*, May 5, 1917) records six cases of injury to one or both vessels in an extremity in which both were ligated simultaneously. Recovery was excellent in five and in one subsequent amputation was necessary on account of sepsis. This method gives better results than ligation of the artery alone.

Hypodermic Administration of Sulphur.—L. Bory and A. Jacquot (*Presse médicale*, March 29, 1917) state that in treating various skin disorders they resort to intramuscular injections of the following preparation in the buttock:

℞ Sulphuris præcipitati puri,	0.2 gram;
Eucalyptolis,	20 c.c.;
Olei sesami,	0.50 c.c. M.

These injections, administered in the dose of two to five c. c. are well borne, causing no pain and little or no local reaction.

Iodine Vapor Treatment of Gonorrhea.—D. Morell (*La Cronica Medica de Valencia*, February 25, 1917), being impressed with the bactericidal action of iodine upon the gonococcus even in a solution of one in four thousand, has tried it in a number of cases of active gonorrheal urethritis. The irritative and coagulating action of alcohol precluded the use of the tincture and finally Morell decided to use pure iodine in the form of vapor. This method would seem to be worthy of extended trial.

Aposthesine.—This is a synthetic anesthetic resembling in a general way stovaine and particularly novocaine. Chemically it is the hydrochloride of gammadiethylaminopropylcinamat. It is produced in the form of small white crystals, having a melting point of 137° C. It is readily soluble in alcohol, slightly soluble in acetone and ether, and very soluble in water. The aqueous solution is neutral to litmus. It is precipitated from its solution by alkalis and the ordinary alkaloidal reagents. It has been tested by physiological methods and its anesthetic power has been proved to be as great, if not greater, than that of novocaine, while its toxicity is considerably less.

Arsaminol.—This is the name given to the Japanese make of salvarsan which is prepared in the laboratories of Sankyo & Co., in Tokio, under the supervision of Doctor Suzuki, according to the method invented by him in collaboration with Doctor Nakanura and Doctor Goto. This product is subjected to both biological and clinical tests by Doctor Hata, of the Kitasato Institute, before being placed on the market. It is described as a yellowish powder, easily soluble in water, with strong acid reaction. The powder, though more or less variable in the size of the grain and color, is said to be always the same in its essential qualities, but specimens which present brownish or darker colors must not be used, as the appearance of such a pronounced color indicates decomposition. Dr. Jokichi Takamine, of New York, who is interested in Sankyo & Co., has been granted a license to manufacture salvarsan in the United States under the title of arsphenamine. A similar license has also been issued to the Herman A. Metz Laboratories and the Dermatological Research Laboratories.

Limitations of the Crushing Operation for Calculi.—D. Rafael Molla (*Revista de medicina y cirugia practicas*, May 14, 1917) says that the operation of crushing is easy in the case of ordinary calculi and possible in the harder stones providing that the following conditions exist: large meatus, urethra of large calibre, normal prostate, healthy and non-irritable bladder, careful preparation, and as complete anesthesia as possible. Disinfection should be sustained before, during, and after the operation by abundant irrigations with weak antiseptic solutions.

Hemorrhagic Disease in the Newborn.—Oscar Robertson (*Ann. A. M. A.*, February 23, 1918) reports the successful treatment of this condition in an infant less than two days old by the direct injection of paternal blood through the superior longitudinal sinus after all other methods of treatment had failed, including the intramuscular injection of the same blood. The blood employed was freshly drawn into citrate solution and about 200 mils were injected. The method was easy and did not appear to be associated with any danger if the insertion of the needle was made with care.

Cyanocuprol.—This is a compound of cyanogen and copper, the use of which has been proposed by Doctor Koga for the treatment of tuberculosis. It is a colorless, transparent solution with a neutral reaction, and is put up in ampoules containing four, six, eight, ten, sixteen, and eighteen c. c. respectively. It is administered only intravenously, causing severe pain and swelling if introduced into the tissues. The solution decomposes on exposure to the air. It is prepared by the Kitasato Institute, of Tokio, the American agents for which are the Takamine Laboratories, of New York. It is understood that only experimental quantities have been imported so far.

Nerve Implantation between the Ends of Divided Nerves to Promote Regeneration.—J. Horsmann (*Optical and Microscopical Notes for Correspondents*, *Brit. Med. Soc.*, Jan. 1, 1918, January 19, 1918) finds experimentally that the best regenerative results are obtained by the implantation between the separated ends of divided nerves of a piece of nerve of the same animal or of an animal of the same species. He also finds that it is immaterial what nerve is used for implantation. He considers this the only method experimentally verified, as he has not found the method suggested by Edinger, the use of tubes filled with agar between the nerve ends, to stand the test.

Eusol.—This is made according to Penhallow, *Military Surgery*, page 70, by shaking up twenty-five grams of eupad with one litre of water, allowing the mixture to stand for a few hours, after which it is filtered through cloth or filter paper. Eusol may also be made by adding 12.5 grams of bleaching powder to one litre of water, shaking up vigorously, adding 12.5 grams of boric acid in powder, shaking, allowing to stand over night and filtering off the clear solution. Eupad is made by grinding in a mortar ordinary bleaching powder and mixing with it an equal quantity of boric acid. It will be seen that this is but a crude form of Dakin's solution, the formula for which was printed in the *NEW YORK MEDICAL JOURNAL*, November 25, 1916.

Miscellany from Home and Foreign Journals

The Supernumerary Cusp of the Upper Molars as an Indication of Syphilis.—E. Jeanselme (*Bulletin de l'Académie de médecine*, January 15, 1918), in relation to the supernumerary dental colliculus on the inner aspects of the first upper molars, recently asserted by Sabour, to be an indication of inherited syphilis, points out that this peculiarity of dental conformation, also known as the tubercle of Carabelli, is to be found in forty to forty-five per cent. of all subjects examined, though only in fifteen to twenty per cent. is it so pronounced as to form a distinct excrescence. Jeanselme, upon special study, found the tubercle frequently in negro and Asiatic races, American Indians, and Pacific islanders; also in skulls from the paleolithic and neolithic periods, skulls from ancient Egyptian tombs, and in six among nineteen well preserved skulls from the twelfth century recently unearthed beneath the city of Paris. Of 122 soldiers examined, twenty-two, or seventeen per cent., had a well developed Carabelli tubercle, and in but two of these was the Wassermann reaction positive. Present views as to the history of syphilis in Europe do not accord with the hypothesis of the tubercle as an evidence of syphilis. The tubercle appears to be a vestige of the system of adventitious denticuli which is well developed in lemurs and certain simian species. Apparently, therefore, it is of no value as a sign of inherited syphilis.

Mitral Stenosis in Military Practice.—J. Denis (*Presse médicale*, January 10, 1918) asserts that a large number of instances of slight mitral stenosis, both in military and civil practice, remain unrecognized. Under war conditions, such lesions do not permit of the necessary physical exertions—marching, training exercises, etc.—and the result is a series of functional disturbances in various organs, the cardiac origin of which, however, is by no means obvious. The most frequent functional results concern the respiratory apparatus, the manifestations being attacks of apical congestion with hemoptysis and persistent chronic bronchitis with poor general condition. Most military surgeons in such cases suspect tuberculosis. The subject being given a period of rest, the condition improves and he is likely to be sent back to active service, only to return later with fresh “pulmonary” symptoms. One subject was thus returned to service and later brought back five different times. If he had been transferred to some service requiring less active physical exertion, the condition would have cleared up permanently. Some cases suffer especially from dyspeptic or intestinal disturbances. For the detection of the slight mitral stenosis, quiet examination in recumbency is essential. The bell of the stethoscope should be applied at the inner portion of the third left intercostal space, almost over the sternum. On palpation, the apex beat is found nearer the sternum than normally, in the fifth, or oftener in the fourth, interspace. A slight thrill is felt over the apex. Auscultation yields at first the impression of an abnormal, indistinct, and confusing cardiac rhythm. The first sound is lacking in sharpness,

and upon careful listening, a rolling sound, low in pitch, is detected preceding the first sound. The true presystolic murmur is less common, and, when present, appears to exist alone. Reduplication of the second sound is audible above the apex, at the level of the inner part of the third rib and almost in the median line. It is inconstant, and is best heard in recumbency. Pachon's oscillogram reveals a low blood pressure, with very small oscillations. Many of these patients complain of feeling generally weak. The condition may not interfere with arduous physical work—as in agricultural laborers—if time is no object. In the hurry and stress of war conditions, however, the pulmonary circulation soon becomes overburdened, causing obstinate bronchitis, hemoptysis, apical congestion, and digestive and even renal disturbances. In the last five months, in a series of somewhat over 600 cardiac examinations, Denis asserts he has observed 110 cases of uncomplicated mitral stenosis, including especially the slight form just described.

Lithiasis with Bilateral Renal Involvement.—W. F. Braasch (*Boston Medical and Surgical Journal*, February 28, 1918) found on reviewing the records of the Mayo Clinic from January 1, 1910, to October 1, 1917, that sixty-two patients had been operated on for bilateral nephrolithiasis, and, during the same time, 504 patients with unilateral lithiasis, making a percentage of 12.3 of bilateral lithiasis in the operative cases. But this does not show the exact proportion in which bilateral nephrolithiasis occurs because, to do this, it would be necessary to include all cases which for any reason were not operated on, all cases in which ureteral stones on the opposite side had been previously removed, and all stones passed spontaneously from one or both kidneys and ureters. Practically twice as many cases of bilateral and of unilateral nephrolithiasis occurred in males as in females. The average age of the patients was forty years, the average duration of symptoms nine. Pain was located definitely in both sides in only fourteen cases, to one side in twenty-six, to one side recently with a history of more or less definite pain on the other in fourteen, and renal pain was absent in eight. Bilateral stones were found most frequently in the pelvis and calices. Combined renal functional tests were of practical value only when normal or extremely low. To ascertain the comparative degree of function in the two kidneys, the functional test was of value only when it was zero or a trace, normal, or excessive. The functional test, x-ray examination, and cystoscopic inspection may be insufficient in determining the degree of healthy renal tissue remaining, and exploration only can determine this. The kidney with acute complications should be operated on first; without acute complications, the kidney with the better function should be operated on first; occasionally simultaneous bilateral operation is advisable. Patients may be inoperable because of renal insufficiency, secondary infection, kidney destruction, or constitutional complications. Those with large bilateral stones causing no

symptoms or complications are better without operation. The operative mortality in this series of cases was zero; the total number of deaths within a year after operation was ten. The operative mortality with calcareous pyonephrosis is much greater than with other forms of bilateral lithiasis. The recurrences in cases of bilateral nephrolithiasis were twenty per cent.; in unilateral lithiasis ten. When there is stone in one kidney the most common form of disease in the opposite one is pyelonephritis, pyonephrosis, or hydronephrosis. With unilateral lithiasis the opposite kidney may be so badly diseased that a preliminary operation may be advisable on that kidney. Stone, secondary to pyelonephritis, when removed, prevents further renal destruction, but is not of curative value, and when the nephritic element predominates, removal is not of much therapeutic value. A single kidney has a great degree of tolerance for repeated operations for stone. In a single kidney the phenolsulphonophthalein output usually remains high in spite of the presence of an uncomplicated stone, probably due to compensatory hypertrophy. Fused or horseshoe kidneys permit of repeated operations for lithiasis which may, if necessary, include heminephrectomy.

Acidosis in Shock, Hemorrhage, and Gas Infection.—W. B. Cannon (*Jour. A. M. A.*, February 23, 1918) shows that where there is low blood pressure in shock, hemorrhage, or gas bacillus infection there is a diminution in the available supply of alkali and hence an acidosis, which generally is the more marked the greater the reduction in the blood pressure. Since the blood sugar is usually somewhat above the normal in these cases the acidosis is not due to lack of circulating carbohydrate. Operations in shock and acidosis cause rapid fall of blood pressure and sudden decrease in alkali reserve, and, although this may not follow the use of nitrous oxide-oxygen, this anesthetic is not trustworthy as a means of avoiding its occurrence. Intravenous injection of sodium bicarbonate produces quick relief of acidosis and a rise in the blood pressure in shocked men after operation.

Pneumococcus Type Determination in Sputum.—Charles Krumweide, Jr., and Eugenia Valentine (*Jour. A. M. A.*, Feb. 23, 1918) describe a very rapid and simple method by which suitable samples of sputum can be employed directly for type determinations and give definite results in half to one hour. Only such samples of sputum as will coagulate more or less firmly when immersed in boiling water for several minutes are suitable for the test, but such can usually be secured if care be taken to obtain a specimen raised by vigorous coughing. From three to ten mils of the sputum are placed in a test tube which is immersed in the boiling waterbath until the sputum is firmly coagulated. The coagulum is then broken up with a platinum or glass rod and saline added if necessary in order to secure a small amount of fluid. The tube is returned to the waterbath for a few minutes to extract the soluble antigen, and is shaken several times while heating, to facilitate this extraction. The clot is then thrown out by centrifuging and the supernatant fluid is used for the tests. Two-tenths mil of each of the first three type serums is placed

in a narrow test tube, and, by means of a teated pipette, a small amount of the antigen is layered over the serum in each tube. The tubes are put into a waterbath at 50 to 55° C., for a few minutes and then read. A definite, cloudy contact ring will appear in the appropriate tube if a fixed type of pneumococcus is present. After twenty minutes the tubes should be shaken to bring out definite clouding or precipitation at once or after further brief incubation. This method not only has the advantages of ease and rapidity, but permits the prompt administration of serum to the patient if it be discovered that he has Type I infection, thus saving many hours of valuable time in treatment.

Fibroid Tumors of the Vulva.—V. N. Leonard, M. D. (*Bulletin of the Johns Hopkins Hospital*, December, 1917), reports twelve cases, and gives a summary of the literature on this subject. Tumors of this type may reach a larger size than superficial fibroid tumors in any other part of the body. They usually grow rapidly and become pedunculated. They are affected by the vascular changes accompanying menstruation and pregnancy, as is shown by their swelling and sensitiveness during these periods. This accounts for their occurrence usually within the childbearing period, their rapid growth, and their usual degenerative changes. Nearly one fifth of these tumors become sarcomatous.

Concerning a New Theory for Diabetes Insipidus.—Gründmann (*Berliner klinische Wochenschrift*, 1917) and *Korrespondenz-Blatt für Schweizer Aerzte*, January 26, 1918) reports the case of a man, members of whose family had died of diabetes mellitus, who presented the symptoms of an idiopathic diabetes insipidus. He also presented a marked hypersensitiveness to thyroid substance, a fact which led to the suspicion that relations existed between the diabetes and the thyroid gland. The increased secretion of urine appeared to depend on a causal central irritation because it could be controlled by opium. Further studies showed that the vegetative nervous system of the patient was more irritable than that of a healthy man, and that a mixed form of vagotonia and sympathicotonia was present. The increased diuresis is explained by this abnormal condition of irritability of the vegetative nervous system, particularly of its sympathetic portion. The primary cause of such a condition of irritability lies in a disturbance of the internal secretion of the hypophysis, of the thyroid, of the suprarenal capsules, and of the pancreas, the former of which give rise to a sympathicotonia, while the pancreas hormone causes vagotonia. The carbohydrate metabolism of the patient was normal, while the hormones of the hypophysis, the thyroid, and the suprarenal capsules were in a state of equilibrium with the hormone of the pancreas. The frequent occurrence of diabetes mellitus in the family of the patient suggested a disturbance in the function of the pancreas. Trial also showed that therapeutic administration of food poor in salt and nitrogen was useless, while on the contrary the use of tincture of opium and of pilocarpine was to be recommended. Organotherapy with extract of the hypophysis was likewise unsuccessful.

Tonsillectomy in Diphtheria Carriers.—C. C. Ballantyne and B. S. Cornell (*British Medical Journal*, November 24, 1917) report the immediate cure of six persistent diphtheria carriers by enucleation of the tonsils. In all of the cases the tonsils were sectioned and cultured and it was found that the organisms were located in the very deepest parts of the organs in four, and in the other two only slightly more superficially and quite inaccessible to any form of local application.

An Occlusive Dressing Material for Wounds.—Chassevant (*Presse médicale*, November 29, 1917) recommends a mixture of one part each of paraffin and beeswax with five parts of light colored colophonium. The mixture is fused on a water bath and applied to the point of complete occlusion, the wound having been previously cleansed and aseptized with iodized chloroform. This procedure is considered particularly appropriate for varicose ulcers, burns, and wounds with deep recesses.

Hernias That Disqualify for Military Service.—Joseph Colt Bloodgood (*Jour. A. M. A.*, Feb. 23, 1918) directs special attention to the fact that there is a type of inguinal hernia which disqualifies its victim for military service whether operated upon or not. This is due to the fact that even after operation there are from twenty to fifty per cent. of recurrences. This hernia can be recognized readily by insertion of the finger into the inguinal canal through the invaginated scrotum. The patient should be lying flat on his back and one should feel for the conjoined tendon which will obstruct the passage of the finger and deflect it upward and outward. Where the finger meets no obstruction it indicates absence of this tendon and it is this type of hernia which should be the cause for absolute rejection. Even the most improved methods of operating in this form of hernia the recurrences have been reduced to only fifteen to twenty per cent.

Circulatory Failure.—Carl J. Wiggers (*Jour. A. M. A.*, Feb. 23, 1918) investigated the phenomena observed in animals as the result of circulatory failure brought about by several different factors in order to throw light on the mechanism and treatment of shock. When the failure was induced by shock from exposure and manipulation of the intestines it was characterized by a fall in arterial pressure, a low peripheral arterial resistance, a reduced venous pressure, and a deficient systolic ventricular discharge. The conditions associated with circulatory failure due to prolonged arterial hemorrhage were found to be precisely like those just outlined. Failure produced by prolonged vasodilatation, as with the nitrites, showed a marked reduction of arterial pressure, little or no effect on the effective venous pressure, and an increased rapidity of the heart which led to an increase in the pulmonary arterial pressure. The circulatory failure following acute cardiac failure showed progressive fall of arterial pressure, fall of pulmonary arterial pressure, increase in right auricular pressure, and moderately steep rise in intraventricular pressure. Artificial fat embolism caused a fall in mean arterial pressure with increased venous and pulmonary arterial pressures. Thus the experiments showed that the com-

bination of low venous pressure and a falling arterial diastolic pressure were conditions typical of circulatory failure due to shock or hemorrhage only. Treatment should be directed to overcoming the diminished arterial resistance and replenishment of the deficient venous return. The use of vasoconstrictors and intravenous infusions were, therefore, both sound procedures, but if fat embolism, as suggested by Porter, was the cause of wound shock they were irrational and dangerous through overdistension and failure of the right heart.

Clinical Observations on the Hemoglobin after Operation.—George R. Dunn and H. M. N. Wynne (*Bulletin of the Johns Hopkins Hospital*, January, 1918) found that before and shortly after operation the hemoglobin readings show very little change, the immediate postoperative reading even showing some increase over the preoperative figure in some cases. The hemoglobin curve usually reaches its lowest point from thirty to sixty hours after operation. The greatest drop is generally from twenty-four to thirty-six hours after operation, and occurs most quickly when salt solution infusions have been given. When only a slight loss of blood has occurred at operation the hemoglobin readings are usually higher during the first twelve hours after operation than before, and there is little decrease at any time.

Diagnosis of Infarction of the Entire Spleen.—Frank Nuzum (*Journal A. M. A.*, February 2, 1918) points out that this condition has received but little attention, only twenty-eight cases having been cited in the literature. To these he adds four of his own. The symptomatology is definite and characteristic, including pain in the splenic region, tenderness in the left hypochondrium, enlargement of the spleen, and occasionally some fever and hematemeses from the dilated gastric veins. The etiology of the condition is vascular obliteration from such causes as external pressure by tumors, torsion of the vessels in ectopic spleens, thrombosis, and embolism of the artery, the vein, or both. Embolism of the splenic artery seldom gives rise to infarction of the entire spleen. The treatment, whether medical or surgical, will depend largely upon the condition of the patient and the nature of the disease to which the infarction is secondary.

Trichinosis Simulating Meningitis.—Jacob Meyer (*Jour. A. M. A.*, March 2, 1918) calls attention to the fact that, while there are several reports of the finding of trichinae larvae in the spinal fluid, there are few recorded cases in which there have been meningeal symptoms. In this connection he reports three cases of his own, all in children, and all occurring in the same family, in which the spinal symptoms were pronounced. In two of the three cases larvae were found in the cerebrospinal fluid, the fluid also showed increased numbers of lymphocytes, varying between forty and 240 per cubic millimetre, reduced Haines's solution, and gave a positive Ross-Jones test. The meningeal symptoms included headache, stiffness and rigidity of the neck, positive Kernig sign, loss of knee jerks, and soreness of the muscles, a picture simulating meningitis or poliomyelitis. In all the cases more or less typical symptoms of trichinosis developed later.

Proceedings of National and Local Societies

THE NEW YORK ACADEMY OF MEDICINE.

Stated Meeting Held January 17, 1918.

Dr. EDWIN B. CRAGIN, Vice-President, in the Chair.

Hay Fever and Asthma, and the Uses and Limitations of Desensitization.—This paper, by Dr. ROBERT ANDERSON COOKE, of New York, is published in full in this issue of the JOURNAL.

Dr. HERBERT S. CARTER, of New York, stated that he approached this subject, as an internist, with a good deal of hesitancy; the mere nomenclature was enough to make a stout heart quail. The matter of chronic anaphylaxis, however, had to be reckoned with as well as the question as to the amount of dependency to be placed on what the laboratory men were teaching regarding it. The gross effects of anaphylaxis were known to all physicians, but many of its aspects interested the internist, particularly the effects of anaphylaxis in minimal doses. Before this subject was put on a firm basis, many patients were sent from pillar to post after the general practitioner had done his best, and the neurologists, rhinologists, dermatologists, and so on were called upon when the internists failed to relieve the conditions. Having these cases put in one large group of sensitizations had been of great advantage in practical medicine, and when eventually all was clear that it was possible to know of immunity, the problems of anaphylaxis would be solved in full. Doctor Cooke had given such a complete picture of anaphylaxis and the subject of desensitization that the speaker did not attempt to add to it, but merely indicated some of the problems which faced the internist. For instance, there were still certain cases of anaphylaxis, particularly the obscure asthmas, that left much to be desired. In these, after the full round of skin tests, no protein could be found that gave a positive reaction and the physician found himself in the same position as before. These were the cases one regarded as hopeless but if persistent trial revealed the agent that sensitized these patients, favorable therapeutic measures could be instituted. If none could be found, only the empiric measures of food elimination, etc., could be employed with the discouraging effect heretofore met.

By far the most important aspect of this question was not alone the effect of anaphylactic shock, but the remote effect upon the parenchyma of the various organs that repeated acute and chronic anaphylactic shocks might have though giving no outward evidence of occurring. Here the particular interest of the internist was aroused for in the solution of this question might lie the answer to many of the so called chronic degenerative processes. A long list of workers had added to the present knowledge on this point although the subject was, of course, only in its infancy. Gay and Southard had gone over this matter of the effects of anaphylactic shocks on the organs and shown that such hemorrhages were due to lesions of capillary endothelium, principally fatty changes, and waxy changes or fragmentation of the heart

and skeletal muscles as well as local necrosis of the epithelium, round cell infiltration of the kidney, and fibrous thickening of the glomerular capsula. Longcope had shown the effect of acute anaphylaxis upon the bloodvessels and that in the heart the same necrosis, round cell infiltration, and scar tissue formation occurred, producing the appearance of interstitial myocarditis. It was enough merely to mention these findings to show the vast possibilities they revealed, and it was not a long step from that to the more hypothetical question whether these small shocks might not have as bad an effect as the grosser ones. It was possible that in cases of degeneration of kidney, heart, or liver many might be traced to the phenomenon of repeated minimal anaphylaxis. If that were so, the field of preventive medicine was opened up to a series of possibilities as to what could be done to prevent these degenerative processes. As an illustration, in men who had been great smokers all their adult lives and in middle age were obliged to give up tobacco, it was possible sensitization in an anaphylactic sense had taken place. Again, in many people who habitually consumed certain quantities of beef, repeated ingestion of this protein might act in the same way in time. So there was in this idea the possibility of perfectly tremendous fields of work in preventive medicine.

Another question which presented itself to the internist's mind was that of the fall of blood pressure in many diseases, particularly in acute infections, notably pneumonia, which was fearfully regarded as an expression of depression of the vegetative nervous system and for which the toxemia was commonly blamed. The effect of toxemia on this system was ordinarily one of stimulation with raised blood pressure, as Pottenger had shown, not depression, while it was known that the anaphylactic phenomenon affected the greater vagus with consequent fall of pressure. Manwaring showed that the fall in blood pressure in the dog that accompanied anaphylaxis was not due to the direct action of foreign protein on the sensitized bloodvessels, but probably was an indirect phenomenon due to the explosive formation or liberation of depressive substances by the liver, resulting in vasodilatation and bronchodilatation with consequent fall of blood pressure and pulmonary edema and exitus, in pneumonia. That was suggested in explanation of this condition which was dreaded so much.

As to desensitization, the impression was general that a few of the patients who suffered from chronic anaphylaxis were entirely relieved, some were merely rendered more comfortable though not entirely free of symptoms, and some showed no relief. This left much to be desired in the way of sure promise of complete relief from symptoms. The efforts at desensitization were undoubtedly in the right direction, but there were still missing links in some of the chains.

Dr. OSCAR M. SCHLOSS, of New York, said his own experience with bronchial asthma in children had been confined to cases of sensitization to food

proteins. For statistical purposes he had divided them into two groups: 1, cases coming under observation on account of a definite history of symptoms of protein sensitization, such as angioneurotic edema and urticaria, etc., among them being bronchial asthma: there were forty-two such cases; and, 2, eighty-nine children or infants suffering from bronchial asthma on whom tests were made with various proteins and only four positive results obtained. The conclusion was reached that bronchial asthma due to food proteins was relatively rare.

Regarding the origin of the idiosyncrasy, such cases as occurred were either inherited or acquired. Doctor Cooke stated that in the cases in which the idiosyncrasy was produced artificially the state of sensitization was mild; the work of Longcope was in accord with this statement. The speaker did not agree that an acquired sensitization through ingestion might be taken in the same sense as artificial sensitization. He had seen three cases in which the symptoms were of pronounced grade; his evidence for believing it was acquired was that there was no family history and, secondly, these children had ingested the food, to which they later developed idiosyncrasy for some time before toxic symptoms were manifested. Opportunity for sensitization was present in many individuals at certain times. It was shown by Lust, Schloss, Worthen, and others that at certain times unaltered protein could pass through the gastrointestinal mucosa of infants and produce sensitization. Experiments of Wells had some bearing on this subject; he found that certain groups of guineapigs could not be sensitized to a protein of a certain type, zein, from corn, and found they had been fed corn previously. By carrying out the experiment he was able to demonstrate that sensitization was acquired. With egg white, the speaker found that guineapigs passed through a state of sensitization and later a state of immunity; if given injections of protein at certain stages they reacted, but if the food were continued they did not react, nor was it possible to sensitize them actively to egg white. There must be a previous disposition to explain why relatively few people acquired sensitization of any magnitude. Patients with food idiosyncrasies could be desensitized by feeding the offending protein, but it took time and considerable quantities of the protein must be fed. The speaker's experience had been entirely in accord with Doctor Cooke's in that unless the patients ingested these foods continuously they would again become sensitized. If sensitization did recur, however, it was present in a milder degree and could be more easily corrected.

Dr. MARK J. GOTTLIEB, of New York, agreed with Doctor Cooke that artificial desensitization was not very prolonged; he had discovered this after one experiment he tried on himself. Two years ago there was a discussion as to whether pollen extract deteriorated on standing. Having at the beginning of summer a quantity carried over from the previous year, he injected 0.5 c. c. into his arm to test it. No toxic symptoms occurred, but at the beginning of the hay fever season he had some mild symptoms which disappeared shortly and did

not return the following season. There were cases in which there were no hay fever symptoms, but in which asthma was manifested during hay fever time. Last year the speaker had a patient whose skin did not react to any of the pollens to which it was exposed, but did so violently after direct contact with the mucous membrane of the nose. That led to the question whether the mucous membrane was desensitized by the injection of pollen extract given under the skin when the sensitized cells lay in the mucous membrane of the upper respiratory tract. In such a case, there was failure to effect a cure even though tremendous doses were injected. Investigations were now being made with a view to direct sensitization of the nasal mucous membrane.

Doctor COOKE closed the discussion by explaining that perhaps he had not sufficiently emphasized the fact that this subject was so new that so far the surface only had been scratched, and further, what little had been done was subject to considerable amendment and much more carefully improved technic in every particular.

THE AMERICAN PROCTOLOGIC SOCIETY.

Nineteenth Annual Meeting, Held at New York, June 4-5, 1917.

The President, Dr. JEROME LYNCH, in the Chair.

(Continued from page 527.)

Adenomyoma of the Rectum.—Dr. FRANK C. YEOMANS, of New York, said that the following case appeared to be unique: Mrs. V., French, aged thirty-seven years, the mother of two healthy children, was seen in consultation in September, 1916, for rectal hemorrhage and pain. The important points of her history were: pulmonary tuberculosis (?) six years before, cured; menses painful, the flow diminishing; always constipated until three years ago. Then occurred an attack of diarrhea lasting five months, and thereafter intermittent attacks. During the past year she has had ten to twelve movements daily, containing blood and mucus. Pain over sacrum was aggravated at menstrual period and with the diarrhea. Physical examination showed a pale but well nourished woman, weighing 142 pounds. Wassermann test of the blood was negative. Urine was normal. Chest and abdomen were negative. Rectal examination: Three and one half inches up on the anterior rectal wall, just above cervix uteri, the finger felt a hard, fixed, fairly tender mass, the limits of which could not be defined. Proctoscope showed a superficial ulceration, the size of a quarter, at the rectosigmoidal juncture. This was red, clean, and bled freely on contact. Vaginal examination was negative except that in the posterior fornix the same mass was felt apparently the size of a guinea hen's egg. At operation, September 26, 1917, a left rectus incision was made. No growths were found in the liver or other abdominal viscera. The tumor was located in anterior wall of sigmoid just above its juncture with the rectum and extended down two inches on rectum, cervix uteri, and posterior vaginal wall. The lower third of the sigmoid was

mobilized, including a small portion of the posterior wall of the uterus and its cervix, and the superior hemorrhoidal artery was ligated. Then the abdominal wound was closed and in lithotomy position the operation was completed by a typical Genu-Tuttle extirpation of the rectum, including the posterior vaginal fornix. The patient reacted promptly from the immediate shock of the operation. The bowels acted on the third day and union of sigmoid to the perianal skin was primary except at one spot, which soon granulated. The patient left the hospital in three and a half weeks and was now well, having normal anal sensibility for bowel actions, which occurred once or twice daily with normal control. Vaginal and rectal examinations showed no abnormalities.

Interest in this and similar tumors in this location centered in their origin, symptoms, diagnosis, prognosis, and treatment. Suggested origins are uterine mucosa, Wolffian ducts, and "embryonic rests persisting from the fusion of Müller's ducts." The author's case was clinically an intestinal growth. Dr. James Ewing, after careful study, reported "the most likely origin is from superfluous material derived from that portion of the lower gut which continues on in the embryo to the bladder and allantois, and which normally atrophies. Persistence of a portion of this segment would furnish a source of smooth muscle and intestinal epithelium. I do not think the tumor is of Müllerian origin." Varying with the development and site of the growth the symptoms would be: obstructive, dysenteric, or neuralgic. In respect to diagnosis, the tumor imparted a rather characteristic feel. It was apt to be mistaken for infiltrating, inoperable malignant growth. As regards prognosis, histologically the tumor was benign. Clinically it might be malignant from the symptoms to which it gave rise, or actually underwent malignant change. It should be removed surgically at the earliest date possible. The abdominal route was preferable but, if the tumor was at the rectosigmoidal juncture a combined operation would probably be necessary for its removal, as successfully done in the writer's case.

Pellagra, the Pellagrous Intestine, and Pericolic Veils.—Dr. JOHN L. JELKS, of Memphis, Tenn., described rectocolonic conditions in pellagra. From his observations in pellagra, which he had held for seven years it was an infection beginning in the intestine in a similar manner as typhoid fever; he contended that in all active or acute cases of pellagra he found pathology in the intestines commensurate with other symptoms. He described the prodromal and the late symptoms and both the early and late pathology observed by him. The speaker described the intraabdominal as well also the gut pathology in the different stages. Pellagra seldom developed in sanitary and screened homes, and he believed sanitation, isolation, and the elimination of raw vegetables as a diet and effectual screening would control pellagra. He referred to the fact that the negroes and poor whites in his section had more money, and more to eat and a greater variety of diet than they ever had, yet that pellagra was increasing rapidly in the outlying districts about Memphis, though it seldom extended

over into the sewered and screened section of the city proper. The speaker referred to a recent ordinance that had passed in the city of Memphis requiring doctors to report all cases of pellagra and to exercise the same precautionary measures in these as in cases of typhoid fever.

Neoproctology, a Glimpse Into the Future.—Dr. JEROME MORLEY LYNCH, of New York, stated that we could say that proctology was a new field of effort. It was practised centuries ago. In early records the cutting of a fistula and the ligature operation for hemorrhoids were described. While, therefore, technic offered no novelties, physiological surgery afforded a most promising field for the further development of proctology. The observations of the ancients were remarkably accurate, and, considering the limited amount of detailed knowledge at their command, were as wonderful examples of the power of human induction as many of the best conclusions of the modern day. Consider, for example, their decision that a hemorrhoidal flux was in some cases to be regarded as beneficent. Whether or not the cause was known, as we understood it today, to be hepatic cirrhosis or right heart engorgement, still, for all, the observation was based upon as sound philosophy as could possibly be adduced today. It was well for us, in the occasional mental stock taking, which was periodically forced upon us, to bear in mind that the tendency of modern scientific instruments of precision, together with all the wonderful array of laboratory tests, while of indisputable value, were in a certain sense of greater value to the patient than to the physician; for they certainly tended to take from the latter the necessity for that keenness of perception and correlative interpretation of symptoms, which was the distinguishing characteristic of the earlier physicians whose chief reliance was their own mental activity.

A Case of Idiosyncrasy to Quinine and Urea Hydrochloride.—Dr. COLLIER F. MARTIN, of Philadelphia, Pa., reported a case of toxic symptoms appearing in a patient from an injection of three mls of a ten per cent. solution of quinine and urea hydrochloride. The symptoms complained of by the patient were swelling of the hands and feet and numbness of the extremities. For a few hours there was some difficulty in respiration, associated with a tendency to fainting and nervous perturbation. Later a urticarial rash developed, covering the entire body, associated with intense itching. The attack subsided in about two days, leaving the patient with no alarming symptoms. The patient had had two previous experiences, and certainly should have informed her physician of her susceptibility. The case was cited simply to note one of the complications which might occur when using this drug.

Nonurgical Treatment of Splanchnoptosis.—Dr. ROBERT C. GIBSON, of Philadelphia, W. Va., while not going deeply into the etiology, pathology, symptoms, and diagnosis of splanchnoptosis, called attention to the necessity for treatment first along conservative lines of medicinal, personal and mechanical aids in this condition rather than the surgical treatment usually offered. Normally, the viscera were held in place by their respective supports and intra-

abdominal pressure, these being aided by proper poise of the body. In splanchnoptosis the poise was bad, with resulting loss of intraabdominal pressure and of supporting visceral attachments. Splanchnoptosis was divided into simple and complex: simple when there were no restraining adhesions and the organs were returnable to their normal positions; complex—extravisceral—when they were retained out of place by adhesions and were not, therefore, returnable to their normal places. Our endeavor should be to restore viscera to their normal places and maintain them there. This was to be accomplished by personal efforts of the patient by correction of posture, certain abdominal exercises, massage, vibration and hydrotherapy, and medical treatment as indicated after gastric and enteric analyses. Other means were external or mechanical, such as shoulder braces, abdominal supports, corsets, etc., modified to suit the patient, and raising foot of the bed. Attention was called to the difficulty of obtaining proper and constant support to thin individuals with small abdomens and prominent hip bones, with suggestions for modifying the usual mechanical aids offered.

Neglected Rectal Examinations.—Dr. JAMES A. McVEIGH, of Detroit, Mich., stated that a thorough rectal examination was a source of comfort to the patient and satisfaction to the doctor. It enabled the latter to make a correct diagnosis and advise proper treatment. Rectal examinations were not difficult and should be ocular, digital, and instrumental. The physician should never accept the patient's diagnosis. This was not infrequently done and such an unscientific procedure usually produced an unsatisfactory result. Indifference and carelessness on the part of medical men in conducting rectal examinations were being rapidly lessened, owing largely to the influence of the American Proctologic Society. The remedy lay in persistently reminding the men engaged in general practice of the necessity of making thorough rectal examinations whenever indicated, and the men who were following this special line of work were the ones who must be most active in conducting this campaign of education. Very often examinations were not made on account of pressure of time; false modesty on the part of a patient or lack of office equipment. Not enough attention was paid to the fact that a foreign body might have been left in the rectum at a former operation.

Letters to the Editors.

AN EFFECTIVE METHOD FOR DROPPING ETHER IN EMERGENCY.

ELMIRA, N. Y., February 19, 1918.

To the Editors:

An effective and simple method for administering ether by the drop method is the utilization of the screw cap cork from a Johnson & Johnson Synol Soap bottle, or any similar screw cork. If screwed down tightly it will seal the bottle. By loosening the screw cap one or two turns it may be regulated to drop as slowly or rapidly as desired.

CATHERINE PATTERSON,
Nurse, Dr. N. H. Soble's Office.

Book Reviews.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

Lord Lister. By Sir RICKMAN JOHN GODLEE, Bt., K. C. B., F. R. C. S. London and New York: Macmillan & Co., Limited, 1917. Pp. xix-676. (Price \$6.)

In one sense, at least, the life of Lord Lister appears very appropriately at the present time, for it emphasizes two facts of fundamental importance in the history of modern medicine. These are that Pasteur revolutionized medicine by his studies in bacteriology and gave the hint to Lister which brought about the corresponding revolution in surgery. When the distant future shall look back on our time these are the two names that will stand out above all others. Owing to conditions not now easy to explain, there was a very general impression prevalent until recently in our generation that modern medicine and surgery in their practical development owed most to the Germans. Here is the demonstration of how mistaken that persuasion was. If to the names of Lister and Pasteur be added those of Jenner, Metchnikoff, Charcot, Ramon y Cajal and a few others it will readily be seen that to a very great extent German work in medicine was a mere building up of structures on foundations that had been laid broad and deep by men of other nationalities.

The volume is written by Lord Lister's nephew, who lived for many years in close personal contact with him and who assisted him in his operations in London and was entrusted with a large part of the care of his private patients. The biographer thinks this an unfortunate relationship, but most of his readers will surely fail to agree with him. He was somewhat handicapped by the fact that Lister expressed the hope, though without imposing the obligation, that his biography might be a simple record of what he had done for science and for surgery, but his nephew says very properly "this is out of the question, for he was a public benefactor, and the world has a right to know something of the inner life of one who achieved so much in its behalf." On the other hand the biographer surely had the advantage of following Lister's work and its effect upon surgery for full fifty years. That of itself ought to make his record invaluable and such I think readers will be sure to find it.

Very few of our generation realize what a revolution in surgery was worked by Lister's discoveries and, unless they are aware of certain facts, can scarcely understand the immense difference between the surgery of our day and that of a generation ago. How illuminating are these figures taken from Lord Lister's life. The Glasgow Royal Infirmary in which his work was done contained in 1865 400 beds for general purposes and altogether 310 operations were done in the year. In 1913 with 665 beds, somewhat more than one and one-half times as many, there were 7,093 operations, that is, more than twenty-three times as many. What was true of Glasgow was exemplified elsewhere. St. Bartholomew's, the largest hospital in London, had about 400 surgical beds and the annual number of operations for the five years preceding 1865 was 379, about one-fifth of which were amputations. There are fewer surgical beds at St. Bart's now, but the year before the war there were nearly ten times as many operations and less than one in every hundred an amputation. As a matter of fact, surgery in the first half of the nineteenth century had reached one of the lowest ebbs in its history. No wonder, too, for the hospitals were old and dirty the nursing utterly unorganized, and how could the poor surgeon do anything without a mortality that was prohibitive.

The most curious thing about this state of affairs is the tradition that when Lister married Syme's daughter, Syme at the time being looked upon as one of the greatest of British surgeons, his father-in-law expressed regret that the son-in-law would not be able to look forward to any great advance in surgery. The old man felt that surgery was now a thing fixed and settled, and no

chased widely, not only as an example of what American publishers can do, or as an encouragement to the efforts of the author, but because of the intrinsic importance of the subject itself. The present war situation has increased cases of hyperthyroidism enormously, showing the psychogenic element of fear to play a transcendent rôle in the causation of this disorder. It is especially auspicious that a monograph of this type should appear, even though the psychic element is summarized under the meaningless term "nervous."

Medical Bacteriology. By JOHN A. RODDY, M.D., Associate in Hygiene and Bacteriology in Jefferson Medical College; Chief Assistant, Department of Clinical Medicine, Jefferson Hospital; Professor of Hygiene and Bacteriology, Philadelphia College of Pharmacy, etc. With Forty-six Illustrations, of Which Eight are Printed in Colors. Philadelphia: P. Blakiston's Son & Co., 1917. Pp. xi+285. (Price \$2.50.)

This work contains the basic principles and technic common to all branches of bacteriology as well as a few procedures of the first importance in each speciality. It is recognized that while an intimate knowledge of general bacteriology in all its ramifications better fits a man to take up any particular phase of the work, the subject is so large that it is impossible to include it in a single volume. Therefore it has been the aim of Doctor Roddy to deal only with the essential elementary parts of the subject. It matters not whether the intention is to devote oneself wholly to bacteriology or to take up independent work, the beginner must be grounded in the basic principles. It goes without saying that the author is particularly well qualified to write authoritatively on the subject, for, by virtue of his position, he possesses a full knowledge of the needs of students, practitioners of medicine, pharmacists, and those engaged in the foodstuff industries. This textbook for beginners and laboratory guide is a model of conciseness and clarity of expression. The chapter dealing with the Wassermann and other complement fixation tests is especially excellent. The book, which is well arranged and beautifully illustrated, may be warmly recommended to those who are anxious to become thoroughly conversant with the groundwork of general bacteriology.

Materia Medica, Pharmacology, Therapeutics, Prescription Writing. For Students and Practitioners. By WALTER A. BASTEDO, Ph. G., M. D., Assistant Professor of Clinical Medicine, Columbia University; Associate Attending Physician, St. Luke's Hospital, New York; Attending Physician, City Hospital, New York, etc. Second Edition, Reset. Philadelphia and London: W. B. Saunders Company, 1918. Pp. 654. (Price \$4.)

The second edition of this praiseworthy volume differs from the first in two major respects only; first in being brought into conformity with the new, Ninth Edition of the Pharmacopœia; second, by the inclusion of discussions of some of the newer remedies, such as the Carrel-Dakin treatment, papaverine, ethylhydrocuprein, and others. Although both the United States and British Pharmacopœias have adopted the term millilitre, or mil, in place of the cubic centimetre, from which it differs very slightly, Bastedo has followed the general trend of recent books and retained the cubic centimetre on the ground that it is better known and almost universally used in medical literature. In a work so comprehensive as a large volume on pharmacology and therapeutics it would be impossible to review in detail all the good points and point out defects or obscurities of presentation, and in this one the latter two points are so insignificant as not to require any mention other than to say that they are well nigh absent altogether. It is true that there are isolated statements with which we cannot quite agree and that the author seems to have misread a statement now and then, but these instances are of very minor importance and are common to all of the best works on pharmacology, since the subject is one in which interpretation of observed facts plays an important rôle. Now that we have unburdened ourselves of all that we can see to criticize even slightly unfavorably, we would express our deep debt of gratitude to the author for his very able applications of pharmacological knowledge to therapeutic practice. This feature, more than any other, makes this book stand out among works on pharmacology, for it makes the science of

drug action subserve the ends of the practical physician. We are quite familiar with all the worthwhile pharmacologies in the English language and we know of none in which the practical relationship of pharmacology to therapeutics is better presented. From the viewpoint of the student of pharmacology the book deserves commendation because of its succinctness and clarity; from that of the student of therapeutics, because of its rational discussion of this phase of the subject; and from that of the general practitioner, because it not only gives the best in therapeutic practice, but also shows the reasons for the employment of the agents recommended and gives the fundamental facts of drug actions which go to make therapeutics logical and rational rather than purely empiric and hence difficult to master. The publishers also merit a word of commendation because of their excellent workmanship in making up the book and especially in reproducing the many tracings and figures with unusual clarity.

The Exceptional Child. By MAXIMILIAN P. E. GROZSMANN, P. D., Educational Director of the National Association for the Study and Education of Exceptional Children. Containing a medical symposium with contributions from a number of eminent specialists. New York, Boston, Chicago: CHARLES SCRIBNER'S SONS, 1917. Pp. xxxiii+764. (Price \$2.50.)

At first glance one is bewildered by the vast profusion of material in the 800 pages of this book; and deeper investigation increases the confusion. There is so much that is either nonessential, obvious, or repetition, that the small amount of undeniably valuable material becomes lost. Dr. Grozsmann is a prolific and insistent writer on pedagogic subjects. His school for exceptional children (as it is euphonically put) does not suffer, of course, by his literary activities. To produce this book, authorities and others have been ransacked and quoted liberally, cases of the author have been presented at length, and piecemeal dissertations on civilization, education, feeble-mindedness, delinquency, and mental tests have been plastered together with a rather thin cement of coherence and intelligible purpose and the whole padded out by a number of articles by writers of varying prominence and given the title of a "medical symposium." The result is a large quantity of chaff with a small amount of worthwhile grain. Furthermore, italics are used so lavishly that their value is lost, and no particular point stands out clearly.

Births, Marriages, and Deaths.

Died.

- AUSTIN.—In New York, N. Y., on Tuesday, March 19th, Dr. David Penfield Austin, aged eighty-three years.
- BOWEN.—In Fall River, Mass., on Saturday, March 2d, Dr. Seabury Bowen, aged seventy-seven years.
- BROWN.—In Chicago, Ill., on Tuesday, March 12th, Dr. Richard Hunt Brown, aged fifty-five years.
- DAWSON.—In Eldridge, Cal., on Monday, March 4th, Dr. William Joseph Gremley Dawson, aged seventy-two years.
- GLEASON.—In Salt Lake City, Utah, on Thursday, March 7th, Dr. William T. Gleason, First Lieutenant, Medical Reserve Corps, U. S. Army, aged thirty-nine years.
- HENRY.—In Bentonville, Ark., on Saturday, March 2d, Dr. James T. Henry, aged seventy years.
- HOWES.—In Hanover, Mass., on Thursday, March 7th, Dr. Clarence L. Howes, aged seventy years.
- HULL.—In Cleveland, Ohio, on Friday, March 1st, Dr. George Earl Hull, of Mantua, Ohio, aged thirty-nine years.
- KING.—In Des Moines, Ia., on Friday, March 8th, Dr. Azuba Doty King, aged eighty-one years.
- MEWBORN.—In Macon, Tenn., on Friday, March 1st, Dr. Walter Alva Mewborn, of Bells, Tex., aged fifty-nine years.
- PALMQUIST.—In Chicago, Ill., on Thursday, March 7th, Dr. Luther Titus Palmquist, aged thirty-seven years.
- RUSSELL.—In Jersey City, N. J., on Saturday, March 9th, Dr. Oscar J. Russi.
- SCOTT.—In Chicago, Ill., on Monday, March 4th, Dr. Lancaster F. Scott, aged sixty-seven years.
- WILLIAMS.—In Macon, Ga., on Friday, March 1st, Dr. Howard J. Williams, aged sixty years.

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LUES AND THE WAR.

From an Unaccustomed Angle.

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There is an impression abroad in the land today that syphilis is conquered and that salvarsan has achieved the miracle. This is shared by the credulous laity ever ready to swallow wonders, and by immature clinicians of brief experience—brief, not limited. Many of these men would consider themselves misrepresented and insulted, if charged with limited experience. They loudly proclaim the large number of cases they treat in a year and the splendid results they obtain, but they are mostly young men who have not followed their cases far enough to determine whether the results are permanent or not. In the very nature of things their testimony is incompetent. It can only apply to immediate consequences and not to remote.

You will find statisticians who hotly maintain the "cure" of syphilis, on the persistence of a negative Wassermann reaction two years after the conclusion of a series of injections. You will find these same statisticians acknowledging the persistence of a positive reaction after the conclusion of a most intensive course of salvarsan. Furthermore, they are forced to admit that the brilliant "eradication" of the infection is rather a rare phenomenon. The other eventuality is rather the usual one. After reviewing these considerations we are still of opinion that we cannot affirm the "cure" of syphilis until sufficient time has elapsed to remove the possibility of paresis and ataxia. That means the passing of many years. If lues delays to strike the neuroglia, for thirty years after the primal infection, there is no certainty that it may not strike it thirty years after the assumption of "cure" by salvarsan. Time alone can prove the soundness of this position. Any other position at this time is based on pure assurance.

The evidence of the Wassermann reaction is not always decisive. While the positive results are indefeasible, unfortunately the negative are not. It is conceded that the cerebral and spinal cells may be attacked, with a clean report from the blood. So disconcerting is this that the extraordinary explanation is vouchsafed that the nervous system is invaded

by the spirochete in the very first breach of the patient's defences. The complication invariably last in point of time is here assumed to be first in point of origin. This flies fairly in the face of experience, and unless it can be supported by unimpeachable evidence, cannot lay claim to serious consideration. It is significant, however, as indicating how bald is the presumption that syphilis is "cured" because the Wassermann remains negative. Syphilis is not "cured" while a man is liable to tabes or paresis. And no one can assert absolutely that either of these may not develop, even in the cases pronounced clean by the serologist, until as many years have passed as the period marking their latest appearance under the discarded method of management. If a way of retreat was contrived from an embarrassing situation by this preposterous hypothesis, it is an admission nevertheless that the embarrassing situation may occur, even with everything staged to suit the therapeutic optimists. That is a confession that salvarsan cannot be depended on to cure syphilis.

Let us not forget that the real horror of syphilis rests not in its disfiguring manifestations, nor in its deprivation of the special senses, nor even in its arterial degenerations, but in the devitalization of the functioning tissue of the brain and cord. The living death of paresis, the helpless, hopeless, harassed life of tabes, are the consequences that impress the Scriptural admonition that "the wages of sin is death." Here we have death to the mind as well as the body. And it is just these consequences that our medication cannot promise to avert.

We are wrought up at times by brilliant accounts of arrested tabes, following the intraspinal injection of salvarsan. Enthusiasm takes the place of judicial calm and utters prediction of complete success. We are almost shaken in our conviction that the thing cannot be done. A little farther on, if the historian is frank and sincere, doubt begins to show its grinning face and the best forecast is the maintenance of the advantage already gained. As tabes is not a stationary condition and as it has its periods of spontaneous recession or pause, the ascription of trifling amelioration to the treatment employed and the founding thereon of extraordinary expectations are utterly unjustified. If tabes is not "cured" by the intraspinal injections the halt effected is of dubious value and significance. Tabes uncured is tabes inexorable. Its progress will be steady whether swift or slow. It will "get"

its victim. Candid investigators who care more for scientific accuracy than for temporary notoriety, admit that once established nothing can thwart it of its quarry. They hope to forestall its establishment, however, by the vigorous administration of salvarsan and mercury.

As all victims under the older method did not acquire paresis or tabes, it is difficult to understand just how the amount of prevention under the new method is to be estimated. If all patients who receive salvarsan, in the measure demanded, escape involvement of the cord and brain, the case is made out. But we have seen that this will call for observation over a long term of years. If any patient treated with salvarsan, in the measure demanded, is stricken with tabes or paresis the whole argument falls, for the others who escape may do so for the very reason that many escape who have never taken salvarsan, and not for the reason that they have taken it. Conditions of natural resistance peculiar to the individual are operative under both circumstances. The hypothesis that the nervous system is exceptionally attacked at the onset of the disease, before salvarsan can be brought to influence it, but that the destructive effects are delayed many years, admits that, once involved, the condition is hopeless, and is, taken seriously, about as trivial an artifice as sober investigators could be expected to resort to. Fairly stated then, the case for salvarsan leaves tabes and paresis in doubt. In other words, we do not know whether we ever head them off or not, because we do not know whether they would have occurred or not. We do know, however, that we do not cure established cases.

With tabes and paresis in doubt, the warning against syphilis retains its terrible gravity. No one who contracts the disease is safe from these horrifying sequelæ. Nothing that we can do, no expedition that we may employ in doing it, no constancy that we may display in pursuing it can insure us against the dreaded spectre standing over every syphilitic. Every syphilitic is a potential tabetic, a potential paretic. What saves so many passes our understanding. Who of the number affected will terminate his career in the wheel chair or the madhouse? This hazard darkens the horizon of every one of these stricken sensualists. We recognize indeed that some are really stricken deer, for the enormity of innocent contamination is by no means rare, but in the vast majority of cases the victim has got just what he went after. He sought indulgence at any cost, and the cost was high. The evasion of his moral obligations and the degradation of the women who ministered to his desires, counted nothing in his reckoning of values. Nature in striking her balance figured with impartial exactitude. For the wasted procreative energy she returned tabetic impotence. For blighted virginity and cheated maternity she returned paretic dementia. For the excesses committed under the attraction of variety she enforced chastity on a body raging with concupiscence. It is as idle to deny and deride these conclusions as it is to deny the retribution overtaking any other disturbance of her orderly procedures. The sage materialist will smile with superior tolerance at this transcendental effervescence.

He will murmur "hysteria" and contemptuously dismiss the subject.

Let us pause a moment over this matter of "hysteria" and "transcendentalism." Millions of men are today afflicted with this same "hysteria" over a transcendental abstraction. For the utterly ideal object of patriotism, they are undergoing gruelling privations, sustaining torturing wounds, and surrendering their lives. There is not a material inducement compounding their devotion. From every consideration of material welfare they are distracted and unwise. It is unquestionable that a full surrender to the demands of the enemy would prevent the horrible physical injuries which they are incurring and insure them a life of security and comfort. For, granted all she demanded, the enemy would extend to submissive peoples the more or less paternal toleration which she has exercised over her own. From the point of view of selfish calculation the mad resistance of these flamboyant patriots is insane, it is plain ordinary hysteria and transcendental frothing. And yet millions of them are at it, throwing away their lives and fortunes, sacrificing limbs and senses, severing bonds of tenderest forging, rating home and hope and future as inconsequential counters to the ideal love of country. May not men of this kind rise to any height of selfabnegation in other fields than those of war? Are we to believe that, properly presented, the question of social vice and its retribution will not appeal to their better feelings? Cynics will jeeringly point to the prevalence of lues in the army of these devotees, as proof of the impossibility of coercing libidinous desire. Granting all they charge, their case is not made out.

Men have been improperly instructed. They have been given to understand by materialistic teachers that the satisfaction of their desires is a necessary and therefore a permissible and commendable safeguard of their health. Other phases of the subject were not emphasized. Poisoned with this doctrine by the very men who later decry all efforts at moral restraint, our youth do not realize that their courage is equal to the task of defeating the ambushed enemies of their better selves, as well as the physical enemies massed in the trenches. Encouraged to fornication by shortsighted physiologists and narrow gauge psychologists, a habit of thought is implanted according perfectly with their animal impulses, and the inevitable consequences are entailed. Resistance to sexual impulse is credited with tremendous nervous casualties. "Man was meant to copulate." Therefore let him copulate. This is what the man on the street calls "great stuff." It would be if it were true. But like many another specious sophism its enticement is due to what the syllogists call an undistributed middle. "Man was meant to copulate" is not a full statement of the terms, but "Man was meant to copulate for the propagation of the race." When he loses sight of that qualification, he is soon floundering in a morass of birth control, abortion, and race deterioration, for which Nature occasionally pays him in kind by robbing him completely of the power of procreation. He becomes the victim of mental and bodily incapacity preventing the satisfaction of the very desires that have destroyed him.

The history of orderly decent cohabitation of the sexes is the history of the home, of health and happiness, of steady racial development, of steady national ascendancy. The history of disorderly, illicit cohabitation is the history of the brothel, of disease, of misery, of steady racial deterioration, of steady national decay. Nature, defeated of her purpose, strikes back with pitiless fairness. Her purpose in sexual intercourse is maternity. Every device to cheat her of the merited increase entails a penalty whose accumulations have produced the horrors of prostitution and lues. As a rational deduction the only course by which the venereal diseases may be successfully combated, is to heed the warning against what the theologians call the "occasions of sin." If we permit, extenuate, justify, or in any way encourage the indulgence that brings the youth within the influence of the prostitute, amorous or commercial, we shall waste time and energy in attempting to prevent the consequences. Given prostitution, you will garner syphilis. It is thus that the obscene malady originated. It will flourish like the green bay tree under the same conditions. It is unscientific to attempt to remove an evil while tolerating its cause. It would seem superfluous to present this obvious proposition to the highly trained minds who strangely favor the merely animal attitude of man toward his sexual promptings, but it is a lamentable fact that on this particular subject they are guilty of the grossest inconsistency. They are struggling frantically to leave man his irresponsible pleasures and relieve him of the inevitable accounting. They are drenching him with spirocheticides at one end of the line while permitting the retention of luetic hotbeds at the other! They are, in the parlance of the day, "playing both ends against the middle." In sanitizing Havana General Wood found it absolutely necessary to get rid of the filth accumulated throughout the city. It would have been a curious method of procedure for him to attempt to fight the yellow fever germ while permitting the existence of its incubators. In every extension of sanitary science except that dealing with venereal diseases this principle is inflexibly maintained. But when we approach the hallowed ground of man's prescriptive pleasures, we are abashed and deterred by the sacrilegious suggestion of meddlesome interference, just as the authorities in India are timid of checking the indiscriminate bathing of the Hindus in the Ganges. We throw up our hands and weakly admit that prostitution is necessary because copulation is necessary, and all men able to copulate are not able to marry. Thus it becomes a privileged thing, a fetish, a sort of divine institution; for if necessary it is of God. This sounds like hyperbole, but it is the plain exposure of the thought in the sugared expressions of the defenders of fornication.

It is easy to see that young men inducted into this sort of moral (?) philosophy will follow the inclinations of their lower nature without compunction. Restrained perhaps by their conceptions of right and wrong from forcible exaction of female compliance, they can see nothing immoral in what is freely offered or paid for. There is no consideration to deter them but the property right of a

woman to her own body and the injustice of compelling her to surrender it without compensation. They will even concede that seduction is immoral, for whereas the woman yields voluntarily, after more or less urging, she has been in a manner carried by storm and against her cooler judgment. She has been despoiled by her partner of what he can never restore. She has been debased in her own estimation and, made a pariah, if detected, among the respectable women of her class. She has been subjected to the risk of a humiliating maternity, and perhaps initiated in the career that terminates in the gutter. All this to supply the momentary gratification of an animal craving, followed usually by a feeling of disillusion or even of repugnance which Nature arouses in order to obviate excess. The element of injustice is clear enough here to halt the impetuosity of many an ardent wooer. But, where there is no question of the violation of personal right, where both sides are ready for the adventure, it is difficult to make men understand that prostitution is a serious offense against morals, a perversion of Nature's purpose and the cause of all the disasters summed up in the word syphilis. They realize that they are "taking a chance" in indiscriminate intercourse, but they do not realize that they are rendering themselves liable to merited punishment for wilful misdoing. Sadly misinformed from the beginning, it is not remarkable that they are credited with lack of resistance. They have not been taught to resist. They have been permitted to succumb. False philosophers, dull witted physiologists, and ill informed companions have influenced an education that might just as easily have been properly directed and manfully acquired. Not being impractical dreamers we do not hope that such an education could be widely approved and generally adopted without meeting with determined opposition and many deplorable lapses. Youth is hot and youth is reckless. But assisted by counsel of selfcontrol instead of weakened by counsel of selfindulgence, youth would make a better fight for the preservation of its health and self respect.

No more convincing evidence of the laxity of male convictions on matters sexual could be adduced than the tone of the conversation at gatherings exclusively of men, or of gentlemen, if you please. It is so generally recognized that most men are given to what is popularly styled "smutty" talk that no one feels the least embarrassment in broaching it. It is accepted as the usual thing. Now surely our advocates of "nonresistance" do not pretend that there is any imperative impulse in man to talk smut. Whatever he may be forced to do in the way of sexual intercourse he is under no compulsion to talk about it. That is a gratuitous retasting of the delicate morsels that he has enjoyed. He is licking his lips over the recollection of the pleasure he was compelled to take. The talking of smut is more significant of moral depravity than the actual extramarital coition, because it reveals a delight in doing the thing that is justified only upon the assumption of irresistible natural forces. The honest man who should hold to that assumption ought to be filled with regret at the harm he was

forced to inflict upon the ministers to his passion and ought to disdain the flippant discussion of such a painful topic. "Needs must when the devil drives" might serve as a sophistical excuse for seeking the prostitute but not for jesting about it afterwards. But this widespread propensity to joke of lechery shows more clearly than any other single indication how wretchedly inadequate and imperfect and wrongheaded has been the training of the young man in a matter bound up with such tremendous consequences. Had a different course been pursued who can venture to say that a different result might not been obtained? If he had been advised that sexual irregularity, no matter how urgent the temptation, foreboded greater suffering than self-control, a character of entirely different fibre would have been erected. If he had been assured that no matter how hard the effort to resist the pull of desire, his nervous system would not go to pieces, and his sexual apparatus would not atrophy, respect for himself and for female virtue might have gained the ascendancy.

This dissertation must not be taken in the light of an evangelical exhortation. Nothing is said of the punishment of fornication except that inflicted by resentful Nature. We are treading purely physical ground. We are discussing the question of the prevention and cure of syphilis. This is a matter directly within the province of the physician. No aid from any religious teacher is needed to make this discussion fruitful.

That religious conviction should coincide with purely natural induction, simply accentuates the soundness of the latter. The conscience of man speaking through his religious formulas and expressing the experience of ages of sensuality stigmatizes as sin the very offences which clinicians find subversive of health.

In relation to the subject in hand it would be well to give the *coup de grâce* to a miserable and dangerous sophism masquerading under the form of a famous quotation. There probably never has been a more insidiously seductive phrase invented than "Honi soit qui mal y pense." It is a hoary old pander justifying any and every appeal to sexual desire. Its peculiar malignity consists in its putting the blame of evil-mindedness upon every protestant against salacity. You see that a certain stage exhibition is vile in its parade of nearly naked women. You denounce it. Bang! You are hit in the face with this withering innuendo. You are held up to scorn as a loathsome prurient who can see only evil in a perfectly innocent study in art. You visit a certain gallery of pictures. You are nauseated by the redundancy of utterly naked women. You comment upon it. Again you are floored by the virtuous indignation of this imported aphorism. You begin to feel that you have a mind like a sewer and that all the real purity is in the devotees of Art. But is it not curious that Art has such a predilection for female subjects, and especially for certain portions of those subjects? Where it does not frankly give you the whole carcass it "plays up" particular regions with remarkable unanimity. Seriously there could not be a more appropriate inscription for the door of a brothel than this perverse

and perverting proverb. The evil does not rest in the mind of the observer but in the impression made upon it. Those who seek to impress it with licentious pictures, cannot shift the blame for the consequences upon the sensitive cells. We are all one clay. Purity of mind is not an essential part of our makeup. Inclination to libidinosity is in us. It is not quieted by tantalizing excitements. It is kept in subjection not by rubbing it on the raw but by the closest of discipline. Those who produce exhibitions which arouse it are perfectly conscious of the inevitable effects. And neither the painters of the nude nor theatrical managers can be held up as trustworthy teachers of morals or guides to right living.

It has been attempted to show that man's loose sex relations are due to his faulty education and evil environment and not to any inability to do better. We are not at all disturbed by the frantic protest of the wallowing materialist who proclaims all this as meddling, muddling, midsummer madness, certain to set all our young men masturbating and to reduce the race to a pallid, puny, pimply, set of degenerates. Dreadful! But we are not advocating a condition which should merely substitute one vice for another. We are advocating self-restraint. Choking one vent for unconquerable desire would inevitably open another, but the aim is control of the desire, in man. Who is to say with authority that this is impossible when it has never been tried except in isolated instances such as religious communities? Even now we must admit that every young unmarried man is not necessarily a masturbator or a fornicator. To pretend anything else would be ridiculous. Therefore self-restraint is not impossible. While not impossible there is no underrating the magnitude of the task of its wide inculcation. To be generally accepted as a rule of conduct it involves the reconstruction of the moral makeup of most of our young men. It is a pretentious contract. Nobody knows the extent of the difficulties until it is undertaken in earnest. Some hint as to its feasibility may be got from the health of our young soldiers, massed under conditions usually regarded as favorable to the propagation of venereal disease. Much ado has been raised by sensationmongers, about the awful conflagration of immorality raging among these splendid men. Innuendo, rumor, suggestion, and unverified suspicion have been the evidence adduced when the defamers were pinned down to facts. Mind you, no one is disputing the existence of vice in the army. It existed in many of the units that go to make up the army for the reasons that we have exhaustively explained, but to proclaim that men devoted to such a lofty purpose as the idealism of patriotic selfimmolation are the more readily incited to gross sensual indulgence is an offence to ordinary intelligence. Venereal diseases may appear and may spread among them, because those addicted to the habit of fornication, inclined thereto by the evil standards of morality implanted by false teachers, will seek occasion for the continuance of the practice and all resorting to the same limited source of gratification will run the risk of the same contagion. That is a very different state of affairs from the

orgy of immorality ascribed to the mere presence in camp of men released from the conventions of home. On the contrary, the solemnity of their mission, the uncertainty of their future, and the thousand and one considerations created by their altered situation, should have and doubtless do have a deterrent effect upon the ebullition of concupiscence.

We are in possession of General Pershing's report regarding the health of the men in France, and there, where the restraints ought to be the weakest, he declares that sexual disease is gratifyingly scarce. If the scandalous aspersion of the allied troops were true only in part, the German army should not have the slightest difficulty in massacring them, unless possibly the German troops were in a worse condition. Given a burlesque situation like that and the fighting would be of the most innocuous sort. As there has been some trifling exhibition of heroism and endurance in the progress of the conflict and as neither side has weakened from lack of efficient men, it is obvious that somebody has been lying about the incapacity brought about by recently acquired French syphilis. We will not offend by unreasonable optimism. We admit that the evil exists and will continue to exist in armies made up of units badly educated in the moral responsibilities of civil life. That the whole roster does not contract lues shows that the virtue of selfrestraint is practised by some.

That is our case epitomized. Selfrestraint is possible and preventive of syphilis. Ah! but restraint under the exaltation of a great devotion is one thing and restraint in the ordinary current of events quite another, objects the captious critic adroitly shifting his ground. It will never be possible to get men to forego their pleasures when they are drifting along on the same old stream of luxurious selfgratification. Probably not. But we purpose to show them that they must not drift along in that way any more. We purpose to show them that all attempts to satisfy passion without fulfilling a compensatory duty will bring inevitable retribution. Defrauding Nature of her due, stealing her pleasure and denying her price, seeking by trick and device to get the account all on one side of the ledger! In concrete terms, birth control, abortion, incontinence, and prostitution, the whole melange of obscene adjustments of natural processes to merely voluptuous aims, have been the cause of the titanic tragedy of Lues Triumphant. The world cannot be made safe for erotocracy. With one in the ascendant the other must perforce abdicate. Shall erotocracy rule and ruin, or shall mankind rise victorious from the struggle? If syphilis can be eliminated as a deterrent to debauchery by means of a successful therapeutics, the knell of fecund procreation will have been struck because the easier and irresponsible satisfaction of desire will be pursued by the now unterrified sybarite, *Facilis descensus averno*. The Romans recognized it. The descent to hell is easy, swift and inevitable by the route of illicit pleasure. The Romans gathered the bitter fruit of their neglected knowledge in the degeneracy which left them an easy prey to the hardy invader.

Curable syphilis would inspire very little fear, and the removal of that fear would be a grave menace to

the integrity of the race. Despite this, as physicians we could not but desire and seek the result which as thoughtful men we must dread. This position will be promptly assailed because utterly misunderstood. What? Favor the permanence of lues with its frightful train of mental and bodily evils in order to serve as a horrible example of the dangers of incontinence? We do not favor any such thing, but we shudder at the demoralizing effect on the male population of the passing of this menace. It is certain that if "they take a chance" now with the possibility of disastrous consequences, they will riot in untrammelled sensuality and commonly evade the responsibility of marriage when this course is known to be practically safe. The speedy result of this would be a rapid decline in the birth rate and the eventual extinction of the population unless the current were stemmed by a religious revival of higher moral standards.

Those who know have no illusions on the motives actuating most men to assume the burdens of matrimony. Ideal love may hypnotize a few. But back of the vast majority of marriages is the thrust of sexual desire seeking gratification without the risk of contracting disease. The quest for money influences some also; but in the world at large such a motive has comparatively small play. We have no quarrel with this impulse. It was put in us for the propagation of our kind. It is normal and right. It impels women to incur the pains and dangers of childbearing. It impels them to make the various unconscious sex appeals to men that incite them to desire a more intimate relation. This all means race development. It is a phase of the law of procreation. It is not to be frustrated or denied. Its seemly and orderly operation is beneficent. But let us not forget that it entails the duty of maternity and the care of a family. This is the thing that pinches and halts many a yearning couple. Economic difficulties, indisposition to assume the expense of a household, the cunning calculation that is revealed in the vulgar aphorism, "What is the sense of keeping a cow when you can buy milk by the quart?" these considerations tend to discourage the taking of wives and to encourage the hiring of prostitutes. With syphilis in the perspective, a powerful dissuader from the primrose path of dalliance is in our possession. Sexual attraction loses some of its charm when viewed in the shadow of tabes or ataxia. Even the hot desire of inexperienced youth may be cooled by a graphic recital of the ravages of lues. Fear comes to the support of the higher incentives to continence.

It is manifest that the cause of the almost universal prevalence of chastity among the young women of our communities is the fear that has come down to them through the ages of incurring the disgrace of illegitimate motherhood. The instinctive resistance to libidinous advances does not always present itself as fear to the indignant maiden. She is insulted and shocked and defends her honor to the last, even surrendering her life instead. Her honor is a high ideal to which she is striving to live up. If you say that she is struggling against merely personal injury, and is not defending a lofty abstraction at all, her resentment would be blister-

ing. And yet there is no gainsaying the fact that this fear of disgrace, of personal damage, of irreparable wreck, is the underlying motive of the lofty and admirable quality which we denominate virtue. In its passage through the centuries, it has become transmuted, by the touch of chivalry and the fire of religion, into an abstract conception entirely apart from all conscious worldly considerations. Thus we see that fear has kept half the human race morally clean. I have no patience with the quibbling that drags into the limelight the unfortunate victims of their own deplorable weakness or of man's deceit and brutality, and holds them up as refutations of the contention that women are cleaner than men. These examples are conspicuous because of their comparative fewness and the depth of their degradation. Prostitution, public or exclusive, does not comprehend an important fraction of the sex to which we respectfully raise our hats. What fear has done for half the race with perfect effectiveness and without any impairment of natural efficiency, fear may do for the other half if as vigorously impressed.

We cannot urge the fear of disgrace; for unfortunately the male does not consider sexual peripatetics a disgrace. On the contrary he is rather proud of his escapades and rather given to boasting of his prowess. If he gets a pathological memento of his amorous conquest he is inclined to be vain and broadly hint at it or openly discuss it among his cronies. This is the fault of his "bringing up." Had he been taught to know the terrible risks he ran in "taking a chance" he would have imbibed a wholesome fear of the disease he now heedlessly invites or imperturbably sustains.

The indomitable sexual impulse will brook no restraint. It will have its way. It will ride rough shod over every barrier in its impetuosity. It will sweep aside religion, reason, fear, shame, and mercy. It must be gratified. The cost is not considered. Never was a falsier argument based on as little actual fact. To begin with, why is it certain that what has always been must always be? Up to a definite historical point every wrong that has since been corrected "always existed." The domination of peoples by kings or dictators always existed until democracy began to make head against it. Democracy was viewed with distrust by the very decent people who cowered under despotism. Capital punishment for murder "always existed" till enlightened communities realized that another murder by the State did not atone for the first. Now some of these communities have no capital punishment and all communities have members who disapprove of it. Slavery was once a universal institution. It was recognized as of God by the churchmen of its heyday. Yet slavery now is eliminated from the economic systems of all civilized countries. Alcoholic intemperance has always existed since man discovered the way to ferment his beverages. Yet a time arrived when doubt of its expediency began to be heard and now prohibition has succeeded in bringing Congress to its knees. Woman was a political vassal until the twentieth century. Now she has been enfranchised in a great many communities and bids fair soon to be enfranchised in all.

We have already disposed of the argument that the sexual drive is too powerful to be withstood. For the sake of emphasis we shall recall that this is false with regard to the female part of the population. It is also false with regard to men in religious confraternities. It is also false with regard to men whose minds are busy with matters of serious import, men whose emotions are aroused by a lofty ideals, men whose souls are burdened with grief, men whose sordid interests compel the closest circumspection. In the last class may be put the man with a chancre, who is forbidden to have intercourse for quite an extended period, two years at least. He sadly agrees, and for fear of the consequences to his own polluted carcass, keeps his word. The impossible has been accomplished! Continence has been practised by one of these helpless slaves to turgid seminal vesicles! The infected Lothario is brought up standing in midcareer by the shock of his disconcerting discovery and his craven soul vomits its lust at the thought of dire complications. He was just as capable of being scared before he contracted his chancre as afterwards. But no real attempt was ever made to scare him. He had been led to believe that any sexual favors he could get were his; that the risks in getting them were not as serious as the nervous effects of not getting them; that it was a perfectly natural and salutary thing for him to satisfy his sexual appetite as well as his hunger. He might be sorry for the unfortunates who were compelled to help him out, but it was a curious world anyhow, and he was not responsible for the way he was made or the things he was forced to do. If all that rubbish had been knocked out of his head before he ventured on his *tour de luxe*, he would not have had to learn its true character by the bitterness of experience. The sacrifice that he dejectedly agrees to under the shadow of a great disaster he might have had the merit of agreeing to under the prompting of a manly resolve. He does from cowardly dread of aggravating his disorder what he might have done in the blitheness of perfect health. The power to do it is clear to him after years of obstinate denial.

The only rational procedure in the move on the stronghold of syphilis is to rouse in the young man a repulsion for illicit sex relations. If this may be accomplished by the teachings of religion or ethics all the better. A higher motive than fear is thus incited. It will be prudent, however, to combine with this influence that of a wholesome dread of the consequences of incontinence. Who shall say that this may not be as salutary to the man as the fear of maternity is to the maiden? Who shall say that man thus alarmed and informed may not grow as chaste or as cautious as his sisters? Who shall say that this hitherto unemployed maneuver may not be the solution not only of the matter in hand but in a large sense of the vexed social evil? When did we ever expect to hear continence preached by the general commanding? Is not that a recognition of the principle advocated in this paper? If General Pershing advises his men to keep away from the women he makes two acknowledgments: first, that it can be done, and second, that it is the only way to prevent syphilis. Men

of his stamp do not waste time in useless discourse. If he suggests a course of action there is no doubt of its practicability. Taken in connection with his report already quoted about the health of his men his exhortation seems to have been helpful. Impressed with the magnitude of his responsibility, with the necessity of maintaining his fighting forces at the highest point of efficiency, both in numbers and morale, he sees with the clearness of the prophet that departure from the straight and narrow path will bring venereal disease and disability. He does not say, "My men cannot resist their desires. It would rack their nervous system to attempt it. It is better for them to take a chance. We can fix them up with salvarsan afterwards." Not a bit of it. He admonishes them to avoid the occasion of infection. That is exactly the idea we are trying to apply on a larger scale and over a longer time.

We have been concerned with the physical penalties of the violation of natural law and have touched upon the ethical aspect only as a prop to the argument. Something has been made and more could be made of the fervid spirit of the times when men are stirred as never before with unselfish consecration to lofty ideals. So much has been sacrificed on the altar of patriotism that it is inconceivable that the men who have done this are incapable of a less exacting selfdenial. So many of our splendid boys are marching with the colors, which represent to them the glorious culmination of their noblest aspirations, that it is sacrilegious to brand them "as of the earth earthy" and bond slaves to any animal gratification. If we would but see the angel that is in man, however overlaid with clay, we would never surrender our faith in his ability to rise to any heroic height. It is because we will not see anything but the clay, that we sneer at his weakness and deride the call to better things. This war has shown that not only individuals but whole nations may be heroes; that cowardice is the exception; that everything of value in the world is of trifling concern compared with the impalpable, intangible, invisible figment of the mind called duty. For this idea men will die; nay, not only die, but consent to live blind, lame, and helpless. Are not such men capable of subjugating their animal instincts to a corresponding sense of duty? It is only a question of acquainting them with that duty. If they are ignorant of it, naturally they cannot be blamed for not living up to it. If we will not admit this power of resistance to sexual impulse on the part of young men properly informed of the evil done and the risks run through illicit intercourse, then we may as well give up the hope of eradicating venereal disease.

The cause operative through centuries of varied civilization will continue operative to the end of the chapter. If it is afforded opportunities for its noisome activity they will not be neglected. This intimate relation between incontinence and lues cannot be dissolved. If we are content to take the consequences we may go on callously indifferent to the fate of the race. If we seek to evade the consequences by any prophylactic or therapeutic device, no matter how cunning or promising, we shall be inevitably disappointed. We shall find the further

we go in quest of the unattainable, that the barrier will rise higher than our longest reach. If man will rise superior to the brute from which he sprung, not only in stress of great exaltation, but in the regular tenor of his life; if he will respond to the urging of his higher nature; if he will repudiate the calumny that he is ruled by his distended seminal vesicles instead of by his Godlike reason; if with his feet planted upon the earth he will but raise his head above the clouds; if he will display in his round of humdrum duties a fraction of the courage and selfsacrifice that he displays upon the field of battle; then will the obscene offspring of sexual vice succumb and we may throw its physis, including salvarsan, to the dogs.

If this be Utopian, visionary, impractical, let us see wherein it is bettered by any of the "practical" compromises designed to let a man eat his cake and have it. If for our inspiration and our hope, we have wandered into the domain of the unselfish and ideal, we have only followed those who have invaded it with exultation in their hearts and guns upon their shoulders.

323 WEST FOURTEENTH STREET

EARACHE AND ITS MANAGEMENT.*

By RUFUS B. SCARLETT, M. D.,

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At this season of the year when human ingenuity is exercised to the utmost to escape the various infections usually prevalent, earache is sufficiently frequent and the consequences serious enough to make the discussion of the subject of more than passing interest to the general practitioner.

Earache, or pain in the ear, is lightly regarded by many of the laity, and its seriousness, with the attending complications, is not fully realized. This attitude is also unfortunately manifested by many family physicians, who seem to think that if the drum will only rupture and the ear discharge, all will go well. This liberal and optimistic attitude has undoubtedly cost the life of more than one patient, because of the faulty drainage resulting in mastoid infection, sinus thrombosis, or brain abscess. As commonly met with, the pain results from a definite infection of the middle ear, most frequently taking place through the Eustachian tube and often occurring as a complication during the course of one of the infective fevers. Measles, scarlet fever, pneumonia, influenza, smallpox, typhoid fever, cerebrospinal meningitis, and typhus fever have all had their recorded cases. While the winter months especially seem to claim a heavy toll, a certain number of cases occur during the summer as the result of bathing. The true origin of an ear pain, however, may be distant to the location of the symptoms. Careful examination may show it to be in the nose, throat, or mouth and yet manifested by distress in the ear through reflex action. This condition is not infrequently found as a complication in some of the diseases of the upper air passages. In children, the cause may sometimes be

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traced to an enlarged pharyngeal tonsil, commonly spoken of as adenoid, or to lymphoid tissue within the tubal orifice itself. Even an hypertrophied faucial tonsil, because of its position and character of enlargement, may cause obstruction and interfere with free ventilation and drainage through the Eustachian tube. To one who is doing much tonsil work, the complaint of the patient of pain in the ears for a short period following tonsillectomy is not uncommon.

A simple "cold in the head" may be the primary factor in causing the aural discomfort. With the turbinal bodies swollen and partially obstructing the nasal passages, the patient not infrequently will blow the nose violently to remove the accumulated secretions. In the performance of this act, one side of the nose is invariably held, and a more or less strenuous effort is made to clear the opposite passage. Therein lies the danger. Instead of the full volume of air finding an exit through the nasal chamber, a part of it, carrying infected secretions, is forced into the middle ear through the Eustachian tube. In like manner, the nasal douche, as commonly used, may be considered vicious and decidedly harmful. Sometimes a furuncle in the external auditory canal may cause the patient much distress and the attending physician considerable uneasiness before he is able to arrive at a definite and satisfactory diagnosis. Examination of the external canal through a speculum will invariably show the occlusion of the passage. The inability to see the tympanic membrane may also be evident, as the swelling is anterior to the drum head.

The character and location of the pain may be confusing in at least three conditions. 1. In furunculosis, it may be distinguished by the patient as anterior to the middle ear and as becoming more intense as the lobe of the ear is disturbed. 2. The distress in middle ear infection is usually centred in the ear, and not necessarily affected by motion of the lobe. 3. When the Eustachian tube is involved in an inflammatory process, pain and tenderness usually extend down the neck along the course of the tube.

Appearance of the affected drum.—Every general practitioner should be acquainted with the landmarks of the normal ear and should be able to detect the existence of any pathological condition of the drum or its neighboring structures. This will require familiarity with the use of the head mirror and the ear speculum. Inflammation within the middle ear cavity may show only redness and slight swelling of the drum, but with the appearance of fluid, usually pus, the normal landmarks are disturbed as the result of the bulging, and an inflammatory exudate is invariably spread over the outer surface of the tympanic membrane. Sagging of the upper wall of the external canal, corresponding to the anterior wall of the mastoid, should make one suspicious of involvement of the mastoid cells. Corroborative evidence, of course, should be obtained before making a positive diagnosis.

Treatment.—The first point in the consideration of the treatment is the relief of pain. A brisk saline cathartic is indicated, and rest in bed is

essential. Dry heat applied in the form of a hot water bag is usually acceptable to the patient. Moist heat is objectionable in that it seems to aggravate the condition. It favors venous engorgement, softens tissues, and hastens local necrosis, rather aiding the development of the process we are attempting to abort. Bloodletting by the application of leeches may be of benefit, but is now very seldom resorted to, preference being shown by most men for other forms of treatment. Attention to the nasopharynx and depletion of the tissues surrounding the orifice of the Eustachian tube is important, in order to encourage drainage from the middle ear. This will sometimes produce surprising results. An oily solution containing camphor, menthol, and eucalyptus may be used to advantage in the nose. The effect is at least pleasing to the patient. The dropping of oily solutions into the external auditory canal for the relief of pain is usually unwise and should seldom, if ever, be resorted to. The oil possesses little or no therapeutic value and only serves to obscure the parts for future examination. Sweet oil and laudanum, so frequently used by the laity and many physicians, is included in this class. Any virtue that might be claimed for this preparation is simply due to the heat of the solution, and this is soon dissipated. The epidermic covering of the external surface of the drum head does not permit free enough absorption for the laudanum to produce sufficient sedative action. There is no objection to carbolic acid and glycerin in a five or ten per cent. solution; in fact, this preparation is often advocated and seems to be frequently efficacious in the relief of pain. Many believe that the only indication for an oily solution in the ear is for scaly eczema of the external canal, or as a dressing for dermatitis. Sometime ago, J. F. Crump (1) advised in the commoner forms of earache in children the instillation every three hours of five drops of the following solution:

R Atropine sulphate	gr. ¼4;
Cocaine hydrochlor.:	
Phenol aa	gr. v;
Epinephrine (1:1000 sol.)	f 3i;
Glycerine	q. s. ad f 3iv.

He asserts that this preparation will relieve the pain in almost every case. I have never used it, so cannot speak for its efficacy.

At this point, it might not be out of place to suggest that in order to instill drops successfully into the external auditory canal, the patient should lie down or the head should rest horizontally upon a stand or table with the affected ear upward. The canal can then be filled, or, as much medicine inserted as desired (by means of a glass dropper). Entrance to the full depth of the channel is facilitated by gently moving the external ear in somewhat of a rotary manner, at the same time lifting it, in order to straighten the canal.

If the various applications do not produce the desired relief within twelve hours, an incision should be made in the tympanic membrane, and especially if the presence of fluid in the middle ear is detected. Those who have suffered the agonizing pain of an "earache" can readily appreciate the benefit of an

open drum. Even if no pus is obtained by an early incision, and not infrequently such is the case, marked relief, if not entire freedom from distress, is obtained by the depletion of the part as the result of the bleeding. It is now considered poor judgment and careless practice on the part of the physician to allow a patient to suffer, beyond a reasonable time, until the drum is ruptured by the force of the pus behind it. Such a perforation is harder to heal than if an incision is made, and frequently it does not furnish adequate drainage, thereby predisposing the ear to a chronic suppurative condition. A simple illustration may furnish the necessary emphasis. One does not have to exercise his imagination to any great extent to realize the fact that a handkerchief is more readily repaired following a knife thrust than if the perforation is made by a blunt instrument or one's finger.

Anesthetic.—In the great majority of cases, the operation of incising the ear drum can be done under local anesthesia. An extremely nervous child, however, who is apt to interfere with the delicacy of the operation, will require a general anesthetic. The canal is first prepared, and is best cleansed with a 1 to 4,000 solution of bichloride at a temperature of 110° F. Alcohol and hydrogen peroxide can be used for further sterilization. There is a possibility that the peroxide acts in furthering the absorption of the anesthetic by its macerating effect upon the tissues. The local application of solutions of cocaine, eucaïne, or alypin to an intact tympanic membrane produces little or no anesthetic effect. This is due to the dermic layer covering the external surface of the drum. If injected beneath the skin at or near the point of incision, however, anesthesia is likely to follow, but at the expense of a painful needle prick, which will probably be as distressing to the patient as a paracentesis or an incision without anesthesia. Efforts have been made to augment the anesthetic effect of the above mentioned substances by the addition of other drugs. The most satisfactory preparation known to the author is a combination of the crystals of cocaine, carbolic acid, and menthol. Most happy results have been obtained from its use. Many ear drums have been incised with very little or no discomfort to the patient. On one occasion, under its influence, a middle ear was curetted of granulation tissue without objection by the young Hebrew patient.

As previously mentioned, for the relief of pain, the use of a five or ten per cent. solution of phenol and glycerin may produce sufficient anesthesia for the necessary operation. Another preparation, consisting of cocaine crystals, anilin oil, and absolute alcohol, first suggested by Gray, of England (2), was extensively advocated a number of years ago. It was soon found, however, that toxic symptoms were liable to develop, especially in the presence of a perforation. Untoward results have been reported by Dupuy (3), Gray (4), St. Clair Thompson (5), and Packard (6). Sudden drop in temperature and marked cyanosis are the principal manifestations of the toxic condition. In case a general anesthesia is deemed advisable, any one of a number may be used without much after discomfort to the patient. Chloroform is frequently selected.

Ethyl chloride can be used to advantage, the patient going under quickly and regaining consciousness almost as soon as the gauze is removed from the face. Nitrous oxide has been advised, but its use is a little more troublesome. Halsted (7) strongly recommends the use of somnoform as an anesthetic for short operations, or preliminary to the administration of ether.

Instruments.—With the aural speculum properly placed and the field of operation well illuminated, a sharp pointed miniature bistoury is selected, with a straight or angular handle, depending on the choice of the operator. A dull pointed knife is unfit for use and should be discarded, as it tends to cause too much pain, even if a local anesthetic is used, and the wound produced is not a clean cut one.

Incision.—The opening in the tympanic membrane should be made at the point of greatest bulging. This is usually in the posteroinferior quadrant. A puncture, or paracentesis, as previously practised seldom suffices. A free incision is necessary in order to gain the desired result. If curved and made so that the greatest possible number of radiating fibres of the drum are severed, it will tend to promote gaping of the wound, and prevent too rapid closure. An incised wound tends to rapid healing, sometimes closing in thirty-six to forty-eight hours. Care must be exercised to avoid injury to the incus and stapes, and the point of the bistoury must not penetrate too deeply. The relief from the agonizing pain is almost immediate. The canal is mopped dry, and a small wick of gauze is loosely inserted, and brought in contact with the incision to encourage drainage. If not properly placed, it acts as a plug.

After treatment.—The so called dry treatment seems to be the best one to follow. This means frequent cleansing of the canal with cotton and the elimination of all moisture as much as possible. Subsequent care of the ear will depend upon the nature of the infection and the amount of the discharge. If the latter becomes copious, douching the canal with some mild antiseptic, as salt solution, boric acid, or weak bichloride, and then drying it thoroughly will tend to shorten the period of suppuration. Care of the nose and throat is essential to rapid convalescence. With the disappearance of the discharge from the ear and the healing of the drum, the trouble is not entirely eliminated. A certain relaxation of the drum membrane and intratympanic ligaments follows an inflammation of this character, and may result in the formation of adhesions in the tympanum and interfere with hearing, unless the necessary measures are instituted to guard against such complications. The middle ear should be carefully inflated, daily, at first, and then the interval gradually lengthened. Subsequently, as improvement is noted, the interval may be further prolonged until all traces of congestion have disappeared, the hearing has been restored, and the tympanic membrane retains its normal position.

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THE SURGICAL TREATMENT IN THYROID CONDITIONS.*

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The surgical treatment of thyroid diseases has been markedly improved in the last few years, both in preliminary preparations and in operative technic. The first decade of this century has added the treatment of diseases of the thyroid gland to the surgical side of our art. This applies more especially to that form of disease which had been most discouraging heretofore, and which now is one of the most satisfactory conditions to treat in the field of major surgery, namely, the disease generally known as exophthalmic goitre.

The surgical history of diseases of the thyroid gland is extremely meagre before the last quarter of the past century, when the remarkable work of Theodor Kocher attracted the attention of the entire surgical world by his practical demonstration, first in a few, then in hundreds and thousands of cases, that skillful thyroidectomy is not the extremely dangerous operation that the earlier surgeons had pictured. He largely eliminated the principal dangers from anesthesia, sepsis, hemorrhage, shock, hyperthyroidism, myxedema, injury to the recurrent laryngeal nerve, and injury to the parathyroid glands, and gave us a relatively safe surgical procedure. In many of these features, and especially in many of the details, much important support came from other sources. Moebius supplied a most important element for the rational surgical treatment of the important class of exophthalmic goitre by his logical and convincing studies, which made it clear that in this disease there is absorption of an excessive amount of substance secreted by a diseased gland which enters the general circulation through the lymphatic system. Rehn also pointed out first a quarter of a century ago the splendid effect of treatment of exophthalmic goitre, and Tillaux had pointed out similar results four years earlier, in the year 1880, although he had no definite theory by which he could explain the great benefit obtained by excision of the gland. There can be no doubt, however, that the surgical treatment of exophthalmic goitre resulted directly from the surgical work of Kocher in simple goitre and the pathological and physiological explanation of Moebius. In this, as in most other instances, the benefit of operative treatment of exophthalmic goitre was first observed accidentally in cases in which the goitre was removed, not to cure this disease, but to relieve pressure or deformity. To the development of the technic, much has been added by the work of Charles H. Mayo of this country who has the largest personal experience in the treatment of exophthalmic goitre at the present time.

One of the most important procedures attached to the surgical treatment of thyroid conditions is the preliminary treatment. This is especially true in exophthalmic goitre, and I shall attempt to discuss this treatment first. Exophthalmic goitre should never be operated upon immediately after the

patient's admission to the hospital or even a few days after admission. I think the minimum should be a week in early cases. The reasons for this preoperative rest are obvious. It allays the fear these patients usually have of a hospital, and they become accustomed to the surroundings and attendants; the absolute quiet they are urged to keep is the best factor we have to bring down the pulse rate, thereby giving tone to the heart muscle; they are put on the proper diet and eliminative treatment; and they are prepared for the anesthetic whether it is to be given by the inhalation or the rectal method, thereby avoiding sudden excitement from this particular source. By rest, I mean absolute rest in bed; the patient should not be allowed to sit up or to have company and the room should be kept dark with plenty of ventilation. We usually put them on a soft diet with sweet milk every two or three hours between meals. Saline, six ounces, glucose, one half ounce, and soda, one dram, should be given per rectum every six hours. This corrects a tendency toward acidosis which is often found in these cases. An ice cap should be kept over the region of the heart if the pulse is over 120. If it is very fast, one should be placed over the gland also. A very careful examination of the blood and urine should be made; the blood pressure should be taken every day, or every other day is often enough in the milder cases.

The next most important thing for consideration is the anesthetic. Personally, I think oil ether colonic anesthesia is by far the best method for this particular condition, provided there is not some contraindication, such as painful hemorrhoids or intense fear of any kind of rectal enemas which these patients occasionally have. A small soapsud enema, not over ten ounces, should be given every morning for three or four days before the operation, explaining that this is a part of the treatment and that you want the patient to retain the enema for a short while. A few drops of ether should be added to the enema in order to accustom them to the odor of it. A sterile hypodermic injection should also be given preceding the enema on the day before the operation. We are now using the newer method of oil ether colonic anesthesia, as employed by Gwathmey and Lathrop, which is as follows: About an hour before the operation the following should be injected into the rectum: paraldehyde, one or two drams, dissolved in four or six drams of a mixture of equal parts of ether and olive oil. A half hour after this, a hypodermic of morphine and atropine should be given. About thirty minutes later, inject into the rectum slowly in Sims's position a mixture of two ounces of ether in two ounces of olive oil, or in more robust patients, three ounces of ether in two ounces of olive oil. As soon as possible wet towels should be placed over the patient's mouth and nose to retard elimination of the ether. The patient should be under the anesthetic from ten to twenty minutes after administration. If the anesthesia is too profound, one or two ounces should be drawn off, and if the patient is not under the anesthetic within twenty minutes, one or two ounces should be added. This method has distinct advantages in this condition. It is given

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in bed and the patient is not frightened by the sight of the operating room and no suffocating odor from ether is experienced; the anesthetist is out of the way, thereby giving the surgeon better access to the field of operation; and the postoperative vomiting and nausea are markedly less than by the inhalation method. Thorough irrigation of the bowel should be done with cold soapsuds solution until the return flow is clear, after the operation is completed.

In advanced cases the superior thyroid arteries should be ligated previous to performing the partial thyroidectomy. This can always be done with a local anesthetic. The skin and subcutaneous tissues are infiltrated with novocaine solution along one of the middle creases in the neck. The incision follows the course of this line for about one and one half or two inches, directed from the median line outward; the muscles directly over the lobe are carefully retracted with small Crile retractors, and the superior thyroid artery and vein are exposed and ligated with linen ligature, passed around the artery with a small round needle. If the patient is in a satisfactory condition after this has been done on one side, the incision may be extended and the artery and vein on the opposite side ligated. However, as a usual thing, the patient is sufficiently nervous after the first ligation to warrant delaying the second ligation for a few days should it be necessary. There is no doubt that this preliminary operation will reduce the production and absorption of thyroid poison to such an extent that the patient's general condition may improve sufficiently to make it safe to perform a more serious operation after a few weeks' recuperation.

The technic we are using for the radical operation is as follows: A curved transverse incision following one of the lower creases in the neck is made through the skin and platysma muscles extending well past the internal borders of both sternomastoid muscles. The skin flap along with the platysma muscles is dissected free and reflected upward. The sternohyoid, sternothyroid, and omohyoid muscles are separated from the capsule collectively, and two heavy Ochsner clamps are placed transversely across each group just far enough apart to allow the muscles to be divided with a knife. By doing this you minimize the muscle necrosis. The external jugular vein is usually included in the clamps, and the tip of the clamps extends to the internal border of the sternomastoid muscle. This allows a good exposure of the gland in its surgical capsule. The capsule is incised and bluntly dissected back. The superior thyroid artery and vein are clamped and severed. This mobilizes the upper pole of the gland and facilitates delivery. The inferior thyroid artery and vein and the collateral vessels are doubly clamped and severed between clamps. Then practically all of the lobe is removed, with the exception of a small strip posteriorly, and the upper and lower poles. This is done to protect the recurrent laryngeal nerve and parathyroid glands. There are usually several collateral branches cut within the parenchyma of the gland, but these are easily controlled by hemostats when cut. The isthmus is included and the middle part of the opposite lobe, being careful to avoid

both upper and lower poles and to leave at least one fourth of the entire gland. In removing the isthmus, care should be exercised not to remove the thin layer of fascia covering the trachea. If this is excised, a great deal of tracheal congestion and discomfort is the result. The large vessels are separately ligated and the stump of the gland whipped over with iodized catgut No. 1. Care should be exercised not to place the sutures too deeply, so as to avoid the recurrent laryngeal nerve. The muscles are united on both sides with a lock stitch of iodized catgut and also in the median line. One small piece of rubber tubing is retained in the lower angle for drainage. The platysma muscle and superficial fascia are united with a continuous mattress suture of iodized catgut No. 1 and the skin with a subcuticular stitch of No. 0 tanned catgut. The tube comes out of the skin incision in the median line and should be removed in twenty-four hours.

The head of the bed should be elevated. Cold saline, twelve ounces, is given per rectum every four hours for twenty-four hours to wash out the remainder of the ether mixture, then saline, six ounces, glucose, one ounce, and soda, two drams, per rectum every four hours. Morphine, $1/6$ to $1/4$ grain, with atropine, $1/150$ to $1/120$ grain hypodermically every four hours S. O. S. for the first forty-eight hours and hot water *ad lib.* If the patient's condition is very shaky on leaving the table, Locke's solution, 300 c. c., is given at once by hypodermoclysis, and fifty c. c. an hour until the condition has improved sufficiently to warrant discontinuing it. An ice cap should be placed over the head and neck. If the pulse is intermittent, digalen, ten to fifteen minims, is given every four hours hypodermically. The room should be kept dark and well ventilated. The patient should remain in the hospital after the operation, according to the severity of the case, usually two to four weeks.

In simple goitre, practically the same operative technic is observed. Occasionally only one lobe is affected. When this is found, only the affected part of the gland is removed. The careful preliminary technic is not required. However, following the operation, the treatment is about the same. Occasionally the surgeon encounters a circumscribed tumor in one of the lobes of the thyroid gland which may suggest its removal without excising the lobe in which it is found. Usually the lobe contains a number of these enlarged lobules or cysts, and one may expect that the removal of the large cyst will be followed by the development of others. It is consequently wise to enucleate only in cases in which there is actually a solitary cyst or a solitary adenoma. The operation is usually safe, and the gland should be exposed by the technic as described, only in a modified form.

In considering malignant growths of the thyroid gland, we find that carcinoma of the thyroid is far more common than sarcoma, but as both conditions are hopeless, so far as treatment is concerned, when advanced far enough to be diagnosed, it seems almost futile to give them consideration here. In a number of cases in which thyroidectomy has been performed for the relief of simple goitre

and a postoperative microscopic examination has demonstrated the presence of carcinoma, the patient has remained free from recurrence because the growth had not yet advanced beyond the limits of the gland at the time it was removed. One can readily understand how futile it would be to operate in a case in which a clinical diagnosis of cancer had been made. In a structure with such a complete anastomosis of arteries and veins and as vascular as this structure, nothing other than a recurrence could possibly be expected.

617 WEST GRACE STREET.

CHRONIC DIARRHEA.

By ROY UPHAM, M. D., F. A. C. S.,

New York.

The reference of a comparatively large number of cases of chronic diarrhea in patients to the writer during the past year has led him to evolve the following method of examining and classifying these cases. This method has proved of value because it has systematized the hunt for the etiological factor producing the symptoms so troublesome to the patient. Diarrhea is only a symptom and no more represents a disease in itself than does edema of the feet, but while the solution of edema of the extremities involves a few etiological considerations, diarrhea leads into many directions in the search for the causal factor.

The more the writer studies problems of the digestive system the more he is impressed with the interrelation of functions of its different parts. This leads to the first primary causal factor of diarrhea not in the intestine but in the stomach; it is achylia gastrica, or terminal gastric catarrh. By taking this as a beginning we approach the question practically at the beginning of the digestive system. The prevalence of diarrheal conditions dependent upon a loss of gastric secretion is surprising. Achylia gastrica is due to loss of gastric secretion, whether we class it as a terminal gastric catarrh, where the secreting structures have been entirely replaced by connective tissue so that no true gastric secretion is formed, or whether we class it as a neurotic manifestation with a cessation of gastric secretory function from neurotic inhibition. Diarrhea is not a characteristic symptom in achylia, but when in the presence of loose bowels, no hydrochloric acid is found in a study of the gastric secretions, the case will be found to be one of the most tractable to treatment. The therapeutics is a diet reduced in protein content and composed mainly of farinaceous foods (1). Hydrochloric acid therapy is given in a mixture as follows: Dilute acid hydrochloric, one ounce, and enough glycerinum pepticum to make four ounces, of which one teaspoonful is taken well diluted through a glass tube to keep it away from the teeth, beginning a quarter of an hour after meals and taking fifteen minutes to consume. To those who are unable to avail themselves of gastric analysis the writer would suggest this hydrochloric acid therapy as a diagnostic means, for in a diarrheal case with an achylia diet, the amelioration of symptoms

by the production of acid by this means, would point conclusively to a condition of achylia in the stomach.

The second class of diarrhea, due distinctly to a stomach condition, results from an atonic and dilated organ and is characterized by a morning diarrhea, the movements occurring on arising, or within a few hours after the patient is up. The explanation of these cases is that an atony of the stomach results in an improper mass of food being passed on from the stomach to the intestines; that is, food which has been improperly digested and, therefore, is in a measure irritating to the intestinal mucosa. Another fact pointing to the relation of stomach disease and the intestinal condition is that these cases are practically always accompanied by atony and weakness of the intestinal musculature. The explanation of the early morning diarrhea is that there is a slowing down of the motor functions of the digestive system when the patient assumes a recumbent position in sleep, and there is a lack of general muscular exercise with the result that bacterial fermentation occurs during the night, producing toxic products which nature eliminates in the form of a morning diarrhea. While the patient is up and about during the day, on the other hand the muscular activity of the body enhances the motor activities of the digestive system. The early stages of this condition are shown by the excessive quantities of gas which are passed on the patient's first moving about in the morning, which are due to the same fermentation. This is the preliminary stage and if it is not remedied it advances to the stage of morning diarrhea.

The diagnosis of this class of cases is made by the use of a stomach tube, which shows an abnormal retention in the stomach. This is further emphasized by inflation with the stomach tube or inflation by means of tartaric acid and soda, which outlines the borders of the organ in an abnormal position and makes the diagnosis of gastric atony. Treatment by means of abdominal faradism, shot bag exercise, and general abdominal exercise, the details of which can be found in a paper on splanchnoptosis by the author (2), will remedy this condition. The diet in these cases is dry, of small amounts, and with restricted fluids. Women should wear a supporting corset and the intra-abdominal pressure is further increased by the author by the insertion of a half moon shaped rubber bag which extends from the navel downward with its convexity over the symphysis pubis. When inflated with air this raises the intra-abdominal pressure and elevates the organs to their proper position, thereby eradicating abnormal angulations better than any other device which has thus far been presented to the profession.

Passing from these two stomach classifications we approach the class of disease due to colitis. The dissolved albumin test has demonstrated that colitis is probably always complicated by disease of the small intestine, but there are no particular methods of accurate diagnosis which I can present to limit the condition to the small intestine. When disease is present in that organ there is practically always colitis which overshadows the condition in

the small intestine. Colitis is divided into the catarrhal type and the ulcerative type. The catarrhal type is diagnosed by the presence of mucus in the stool, which is always visible, but if it does not show under ordinary conditions it will be recognized by giving a second enema after the colon is emptied with a preceding cleansing enema, the water which comes away in the second enema in cases of colitis being loaded more or less with transparent mucus. Cases of colitis of a catarrhal nature are differentiated from those of an ulcerative nature by means of testing the stool for the presence of blood, hemorrhoidal conditions having been excluded by means of a protoscopic examination. To determine the presence of blood in the stool the patient is put for five days upon a diet which excludes meats and meat soups. Then the stools are examined. The author's method is to have the patient supplied with a series of six two dram medicine vials, into each of which a portion of stool is put, the size of a marble, and water added to fill half the bottle. These are brought in by the patient and are readily examined by transferring the contents of each bottle into a separate test tube. To this is added one dram of glacial acetic acid, 0.5 dram of ether, fifteen drops of a two per cent. benzidin solution, and fifteen drops of commercial peroxide. With blood present a blue to green discoloration takes place in from five to fifteen seconds. When this occurs we know that the condition has emerged from the catarrhal stage into the true ulcerative stage. We are now able to approach the etiology of ulcerative colitis, which is divided into the following types: the bacillary, amebic with also the carcinomatous type; syphilitic; tuberculous; cancerous; and amyloid.

The true bacillary type is diagnosed by the exclusion of the other ulcerative types, the slides showing a preponderance of the streptococci and staphylococci with the colon bacillus. The amebic type, while rare now in this climate, is becoming more and more frequent, for this parasite is being introduced as the American people become more cosmopolitan. Great numbers of persons who have gone to the Canal Zone, the Philippines, and various other tropical regions have come back as carriers of the ameba, and in this way those at home have become infected with the microorganism. The amebic parasite is readily recognized if proper precautions are taken in the preservation of the stool. It is impossible to discover the ameba in a stool which has become cold, and wherever possible the stool should be examined when it is fresh, after the patient has taken a dose of epsom salts. The second stool is examined; the first stool, which is the contents of the colon, having been passed and thrown away. If it is not convenient, as is frequently the case, to secure the second stool in the office of the physician, the patient is instructed to use a thermos bottle which has been heated by being filled with warm water, in some instances an ounce or two of water at 68° F. being left in the bottom of the bottle, and then the stool is passed into the bottle and brought to the physician. By that method the ameba are readily recognized. The investigations of Smithies (3) at the August-

tanna Hospital have shown the frequency of diarrhea due to the cercomonad and trichomonas. The therapeutics, of course, of the amebic type is ipecac. The cercomonad and trichomonas are not affected by ipecac, and are best eliminated by large doses of calomel.

The syphilitic type is, of course, diagnosed by the Wassermann reaction, and here let me call attention to the fact that the services of the Board of Health of the City of New York are always available and the board is most courteous in the handling of patients. This work is being done for those to whom it would be a hardship to pay the ordinary fee for this examination. The syphilitic cases, needless to say, require antisiphilitic medication. Tuberculous ulcerative colitis is diagnosed by usually being secondary to tuberculous disease elsewhere, and as a routine in our office in cases where there is a suspicion of tuberculosis, we have been using the serial dilution of old tuberculin as a diagnostic aid. The patient is instructed to record his temperature morning and night for seven days, at the end of which time ten drops of tuberculin, serial dilution No. 3, are injected. If there is a rise in temperature from this injection, a positive reaction is diagnosed. If there is no reaction at the end of five days, twenty-five drops are given. If there is no rise in temperature of one degree following this last injection, tuberculous infection can be excluded. We have used this in many cases during the past year and have had no evil results from its use.

The carcinomatous cases practically all present three symptoms which make the diagnosis positive: 1, rapid onset with emaciation and anemia out of proportion to the length of time the patient has been ill; 2, the presence of a mass in probably eighty per cent. of the cases; and, 3, the presence of visible peristaltic waves. The invasion of the intestinal mucosa by malignant degeneration practically always produces an early occlusion of the lumen. As occurs everywhere in the human anatomy, with increased resistance Nature attempts a compensatory hypertrophy; this compensatory hypertrophy is exemplified in the intestinal canal by means of visible peristaltic waves, which if not discernible, can sometimes be elicited by striking the abdomen or pouring on a cold substance, such as ether or cold water. The amyloid cases are rare, as is amyloid disease in any place in the body, and are always preceded by prolonged suppuration, which is usually in the bone and of a tuberculous type. Such a history should direct our attention to a myeloid change in any organ in which symptoms arise.

The treatment of all these types, other than the bacillary type, is, of course, well known. Malignancy requires operation, some tuberculous cases require operation, and others systemic treatment; the amyloid cases are alleviated only by eradicating the primary focus of tuberculous suppuration. The bacillary type is attacked by proper diet, colonic lavage, autogenous vaccines, and the instillation in the rectum at night, first, of oil enemas, and if these are not effective, injections of six ounces of thick gelatin solution, fluid enough to

pass through a rectal tube, and, last, large injections of bismuth subcarbonate, one or two ounces being given every third night to be retained until morning (4). The most valuable intestinal antiseptic is magnesium salicylate or bismuth salicylate in eight grain doses by mouth.

We next come to a consideration of the third class of cases, those due to colonic stasis. They are best diagnosed by the abnormal retention of the bismuth meal on x ray examination, but the general practitioner has a ready method of determining the sluggish passage of intestinal contents in the administration of capsules of eight grains of carmin dye. This dye should make its appearance in twenty-four hours and should be entirely eliminated in the stool on the second morning, while its retention to the third and fourth day demonstrates colonic stasis and necessitates an x ray examination to determine its exact location and method of treatment. There is one type of intestinal stasis which represents many cases of diarrhea which are overlooked by the physician, this is the type where there is retention of hardened scybalous masses in the rectum. In every case of diarrhea the rectum should immediately be subjected to a proctoscopic and digital examination, for a diagnosis has frequently been made upon the discovery of a hard mass of fecal matter which has become impacted in the rectum and which because of its irritation has set up a discharge partaking of the nature of diarrhea. This condition is particularly prone to arise in operative cases where drainage is instituted with removal of the gallbladder, where the major portion of the biliary content is extruded through a fistula in the abdominal wall. I have seen a number of cases in my own practice, as well as some that were handled by other operators, where there was a very pronounced tendency for hardened fecal masses to collect in the rectum where the biliary secretion was directed other than into the intestinal lumen. It is, therefore, very essential that a close watch be kept over the condition of affairs in the rectum in postoperative gallbladder work.

Digital examination of the rectum also impresses upon one the frequency with which malignancy is associated with a bloody diarrhea. Let me advise every one to place in his armamentarium a tubular proctoscope and a good rubber glove and in any case with symptoms in the colon or rectum to employ them diligently. There is nothing that injures a man's professional reputation so much as carrying a case over a prolonged period with a diagnosis of simple hemorrhoids and having a more careful brother practitioner or specialist, by means of a rectal examination, which has been previously omitted, find a malignant process so far advanced that cure, even by operation, is impossible.

The next group of cases, diarrhea due to emotions, is in a general way familiar to many, and as this class of cases occurs during periods of stress, the etiological factor is at once presented by the individual who has exaggerated knee jerks, twitching of the upper eyelids, and various other stigmata of nervous instability. These cases are more apt to be periodic in onset and of shorter

duration and are rarely overlooked from the diagnostic standpoint.

The fifth class includes the diarrheas which are due to diseases of the ductless glands. The most prominent of these is the diarrhea which is associated with pancreatic disease and is characterized by the appearance of diarrhea with undigested fat in the stools showing as glistening particles, as if the patient had partaken of an excess of paraffin oil. These cases are usually due to malignant disease of the pancreas and the diagnosis is verified by using the pancreatic inefficiency test (5), which in reality is the testing of the digestive power of the stool as far as trypsin upon casein is concerned. Normally the casein should be digested within twelve hours. Where this digestion has failed to take place within this time and has been extended to twenty-four or thirty-six hours, you can positively state that you are dealing with a pancreatic lesion, and it is often verified by glycosuria.

The thyroid cases, due to their neurotic instability, as well as the toxemia due to excessive thyroid secretion, have also a diarrheal phase and careful search for thyroid enlargement should be made in every case. In addition to this, in a paper on chronic diarrhea Dr. Dudley D. Roberts, of Brooklyn, drew the attention of the profession to some diarrheal cases which had the concomitant bronzed appearance of the skin, and while they did not have the other typical symptoms of Addison's disease, this can only be explained on the ground of disease of the ductless glands, the adrenals. Hemolytic jaundice, as we now call it, or the pernicious anemia of the days gone by, is now passing into the realm of infectious diseases and the source of infection is in the teeth, tonsils, or skin. This, likewise, is accompanied by a diarrhea which we can class as a diarrhea of the ductless glands. Leucemia, which also can be probably explained etiologically as an infection occurring in some place whereby the lymphocytes are thrown into the bloodstream in great numbers, also has its diarrhea, but in all these three conditions—Addison's disease, hemolytic jaundice and leucemia, the primary disease should outweigh the symptom of diarrhea.

The sixth class of cases are the intoxications, the first three of which are due to what is called botulism, or poisoning from hams or sausages; microbic infection, which is not uncommon at the present time in our day of delicatessen stores and quick lunches; arsenic and antimony poisoning, which are industrial conditions; and mushroom poisoning should be thought of and readily diagnosed by interrogation of the patient. Classified with the intoxications is the diarrhea of chronic kidney disease, or uremia, and a proper urinary examination in which the amount of total chlorides is ascertained and the ability of the kidneys is estimated upon the excretion of chlorides, solids, and urea, rather than upon microscopic analysis, will verify the diagnosis. In this same class of cases come the diarrheas accompanying cirrhosis of the liver and syphilis of the liver, which, when thought of, are diagnosed by physical examination and the finding of a narrowed hepatic structure in one case and

enlargement in the other, accompanied by a positive Wassermann reaction.

The seventh class includes the systemic diseases which are accompanied by diarrhea: 1, enteric; 2, tuberculosis; 3, locomotor ataxia; 4, septic conditions, particularly pyemia and septicemia; and, 5, a disease which is rare with us, cholera. The diagnosis of these conditions will not be entered into.

The mere mention of them and a routine examination according to this etiological classification will check up and make the diagnosis certain.

Last, intussusception with its bloody mucus diarrhea and its palpable tumor, occurring almost always in children, should not be overlooked in a condition of frequent movements in a young person. The rectal cases are evident on proctoscopic examination.

If this classification of diarrhea on the etiological basis is preserved with the thoughts which the writer has outlined, a systematic routine method of examination will be available when the next case of this character presents in the consulting room.

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UTERINE SUBINVOLUTION.

Its Treatment by Massage and Light.

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The nonpregnant uterus is a small, pear shaped, flattened body, about 7.5 centimetres in length, five centimetres in breadth at its upper end, and 2.5 centimetres in thickness. It weighs from thirty to forty-five grams. During pregnancy it enlarges tremendously in all directions and weighs about two pounds directly after confinement. Half of the increase is lost during the first eight days after the birth of the child, the rest, down to about two ounces, disappears in the next five to seven weeks. These are the well known anatomical and physiological facts which form the basis of the following considerations.

The normal process of the reduction of the uterus is called involution. Any disturbance of it leads to a temporary or permanent enlargement of the uterus, named subinvolution. This enlargement may be small or great and can vary from a slight increase of the size of the uterus to the bulk of a baby's head. This explanation of the characteristics and origin of subinvolution seems simple enough. It is, therefore, surprising how frequently the enlargement due to subinvolution is confounded with that due to inflammation, and how difficult it seems to separate subinvolution from metritis. The confusion existing in this respect even in the minds of prominent teachers can no better be characterized than by quoting from the textbook of Montgomery (1), who asserts that "the differential diagnosis be-

tween subinvolution and chronic metritis is impossible and the treatment of the two conditions does not differ." Neither statement is warranted. Though both conditions may exist together, the differential diagnosis can always readily be made by simply ascertaining the source and beginning of the trouble. Nor is the treatment the same in both instances. It differs essentially whether inflammation is present or not, especially in reference to the means that are here recommended. It is one of the fundamental rules of pelvic massage not to apply this treatment in those cases in which acute or sub-acute inflammation exists, and to apply it only with caution and after due preparation with bacterial vaccines in the case of chronic infection.

Therefore, from a scientific as well as from a practical standpoint, there is urgent need that the fallacy of the identity of subinvolution and metritis be discarded, and that at the same time the importance of subinvolution as a disease and as a source of other diseases be recognized and appreciated. This is not the case at present. If we are to judge from the brevity and incompleteness with which the subject of uterine subinvolution is dismissed in our textbooks and from the paucity, the almost entire absence, of articles on this subject in the overflowing medical literature, the assumption seems justified that this affliction is of minor consequence and not worthy of serious consideration. Nothing, however, could be further from the truth. The paucity of literature on uterine subinvolution does not reflect the actual situation. Indeed, it is in direct antithesis to the dark and sinister aspect which this affliction assumes if its direct and indirect consequences are considered.

The justice of this assertion is readily appreciated if we view subinvolution in its causative relation to other diseases. We find that the heavy subinvolved uterus predisposes to displacements: to retroversion, to retroflexion, and, if the suspensory and supporting structures of the uterus are relaxed, to prolapsus. The engorgement of the blood and lymph vessels, always present in these cases, frequently involves the Fallopian tubes and ovaries and disturbs their function. The increased secretions, due to the circulatory stagnation, offer a fertile soil for the development of microbic life, and in this way may lead to acute and chronic inflammation and to a long list of complications that not only make the life of many women miserable but bring many others to the operating table. In view of these facts, more attention should be paid to subinvolution by both physicians and midwives. When early recognized and properly treated, the chances for complete recovery are excellent. As the case grows older, these chances diminish and finally vanish in the same degree as the muscular fibres of the uterine walls perish and are replaced by fibrous tissue.

There should be no difficulty in recognizing subinvolution. It cannot escape attention wherever the routine examination at the end of the puerperium is made. If this is neglected, the symptoms of the patient should not fail to give the warning. They are so characteristic that, if they develop with a woman who has just passed through a confinement, miscarriage or abortion, a subinvolution should be

suspected and searched for. These symptoms are: increased or irregular bleeding upon the return of menstruation, backache, heavy feeling in the abdomen, and discharge. The finding of an enlarged, soft and boggy uterus secures the diagnosis. Complications may be present or not. The prophylactic treatment lies solely with the obstetrician. Careful attention to the mother during pregnancy and labor will do much, careful attention to her after childbirth will do more to prevent subinvolution. This is especially true in all cases in which a predisposing element is present and the muscular fibres of the uterus are weakened by previously existing displacement and inflammation, by infection during childbirth, incomplete emptying of the uterus, especially after abortion, rapid succession of births, undue extension of the uterine walls in the case of twins or hydramnios, and by the baneful influence of an asthenic constitution. This latter condition is of special interest in this direction and responsible for a large percentage of those cases of subinvolution and displacement that seem to come without apparent cause. Nursing is of great assistance, as the irritation of the nipple forces the uterus to contract. Consequently, nursing mothers far more rarely suffer from subinvolution than nonnursing ones.

Very good results are reported by Dr. Alfred C. Beck (2) from "walking on all fours." He advises his patients to walk on hands and feet, knees stretched, first but a few feet, then daily increasing the distance. Thus the number of cases of subinvolution and retroflexion in the postpartum clinic of the Long Island College Hospital are said to have been materially reduced. As I attend to no obstetrical work, I have no personal experience in this matter. The method, however, appeals to the mind as sound and practical and deserves a trial for its simplicity and ease of application.

The treatment of subinvolution, when developed, is not so promising. Indeed, it is very unpromising and unsatisfactory with the ordinary means usually employed. The following measures are recommended: remedies, such as ergot, hydrastis, strychnine, quinine; hot douches; blood letting at the cervix; tampons with glycerin and ichthyol; attention to complications; and general hygienic measures. Attention to complications and general hygienic measures are, of course, a necessary prerequisite of success and should not be neglected. But the remedies and local measures above referred to frequently fall short of expectations, as experience teaches; a short reflection will show the reason.

In all cases of subinvolution there is stasis, a stagnation of blood and lymph. The retardation of venous and the difficulty in the afflux of arterial blood make the exchange of fluid in the tissue spaces slow and incomplete. In consequence, there is lack of nourishment and oxygen and an undue accumulation of waste products, both of which are deleterious to the function of the muscle fibres. Under these conditions, remedies coming with the bloodstream will find it difficult to reach their destination, and if they do reach it, will find the muscular fibres in no condition to respond to their stimulation. Blood letting at the cervix may, and frequently

does, restore the balance of circulation within the neck of the womb, but has little influence upon the circulation of its body. If it works at all, it works but slowly and by dint of reiteration. The same is true of depletion with glycerin tampons and other remedies, while hot douches may increase the amount of arterial blood but also tend to relax rather than to contract the muscular fibres.

We see, therefore, that none of the remedies ordinarily used meet the requirements of these cases. Fortunately, however, we possess in massage the remedy that does meet these requirements. It frees the circulation, empties the lymph spaces, and induces contractions of the muscular walls. No school teaches it, no textbook mentions it, and only a few articles on pelvic massage draw attention to its great efficiency (3). Nevertheless, it helps and helps quickly. But a few minutes of proper massage are required and the large and flabby uterus grows smaller, harder, and less painful. The stagnation is relieved by mechanically pressing the fluid from the tissue spaces into the lymphatics and by emptying the engorged venous system into the larger veins. Arterial blood is now free to enter, so that the muscular fibres of the uterine walls receive the nourishment and oxygen they need for their normal function. Last, but not least, the stimulation exerted upon the muscular walls is promptly followed by their contraction. It remains doubtful whether this stimulation affects the muscular fibres directly, or does so indirectly by way of the ganglia which are located between the muscular layers.

The application of massage is not difficult in these instances. No practitioner with ordinary gynecological knowledge and skill should shrink from undertaking it. Massage of the Fallopian tubes and ovaries and the separation of adhesions within the pelvic cavity (4) is, indeed, difficult and requires special knowledge, experience and skill (5), but the large and heavy subinvolved uterus can easily be found and easily managed. The method of application does not differ from that usually employed in pelvic massage: the index and middle fingers of the left hand lie within the vagina lifting and steadying the uterus, while the fingers of the right hand apply the massage. Beginning with soft, circular movements, light pressure is exerted only in the direction in which the lymph and bloodvessels empty. To begin with, the treatments are short, five minutes or less. However, as improvement progresses, or in older cases, time and pressure may gradually be increased as the occasion demands or results warrant. If complications exist, they must, of course, be treated simultaneously. I have found an excellent supplement to massage, in the treatment of subinvolution as well as other gynecological affections, to be the application of incandescent light. Too little attention is paid by the medical profession to this simple but extremely valuable and efficient remedy. It would lead us too far from our present subject to go deeper into the discussion of those physiological qualities of light that bring about its good results in the treatment of human ailments. They have been laid down in literature on various lines (6). Only such as interest us here particularly may be mentioned, namely, that light is known

to promote the circulation and to increase the amount of arterial blood. In addition I found that light has also a decided influence upon the contraction of the muscular fibres of the abdominal and pelvic organs.

This latter quality is of preeminent importance in our cases and deserves special emphasis. My attention was drawn to this peculiar action of light by my repeated experience that during the application of light in gynecological cases, enlarged Fallopian tubes, undetectable at first by simple abdominal palpation, became distinctly palpable. My attention being drawn to this fact, I have followed it up and made use of it in many of my cases. On account of the importance of the subject from our standpoint and that of the abdominal surgeon it may be permitted to cite two characteristic cases, though they concern paralytic conditions of the bowel and not the uterus. The first is my own case.

CASE I. About nine years ago my appendix was removed during an acute attack of appendicitis. On the seventh day I left the bed; on the ninth day I began attending to



Showing the position of the bowels during massage.

my own patients. But, in spite of the initial success, I soon began to have similar attacks as I had before the operation, only lighter in character and at longer intervals. These attacks were due to paralysis of the ascending colon and stagnation of its content. Remedies, electric treatments, and also massage, gave but temporary relief. One day swimming at one of Chicago's bathing beaches, I almost drowned, as the pain in my right side became suddenly so acute that I could move my legs only with difficulty. I managed, however, to reach solid ground, dressed, and limped home. This happened about one and one half year after the operation. From that time on I applied the light. First I used a thirty-two candle power bulb for two or three weeks. There was some improvement, but not sufficient to satisfy me. Then I procured a 250 candle power Mazda light and used it at first daily for fifteen or twenty minutes and later every second day. After five to six weeks of treatment the paralysis was gone and conditions were normal. This is over seven years ago. I never had another attack.

The other case is of very recent date.

CASE II.—Mrs. S., twenty-seven years of age, miscarried on April 3, 1917. Inflammation developed. Two

weeks later she came into my service. I found the lower part of her abdomen extremely tender. There was a moderate enlargement of the right Fallopian tube and considerable swelling of the right parametrium. Gonococci were present in the discharge. After two weeks of appropriate treatment the condition of the patient was decidedly better. The swelling of the right parametrium and the enlargement of the Fallopian tube had disappeared. Instead, a fecal tumor began to develop, which in the next three days grew until it reached from the left brim of the pelvis to the arch of the ribs. There was no occlusion of the gut, as the bowels moved a little daily and gases passed freely. The condition began to look serious and drastic measures were adopted to empty the bowels. High enemas, castor oil, two ounces at a time, and other remedies following in quick succession effected the disappearance of the tumor in its lower aspects, but it remained unchanged below the ribs. Two days were spent in these fruitless efforts to secure a free passage. Then a 250 candle power light was procured and applied at a comfortable distance for one hour. One hour after this treatment there was a copious movement and the tumor disappeared.

The application of light is very simple. Special instruments are not necessary. The ordinary commercial incandescent light is sufficient for the purpose, provided it is equipped with a good reflector. To assure penetration, large lights from 150 to 250 candle power are preferable, but also smaller lights have given good service. With the patient in a recumbent position, these lights are hung over the lower abdominal region and arranged so far from the skin that the heat is comfortably borne. The length of application may be from ten minutes to one half hour or more, once or twice a day. The feeling and the comfort of the patient are the deciding factors. It is well to begin with a short time and gradually increase the length of the treatment as it seems advisable.

In the beginning and with very sensitive patients the contractions of the uterus may be slightly painful. In these instances, one of the smaller lights may first be employed or a sky blue bulb be used. The blue light is soothing and is borne better in painful afflictions. As the case progresses, the blue light may be changed into white light and finally into red light. Red light is most stimulating and induces absorption better than any other. Instead of using one bulb it may sometimes prove advantageous to use a cluster of lights. In these clusters the color scheme can be carried out very nicely and the light gradually be changed from a soothing to a stimulating effect to suit every emergency that may arise.

By partly working in the same direction and partly supplementing each other, the combination of massage and light has proved highly satisfactory in the treatment of subinvolution. It yields very good results in the shortest possible time and is effective in cases in which the ordinary means are of no avail.

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X RAY FINDINGS IN THE GASTROINTESTINAL TRACT.

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In the study of the gastrointestinal tract, the internist and röntgenologist are confronted with the most varied conditions, which while normal or

at different times, I have found the contour and other shadow outlines of the alimentary tract are as characteristic of a particular individual as his finger prints. I first briefly describe the normal appearance of the alimentary tract as compared with some of the abnormal conditions to be discussed later.

The fundus of the stomach is invariably found in its normal position because of its firm attachment to the diaphragm, esophagus, and a part of the hepatogastric ligament which is strong and dense. The thinner portion of this ligament is attached to the lesser curvature, hence, the possibility of ptosis of the lower portion of the stomach. A small part of the denser ligament helps to form the hepatoduodenal ligament which maintains the first part of the duodenum on a higher level than the lesser curvature, even in the worst degree of ptosis. The great curvature of the stomach is infrequently found two fingers' breadths above the umbilicus as described by anatomists. It is more often found below the umbilicus and to the left of the median line, especially when the radiograph is taken in the erect posture. Fig. 1 shows a full stomach located to the extreme left of the median line and the greater curvature extending low down in the pelvis. In contrast to this, Fig. 2 shows a six hour stomach



FIG. 1. A, spastic incisura; B, dilated antrum.

symptomless in some individuals, may be abnormal or cause serious disturbances in others. In the review of radiographs taken of the same individuals

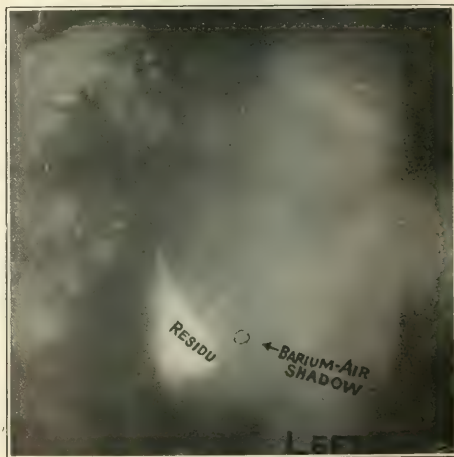


FIG. 3. Six hour plate showing air-barium shadow.

which is drawn to the extreme right on account of extensive adhesions in the region of the gallbladder and pylorus. These plates were taken in the recumbent position.

Abnormalities of the corpus gastrica may be seen in the form of extragastric pouching, due to perforating or penetrating ulcers, incisura, and hour-glass contractions, which may be organic or spastic in character. A condition especially indicative of a penetrating ulcer is the presence of an air barium shadow subsequent to complete emptying of the stomach of the barium meal. Figs. 1 and 3 depict a few of the conditions mentioned. These patients presented suggestive clinical symptoms of chronic



FIG. 2.—Showing extensive adhesions. Six hour plate.

ulcers, and one has been operated on for this condition. The antrum pyloricum is especially interesting from the röntgenological point of view. Normally the antrum appears as a slight dilatation, while in any case where the pylorus becomes ob-

structed, the antrum appears dilated. Figs. 1 and 4 exhibit a markedly dilated antrum due to partial pyloric obstruction. The small intestines present a varied radiographic picture, on account of their loose mesenteric attachment. They are often low down in the pelvic cavity, as they appear on Figs. 3 and 5.

Second to the duodenum in importance in the examination of the bowel is the colon. The cecum, transverse colon, and the descending colon are often found as described in textbooks of anatomy. In abnormal conditions the cecum may be found pto- sated, sacculated, or constricted by adhesions. Lane's kink and Jackson's membrane can often be shown on a good radiograph. The appendix is often hidden from view on account of its frequent retrocecal location, or it may fail to fill with barium. It deserves a study, however, as I have in many cases been able to demonstrate it. The presence of concretions, angulations, or kinks can be discerned with precision.

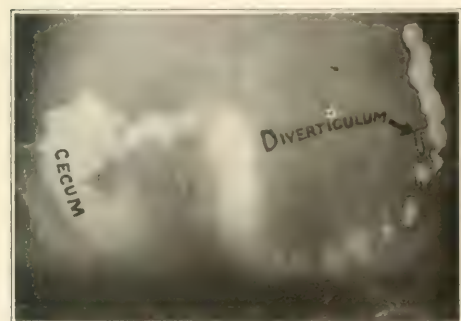


FIG. 5. Diverticulum of cecum, seen in the descending colon.

not as rare as it was thought to be (2). In Fig. 6 a diverticulum of the descending colon is visible which gave rise to no symptoms. Inflammation of this appendix, if located on the left side, produces a condition similar to that on the right, but considerably more perplexing to diagnose clinically.

In describing and illustrating these few abnormal conditions, I am simply emphasizing the advantage derived in using this important physical means in searching for the multitude of obscure conditions to which the gastrointestinal tract is subject. Needless to state, conclusions are at times not infallible, but it is now a recognized fact that an x ray examination is essential in definitely substantiating a clinical diagnosis.

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232 EAST FIFTH STREET.

Rothmann's Narcosis in War Hysteria.—

H. Joseph and E. Mann (Zentralblatt für Chir., 1917, 43, 10) have published a report on the use of the method in thirty-six out of thirty-seven cases, including thirty-two of hysterical tremor. A subcutaneous injection of distilled water was administered as a suggestion while under narcosis.



FIG. 1. Six hour plate.

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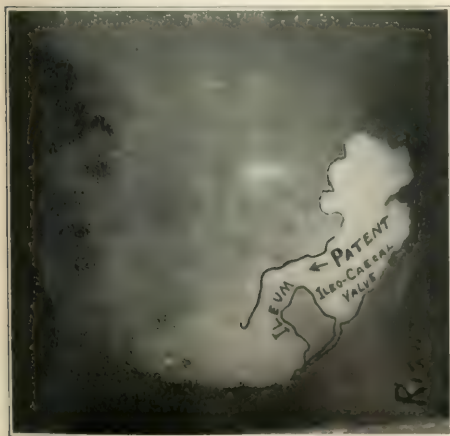


FIG. 3. Twenty-four hour plate.

THE PLACE OF THE PHARMACIST IN THE ARMY.*

By J. MADISON TAYLOR, M. D.,
Philadelphia,

Professor of Applied Therapeutics, Medical Department, Temple University, Philadelphia.

In the steady advancement in social and national welfare, the science of pharmacy, and in particular the present qualifications of pharmacists, may not yet be appreciated. No longer are they mere vendors or purveyors of drugs, but constitute a learned profession demanding of themselves a scientific training and equipment competent to meet the demands of modern medical, surgical and sanitary science. Among their ranks are numbered a large proportion highly educated in many of the same fundamental lines on which the profession of medicine is advancing. They now constitute a powerful and effective national organization in research work, chemists, biologists, physiologists, toxicologists, serologists, bacteriologists, devoted to the elucidation of the more obscure but essential problems concerned in saving human life.

They cover, and cover well, a domain to which the medical profession cannot devote their time since pharmacy must perfect the instrumentalities and agencies which surgeons must find ready to hand and in perfect condition to apply instantly in ever widening clinical problems. During stress of overwhelming work these skilled technicians, thoroughly trained in chemical and manipulative niceties will prove invaluable.

Of course, the number of those exceptionally educated is still limited, but they are increasing every year. Requirements in the schools of pharmacy are being rapidly raised, aiming to produce a group of men just as highly educated in their domain as the medical students in theirs. In contrast with what these requirements were twenty or thirty years ago modern pharmacy graduates are incomparably superior. In fact, primary requirements today are equivalent to those for medicine in many states. Many of the subjects pharmacists are required to study are the same as those of the medical students. They overlap, constituting a close association, an interdependency with scientific medicine, and they become so necessary to the profession of medicine that they supplement in essential particulars all the advances in medicine.

Let it be clearly understood that these pharmacists while originally, and still to a large extent, are merchants and manufacturers of drugs and remedies, they number groups of research workers so highly trained as to be fully qualified to bear similar, indeed equal, responsibility with physicians. It is of course desirable that in making selection of pharmacists for military service, examinations shall be as exacting as to meet the requirements of examining boards of the army and navy. Hence, the protection of the service, hence the welfare and lives of the enlisted men and officers, will be amply secured. I am credibly informed that those pharmacists who

now qualify for and seek military service will often surrender positions which remunerate them many times over what they would receive in service pay. Hence, their aim is patriotic. They expect rank for the purpose of securing attention and exercising authority within their domain.

Among the particular services a specially educated pharmacist could render are these:

Supplementing and contributing to the correlating data for the surgeon, in short, in the "paper work."

Performing a large part of the clinical laboratory work, uranalyses, blood examinations (morphological or pathological), in cytology, serology, vaccine preparations, bacteriology in the preparation of microscopic slides; in the examination of gastric contents, feces, exudates, transudates, etc.

Applying tests such as Wassermann, Noguchi, Widal, etc.; all chemical procedures; he could keep the material for these tests up to date.

Supplementing in x ray work; keeping the mechanisms of röntgenology in order, printing plates, etc.

Many chemical problems arise in connection with poison cases. He could prepare all special materials for such procedures as hypodermoclysis, blood transfusion, Carrel-Dakin solution, etc. Examine water, water supplies, all articles of food and drink, milk, meats, etc., which must be critically estimated.

Those who desire to become candidates for military service are already seeking instruction and experience in meeting minor surgical and medical emergencies, in the dressing of wounds, in the adjustment of dressings, making special solutions. One surgeon and two pharmacists could probably do as much good work as two or three surgeons.

The claim is made by the opponents of the pharmaceutical corps that the medicines or drugs used in the army are very simple and few, and served mostly in tablet form, readily handed out by any bright, alert, enlisted man selected and trained for the purpose. How about the poisons? How many blunders are made in such an elementary form of dispensing? Full knowledge of the properties of death dealing chemicals is an absolute essential for the man who handles them. I have been credibly informed that the official army drug table authorized by the Secretary of War comprises nearly 600 drugs and drug products of all kinds, *including poisons of the deadliest character*. Also that this drug table or list is admitted to be only the "minimum number of articles essential to the nation's medical activities." Obviously the preparation, compounding, and especially the dispensing of such dangerous products demand trained pharmacists. Note the gravity of this problem, the hideous peril run by our home defenders by such haphazard distribution. How many fatal blunders have occurred? How can the surgeon keep control of the leaks in the chain of procedures from bottle to patient? How many curious, inexplicable causes of deaths! Should an error be suspected by the enlisted man who dispenses poisons there is every temptation to keep quiet and thus escape blame. Clearly our home defenders deserve fully as much special skill in the distribution of drugs as our home makers.

1504 PINE STREET.

*Argument presented to the Committee on Military Affairs of the House of Representatives at hearing of the Edmonds Bill, H. R. 5531, March 19, 1918.

Our Readers' Monthly Prize Discussions

Twenty-five Dollars Is Awarded for the Most Satisfactory Paper

All persons, whether subscribers or not, are invited to compete for the prize of \$25 offered for the reply deemed best by the editors to the following questions:

CXCII.—How do you treat whooping cough? (Closed)

CXCIII (and last).—What kind of feet must a soldier have? (Answers due not later than April 15th)

These competitions, which have now been running some fifteen years, will henceforth be discontinued, as a very wide field of medicine has now been covered and the exigencies of war necessitate economy in space.—EDITOR.

The award will be based solely on the value of the information contained in the answer. No importance will be attached to literary style. Answers should preferably contain not more than six hundred words, and should be written on one side of the paper only. All papers submitted become the property of the JOURNAL, and should bear the full name and address of the author for publication. The prize will not be awarded to the same person more than once within a year.

The prize of \$25 for the best answer to Question CXCII has been awarded to E. P. Hershey, C.E., M.D., of Denver, Colo., whose paper appears below.

PRIZE QUESTION NO. CXCII. THE TREATMENT OF LOBAR PNEUMONIA.

By E. P. HERSHEY, C. E., M. D.,
Denver, Colo.

Diseases, such as lobar pneumonia, should not be treated by any set rules, common sense, based upon experience, being the safest guide. Given an infectious disease, a comprehension of the prevailing conditions is imperative. Is the malady due to pneumococci, streptococci, staphylococci, or to the bacillus catarrhalis, to any combination of these, or to all of them? Which prevails? Whether or not you have to use it, have an autogenous vaccine made at once. If from the predominant symptoms of the case, the patient seems to be unable to counteract the toxins produced, give the vaccine freely, rather than too cautiously, ten to fifteen c. c. for the first injection. Should you be so located that the autogenous vaccine can not be made, use the stock (mixed) one, supplied by the various reliable firms who furnish it to your local druggist. If further isolated so that you cannot procure even this, do not think you are without resource, for many cases of pneumonia, not those that get well of themselves, but severe cases, have recovered through prompt action on the part of the physician, long before we ever thought of vaccines.

The more staggering the effects of the infection, the more you should bear in mind that your pneumonia cases that have died did so either from heart failure or septicemia, seldom if ever from insufficient aeration.

Get after the heart at once. Consolidation of the lung tissue limits the circulation through the part or parts affected; backward pressure upon the right side of the heart is sure, sooner or later, to cause dilatation, be ready to meet this by giving fat free digitalis, twenty to thirty drops every three hours from the beginning, or preferably, the infusion, if freshly made, in tablespoonful doses. Devote your entire attention to the heart's action. If for any reason you think the digitalis is not doing its work promptly, whip up the heart with strychnine, preferably hypodermically, giving one thirtieth of a grain every two or three hours. When

the tension is high and the pulse begins to intermit, do not stop the digitalis, but give it in sufficient quantity to maintain the result already gained.

If from the very start, in spite of prejudice, you use the ice bag, you will be rewarded by the gratefulness of your patient. If your sufferer has been an alcoholic, prevent delirium through its use, whiskey, if there is a tendency toward constipation, brandy, if the bowels are free. If not an alcoholic, cut both of these out. The diet should be generous, but without any form of meat or its extracts; germs grow rapidly where there is an excess of uric acid.

Fortunately, the open air treatment is advancing more and more beyond prejudice.

Venesection, though important in a few cases, should not be undertaken unless there is undue strain upon the heart, the marked distinction of which lies in the amount of venous stasis, that is not immediately relieved by free but cautious purgation. (The relief from veratrum viridi is only transient, but may be of service if you know when to use it.) Venous stasis is shown by persistent distention of the veins in the back of the hand, or the anterior part of the arm.

Do not be alarmed by a sudden rise of temperature, particularly on the third, fifth, or seventh day, as it usually shows the case is ending by crisis. To give depressing remedies here, in order to decrease the temperature, may mean the death of your patient. Leave such drugs alone.

After the disease has been conquered, ultimate recovery depends entirely upon the good judgment of the attending physician, treatment being the same as in any case of convalescence, which in its handling requires but ordinary skill.

From Dr. Edward E. Cornwall, of Brooklyn, N. Y., comes the following:

First I clear the situation by accepting the fact that there is no drug specific for lobar pneumonia, also recognizing that the only noteworthy biological specific which has so far been discovered is one of limited application, being useful only in about one third of the cases, and then only when given early. Even under favorable circumstances it is far from being an absolutely safe drug, and possesses some disadvantages for general use. There is no standard

and universally accepted method of treating this disease, so the therapeutic field is still open. Nature, working through the ages, has elaborated a method of treatment which is successful in a large majority of cases, and any plan, to be rational, must harmonize as much as possible with that which she seems to advocate.

The patient is kept in bed from the time the diagnosis is made or suspected until at least ten days after defervescence. Abundant fresh air is secured by appropriate ventilation, but the "cold air treatment" is not given; and especially is the patient protected from cold and draughts when afebrile, or nearly so, in order to avoid complications or a relapse. The aged and very young should be particularly protected.

A diet should be given which supplies not more than forty grams of protein, fuel of the value of not more than 1,300 calories, adequate rations of salts, vitamins and water, which is fluid, easy of digestion, and nonputrefactive, that is, does not favor growth of putrefactive bacteria in the alimentary tract, nor wash down the pneumococci in the mouth and throat; thus safeguarding against a most important element in the toxemia of pneumonia. Such a diet is supplied by the following: Seven and a half ounces of a two to one milk and barley water mixture, or an equal amount of peptonized or lactacidized milk, seven times a day; seven and a half ounces of orangeade made with the strained juice of one orange, one ounce of milk sugar, and water (or a similar fruit juice preparation), three times a day; thirty grains of calcium chloride and forty grains of sodium chloride, besides the salts in the other food, in divided doses; and water to make the total intake of fluid not less than ninety ounces.

Another special feature of this plan is extreme conservatism in the use of cathartics. This is, perhaps, its most distinctive feature, inasmuch as it constitutes a wide differentiation from the treatment of lobar pneumonia as generally carried out, and is directly opposed to one of the most cherished therapeutic traditions of the medical profession. I do not move the bowels artificially except in extraordinary circumstances, having found that if the patient is given the diet above described he, as a rule, can be safely and advantageously left undisturbed as long as the active period of the disease continues. If the bowels move naturally during this period it is well, and if not, it often seems to be better. Artificial evacuations are undesirable, because they increase the fluidity of the bowel contents and facilitate microbic activity therein, weaken the protective power of the intestinal mucosa, and predispose to abdominal flatulence, since they reflexly disturb the heart, which is often in an unstable condition in this disease. But in certain conditions I do move the bowels, viz., early in the disease, if no movement has taken place within twenty-four hours, and when much flatulent distension is present (which is rare, if the patient is fed as here described). But the evacuants employed are gentle ones, usually enemas of normal saline solution, soapsuds, or powdered ox gall solution, one dram and a half to the pint.

Symptoms are treated definitely, but very conservatively. Fever is never reduced except in pro-

longed hyperpyrexia, being considered part of nature's curative plan. Pain, restlessness, cough, and insomnia are treated by local applications of heat or, in the early stages of the disease, by small doses of morphine or codeine: opiates are never given near the expected time of the crisis. Diarrhea and vomiting are treated by stopping of all food or restriction to water or barley water. When there is tympanites, which is of rare occurrence in patients treated by this method, milk is excluded from the diet, or the diet is more severely restricted, and if necessary, the enemas above described are given; with, in exceptionally severe cases, a colonic irrigation, but with extreme caution, so as to safeguard the heart.

A symptom which calls for treatment more or less regularly is weakness of the heart action. My plan of heart stimulation is a definite one, flexibly planned to meet special indications. The first stimulant used is strychnine sulphate, one sixtieth of a grain, every four hours. If more stimulation is needed, tincture of strophanthus, two and a half minims, every four hours, is given. If still more stimulation is required, the dose of strychnine is increased to one thirtieth of a grain, and that of tincture of strophanthus to three minims, and perhaps caffeine citrate, or sodiobenzoate, two grains every four hours, is added. This is enough stimulation in most cases. If the tincture of strophanthus is not well borne, because of idiosyncrasy, I give instead strophanthin, hypodermically, one thousandth or one five hundredth of a grain every four hours. In case of sudden failure of the heart, with extensive pulmonary edema, I give strophanthin, hypodermically, one thousandth of a grain, but, after such a dose, no more strophanthin for twenty-four hours, though the strychnine and caffeine may be continued. The sodiobenzoate of caffeine may be given hypodermically.

The practical results of this plan of treatment, used almost exclusively by me in hospital and private practice for more than five years, have been so encouraging that I recommend it with considerable confidence.

Dr. Gustavus Eliot, of New Haven, Conn., writes:

If the patient is seen within a few hours after the commencement of the attack, which is usually indicated by a chill, accompanied and followed by fever, an attempt should be made to abort the disease, that is, to quickly cause disappearance of symptoms, or at least to shorten their duration. With this object in view the patient should immediately be put to bed in a warm room, into which fresh warm air is constantly admitted. He should be well covered with woolen blankets, and bottles of hot water should be placed at his feet, and beside his body.

If there is much pain in the chest, a subcutaneous injection of one fourth of a grain of sulphate of morphine should be administered. If not severe, five grains of pulvis morphinae compositus should be given every four hours. Two hours after the administration of the morphine five grains of sulphate of quinine should be given, and repeated every four hours, for three or four days. After twenty-four or forty-eight hours of this treatment, the pa-

tient may feel very much better, and the morphine may be discontinued. If the symptoms have not all disappeared, and if the cough is not very troublesome, carbonate of creosote should be given:

R Creosoti carbonatis, ʒiv;
Acacie, ʒiv;
Syrupi, ʒiii;
Aque cinnamon, ad ʒvi.

M. Sig.: Shake. Give one dessert-spoonful every two hours.

If the bowels have not moved, one dram of sulphate of magnesium should be given in half a tumblerful of water, and repeated every two hours, if necessary.

The patient should take a tumblerful of fresh cow's milk every two hours, and if there is much disturbance of the stomach, with a coated tongue, one teaspoonful of essence of pepsin should be given every two hours. It is not unpleasant to take, and at least does no harm.

If the cough is troublesome, and expectoration difficult, a combination of ammonium chloride, ipecac and codeine is often useful:

R Ammonii chloridi, ʒiv;
Syrupi ipecacuanhae, ʒii;
Codeinae sulphatis, gr. viii;
Syr. sarsaparilla comp., ʒss;
Aque, ad ʒvi.

M. Sig.: Shake. Take one teaspoonful, in one third of a tumblerful of water, every two hours.

If the patient is restless, or does not sleep, fifteen grains of bromide of sodium should be given, in water, every four hours. If this does not act give chloral hydrate, commencing with one dose of twenty grains, and following this with a ten grain dose every half hour until he falls asleep, a treatment especially useful if the patient has been an alcoholic.

When the heart's action becomes weak and rapid, half an ounce of whiskey should be given every two hours, and later the size of the dose or the frequency of its administration may be increased. This is particularly important in alcoholic patients.

If the signs of circulatory failure increase with the progress of the disease, and in spite of alcoholic stimulation, sulphate of strychnia may be given hypodermically, in doses of one thirtieth of a grain, repeated every four hours.

If symptoms of pulmonary edema are discovered sulphate of atropia should be given hypodermically, in doses of one one hundred and twentieth of a grain, repeated after eight hours.

Morphine must be entirely avoided in the later stages of the disease.

External applications contribute to the comfort of the patient and should not be neglected. At the beginning especially if there is pain, a mustard paste should be applied until the skin has become red. This should be followed by hot flaxseed poultices, which must be not too moist and, after a few days, a stimulating liniment should be substituted for the poultices:

R Olei terebinthinae,
Linimentii saponis, }
Limentii camphorae, } aa ʒii

M. Sig.: Shake. Apply to the chest every four hours.

Finally—try to use common sense in the treatment of the patient, but do not give him up as long as he can swallow nourishment and medicine. If he is a Roman Catholic do not put off until too late sending for the priest.

Dr. J. R. K. writes: "I have no objection to the above that:"

Promiscuous drugging has done an untold amount of damage in the treatment of pneumonia, especially a thoughtless use of antipyretics and often of alcohol.

A reliable and competent nurse—a day and a night nurse if possible—is most essential. The room should be well ventilated and well lighted and the windows kept open day and night. Apply an ice bag to the head, and order colon irrigations twice a day. Alcohol sponges should also be given, as this adds greatly to the comfort of the patient. The diet should consist principally of milk and digestible carbohydrates. Thirst is relieved by allowing as much water as desired. Particular stress should also be laid upon the cleanliness of the upper air passages.

At the outset, I order calomel, followed by a saline, next morning. For the cough, codeine sulphate, one fourth of a grain every four hours. At times morphine sulphate, one eighth of a grain, is necessary. Where there is intense pain an ice bag on the chest is invaluable, though at times heat seems to afford more relief. For the fever use hydrotherapy and no antipyretics. For restlessness and insomnia, either veronal, trional, or codeine is advised. A good prescription is:

R Veronal, gr. ʒss;
Cod. sulph., gr. ʒi.

M. F. Catapulta No. 1. Mfrr. Take No. 1.

Sig.: One to be taken every two hours.

Owing to the difficulty of obtaining veronal, a fair substitute is:

R Sodii bromidi,
Kali bromidi,
Ammonii bromidi, aa ʒiii;
Aque cinnamon, q. s. ad ʒiii.

M. Sig.: One teaspoonful every four hours.

It is, after all, the heart and bloodvessels which need closest watching. Often the following is given:

R Tr. digitalis, ʒss;
Ammonii carb., ʒiii;
Mist. Stokes, }
Mist. glyster, compo. } aa q. s. ad ʒiii

M. Sig.: One teaspoonful every four hours.

Where the heart needs stimulation, intramuscular injections of camphor in oil, three grains every four hours, alternating with intramuscular injections of ten minims of a 1 to 1,000 solution of epinephrine is of great benefit. The dose given and intervals between doses depend on the general condition of the patient, his blood pressure, quality of heart sounds, etc. Where there is no delirium, and nervous symptoms are not marked, caffeine and sodium benzoate is given. Extreme caution should, however, be used in administering cardiac stimulants as overstimulation of the heart spells disaster.

For cyanosis and marked dyspnea, oxygen may be tried, though I believe its benefits are practically nil. Pulmonary edema is treated by adrenaline hypodermically, atropine and cupping. During convalescence, a change of air is advised and the patient is usually given:

R Sig. Fennel or aniseed poultice, ʒvi;
Sig.: One teaspoonful twice four hours.

(To be continued.)

Medicine and Surgery in the Army and Navy

GUNSHOT WOUNDS OF THE EXTREMITIES.

By J. RUDIS-JICINSKY, A. M., M. D.,
Chicago.

In the beginning of the present war in Europe in 1914 there were only two American missions in Serbia; one of the American Red Cross in Belgrad under the direction of Doctor Ryan and the other our Bohemian-American unit—"Frothinghams"—at

Gevgelija and later on in Uskup. In November two more American Red Cross units arrived in Gevgelija, and worked in complete harmony with a few of our members left there. During the first five months of our stay, the work was simply beyond our strength. At that time Serbia was fighting every day and was making headway against the furious and constant efforts of invasion by the Austrians. The Serbians had heroically maintained their positions and twice defeated the enemy in August and in September, when six Austrian army corps were held in the mountains west of Drina and around the mountain of Matchokanien, a few miles from Kupanje. At a cost of over 30,000 men, the splendid fighting peasantry of Serbia

repulsed the invaders on Cat's Leg Mountain, which was lost and regained eight times before it was at last firmly held by the defending army. Grave as

were the Serbian losses, they were less than those inflicted upon the Austrians, who lost besides thousands and thousands of prisoners of war, wounded or not. The hospitals all over Serbia were overcrowded and our two pavilions were overflowed after constant attacks in the north, so that we had to be content with many very simple and even primitive procedures in our work for lack of material, circumstances which made for more conservatism and more modern methods, especially in surgery of the extremities, this being the most important part of our activities.

Over two thirds of the wounded brought to base hospitals sustained wounds of the limbs, half of them fractured, not mentioning gangrene, of which in December, 1914, and in January and February, 1915, we had very many cases from the mountains and trenches on Crnabara, Paraschnitz, Chabatz, Drina, etc. The majority of these cases we found in men who were recovering from typhus and frost-bite, in completely exhausted older men, weak and poorly nourished, and in men convalescing from wounds previously received. In the last four years the army had fought first against Turkey; then against Bulgaria, struggling with epidemics of typhus, cholera, recurrent fever, dysentery, etc., twice against Austro-Hungary, and at last again in December, having not much time to recover. Finally Serbia was attacked by one of the great military empires of the world, Germany, in connection with Austria, Bulgaria, and Turkey, in November, 1915. The Serbs were caught between the lines of enemies and the terrible retreat through Albania, and great



FIG. 1.—Perspective of section through the thigh with a drainage tube in situ.



FIG. 2. Fracture of femur; bone crushed by a bullet; fluoroscopic image. Note the fine grain of the screen. Two wounds, one perforated, the other with a bullet deep in the soft tissues; deformed.

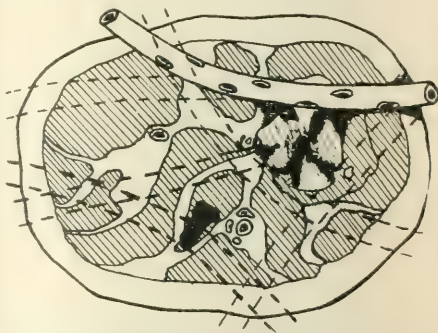


FIG. 3.—Drainage of thigh. Middle third of femur crushed; two wounds, one perforated, and the other with a bullet deep in the soft tissues. Dotted lines indicate paths available for tubes.

suffering followed. In my previous articles on Serbia (1) I have described our work in general, but I would like to discuss here the experiences of the busiest five months of our day and night work, the times between this period and our departure in October, 1915, for home being comparatively easy. We have learned many important points especially worth knowing now that we in America are more directly concerned.

Remembering absolute cleanliness, we always drained every suspicious wound, removing the foreign bodies in individual cases as early as possible. The dangerous position of the projectile was demonstrated by Röntgen rays at once, and if necessary, even left for encapsulation, when the surrounding tissues were of such a character that there was no chance of infection. Otherwise we have washed and drained every contaminated wound, making our incisions clean, and in such a way as to soon secure an aseptic condition for the wound and for everything which was brought in contact with it. In the first months of our work we used English Crook's tubes, bought in Athens, because our American tubes

were broken during the transport. Later we had better ones made in the United States and adaptable to our portable apparatus.

In regard to amputations, we have seen surgeons probe for sequestra, bullets, and foreign bodies, amputate, resect and disarticulate at the first opportunity, thus leaving sometimes boneless arms and legs, but in many of our cases, in view of the lessons taught, we never used the probe, and had no primary amputations at all, within the first ten days, except in the presence of actual gangrene, and then we had to observe the spontaneous elimination of necrosed tissue and behavior of tissues beyond the line of demarcation, finding with the help of x ray how far the formation of gases progressed, where to cut, and whether the wound should remain completely open or not.

We never removed healthy fragments of bony tissue, primarily, even if they were loose and free. Not causing trouble, they were left alone, unless necrosed or lying in very superficial positions, so that they could not be replaced, and coaptation secured even on fluoroscopic observation.

When fragments projected through the skin we usually cleaned the parts and painted the skin with tincture of iodine; we pressed gently upon them, bringing them in position, under anesthesia, if possible, reforming the whole process in a dark room with fluorescent screen. In cases of profuse and secondary hemorrhage, or traumatic aneurysm, we simply removed hematoma and tied the vessel or vessels. A high percentage of recoveries rewarded this surgical intervention under strict aseptic precautions.

The late Doctor Kara, who died of typhus in Uskup, was very successful in such cases. When direct compression had proved unsuccessful, he applied an Esmarch bandage at once and under anesthesia opened the wound freely from above downward, exposing completely the organized blood clot. The mass was removed and the tissues wiped dry with sterilized compresses. The whole wound was exposed, and bone, muscles, vessels, nerves, and foreign body removed if present. An assistant carefully loosened the band without taking it off, and ligature was applied to the bleeding vessel, the oozing here and there being readily controlled by simple pressure.

By the open method we also found that many larger sequestra and loose fragments had a very good chance for life, if the site of the fracture had escaped infection. They themselves were certainly never the direct cause of infection. During the aseptic operations we often took out the fragments of bones, kept them wrapped in gauze, proceeded, and returned the pieces simply to their original position or transplanted to other patients and bony parts of the body, if necessary. In trephining we replaced the bony discs, which served as a stimulus for new bony formation and perfect union.

A considerable proportion of our work consisted in the treatment of fractures, as stated already. Good common sense, mechanical skill, and thorough knowledge of the injury under the x ray examination and observation gave us opportunity for better manipulation, reduction, reposition of fragments, and complete fixation, even with the most primitive splints in securing desirable results, the correct diagnosis being made early in every case. We often had to extemporize an efficient dressing from the material at hand; we made wood or paper splints ourselves and adapted them to individual cases.

The benefit to our patients seemed to be greater than with ready made special metallic splints and other material prepared with dressings of special patterns. In the case of older patients, the wealth of all our book knowledge and our familiarity with old and recent literature usually went to pieces when our fluoroscope spoke, showing us that our responsibility could not terminate with the restoration of the maximum degree of function of the injured limb, but remained through the whole time of treatment up to the



Fig. 1. Fracture of middle third, right; bone crushed. Fragments and sequestra not in position. Anterior view.



Fig. 2. Fracture of middle third, right; bone crushed. Fragments and sequestra not in position. Anterior view.

FIG. 4. Traumatic aneurysm; Esmarch's bandage applied; Long cut from above downward; blood clot and bullet removed; floor of the wound cleaned and dried; fracture, vessels, nerves, etc., exposed; bleeding vessels ligated; retractors in position.

expiration of the time necessary for healing of the fracture by bony consolidation. Mistakes had constantly to be corrected. During the transport of such cases we usually employed, after



FIG. 7.—Gunshot wound in the right hand; radius crushed by a penetrating bullet, lodged laterally on the other side. Anterior view as the image appeared on the screen.

an x ray examination, long plaster splints with fenestra opposite the wounds, in order to afford the required security and rest of the injured limb, with special consideration for the aseptic course of the wound character and position of the bullet, and the nature of the injury to the soft parts.

If necessary, in fracture of the femur, we made a partial cut in the plaster over a protective band of wadding from above downward in front, without separating the edges. This allowed examination at all times

of any strangulation. Another plan was to apply a long rectangular plaster splint as a permanent dressing in suitable cases with extension from a fixed plaster collar above. In fracture of the humerus the axilla remained open, if possible. Apposition of fragments was secured and the limb was arranged in a suitable direction, the plaster being applied accordingly with a complete jacket around the body and fenestra over the wounds.

We certainly could not neglect another x ray examination after the application of the plaster or splints and inspection of the surroundings of the patients. Some cases exhibited a tendency to supuration, with some inherent character of the tissue due to condensation and surface destruction resulting from the force and velocity of the projectile which crushed the bones. The track itself usually was not bleeding very much at the wound of entrance, but might be infected deeper perhaps, the inflammation progressing later locally along the vascular sheaths of main vessels and nerves and between the ligaments,



FIG. 8.—Lateral view of the same case as that in Fig. 7. The bullet was found lying laterally to the bone and was easily removed under x ray observation.

muscles, etc., forming multiple abscesses which involved sometimes areas far from the original injury. We also had to count, as Tadlicka wrote during the Balkan War from Belgrade or Makins, on the clinical signs and course of the wounds in South Africa: "The purity of the atmosphere and the apparently innocuous nature of the dust on the highveldt when the camp is a fresh one, must also be credited as important factors in the happy re-

sults, which have been attained up to the present."

From a practical point of view of conservatism we have to repeat that we drained suspicious wounds whether they contained a foreign body or not, thus protecting our patients from complications and observing the nature of the injury with the local and constitutional signs. The wound was washed with hot normal saline solution, a few grains of oxalic acid, or a solution of potassium permanganate. If necessary, all foreign bodies were removed, such as small pieces of projectiles, particles of clothing, dirt, etc., at any rate all that could be removed without any risk to the patient. This was followed by free drainage along the paths available for tubes, selecting anatomically the proper area of safety and avoiding the dangerous spots. We have used good sized drains and long enough, guarding the vessels and nerves against pressure and bending or clogging of the tubes, which could be readily seen on introduction or *in situ* on the screen. The drains were placed, as our colleagues of the French and Russian missions have done, in such a way as to allow the change of dressings without interfering with apposition of the bony fragments in a fracture.

One thorough drain was usually enough at the wound of entrance and exit, or we made a counteropening at the lowest point, if there was only one wound. We had to attend such cases perhaps oftener than others, but the clinical experience taught us that Nature repairs damaged tissues slowly perhaps, but better than the hand of the most skilful surgeon even in his beautifully flapped and covered stump. In other cases we had complete paralyses or severe neuralgic pains during and after healing of wounds due to concussion or contusion of nerve trunks, partial or complete nerve division, with deep suppuration and occasionally diffuse cellulitis. Some of the displacements of nerve

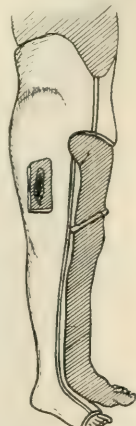


FIG. 9.—Plaster of Paris appliance. Long rectangular splint with a partial cut in the middle over a protective band of wadding from above downward in front, with a window over the wound of the fractured femur. Ready for transportation.



FIG. 10.—First fluoroscopic examination of a fracture of the tibia and fibula, middle third, with a lacerated infected wound in very bad condition. The patient was received in our hospital three months after the receipt of the injury. Note the light area of the image in the middle of the screen, showing the progress of actual gangrene in the soft tissues and the drying away of bony tissue of fragments not in position.

ends were brought together directly, perineurotic or panneurotic sutures made on surgical interference, or neuroplasty done. If gangrene could not be prevented by the most careful treatment of the fractured bone, vessel, and nerve wounds, with all the indications clear, our Doctor Czaja usually amputated the limb after consultation, most careful reexamination, and the consent of the patient. Even in the most hopeless cases, the freeing of tissues of organisms of infection depended largely on individual care, drainage, the individual living cells, healthy granulations locally, and the reaction of the whole cellular tissues of the body of the injured. The practical value of antiseptics and the superficial routine treatment of the infected wound did not differ very much, if in each case the pathological and chemical changes were carefully watched.

In the beginning of this war we had no special treatments or absolute methods, miraculous or otherwise, but had to depend rather upon the teaching of Lister, Billroth, Senn (2), Fenger, Zahradnický, Lexer, and Callot (3), and, as Bevan said the other day, "on the problems of wound repair, infection, and the processes by which an organism frees itself from infection, separating the living from the devitalized tissues, the extrusion, digestion, and encapsulation of foreign bodies." In uncomplicated flesh wounds of the extremities our treatment was simple in the extreme. It consisted almost entirely in the application of pads of dry iodoform gauze—aristol, boric acid, and dermatol—and cotton, after the parts surrounding the openings and the wounds themselves have been painted with tincture of iodine. In many cases this painting alone was sufficient. Fixation, beyond that resulting from the bandaging of the dry dressings, has rarely been needed. Few deaths occurred on the field from primary bleeding or from intermediate hemorrhage at the hospitals. In ugly and lacerated wounds and those due to explosive bullets an injection of antitetanic serum was given at the first opportunity. Among our cases were men who had been pierced by bullets, particles of shrapnel, etc., in almost every direction, especially in groin and buttock, and in both upper and lower limbs, shoulder, elbow, and knee joints. These wounds, with the exception of a few, healed very soon, leaving no symptoms whatever, the tendency to run an aseptic course being marked. This, as Makins states, "depending on the smallness of the wound, the aseptic nature of the bullet, and the fact that foreign bodies, such as pieces of clothing, are comparatively rarely introduced."

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1000 BLUE ISLAND AVENUE.

Lloyd George's Appeal.—In answer to Lloyd George's appeal to the American people for immediate help the American Women's Hospitals will try at once to establish throughout that part of France which again has been devastated by the German drive a number of hospitals staffed entirely by American women doctors.

A WELCOME GIFT

The war seems to have inspired the concrete with an almost uncanny ambulatoriness. When the overwrought, tired surgeon, doctor, röntgenologist, bacteriologist, would rather be plumped in a sofa of



Fig. 1. Laboratory on wheels, with motor chassis, for bacteriological laboratory.

despair because of inadequate accessories, there appears on the horizon a kindly, gigantesque motor with all he wants, a kind of fairy tale come true. Of the last invention we give illustrations. It is a complete

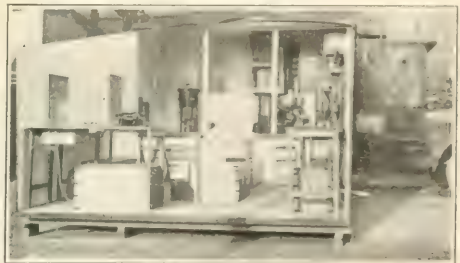


Fig. 2. Laboratory on wheels, with motor chassis, for bacteriological laboratory.

motor bacteriological laboratory for field work which packs on a three ton motor chassis. The complete laboratory on wheels is shown in Fig. 1. Fig. 2 shows the car with one side let down, but with all



Fig. 3. Laboratory on wheels, with motor chassis, for bacteriological laboratory.

the equipment still packed in the car. The equipment includes sides, floor, and cover for an annex having 144 square feet of space and provided with a water-tight canvas cover. Fig. 3 shows the annex erected and closed. On the top may be seen a small tank kept supplied with water by means of a force pump. Fig. 4 shows the annex with the side and top off, but with all the equipment in place for active work. The car itself furnishes seventy-five square feet of space,

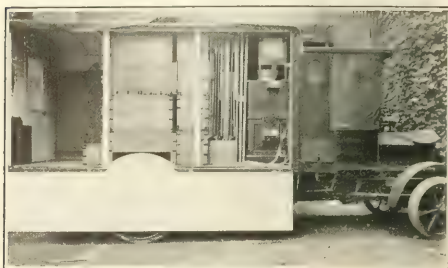


FIG. 4.—Interior of the laboratory with annex set up and apparatus in place, before roof and side are put in place.

making a total of 219 square feet available, which furnishes all the room required for a complete bacteriological equipment according to the Tillmant-Garstang system. The laboratory, complete in every detail with all the necessary equipment, was presented to the Royal Army Medical Service, Great Britain, by Mr. Henry S. Wellcome, a well known American who has resided in London for many years, occupying an important place in the business, scientific, and social world. It was Mr. Wellcome who founded the Scientific Research Laboratories at Khartoum in Egypt, and the Medical Historical Museum in London. It is understood that he contemplates presenting a similar laboratory and equipment to the Medical Department of the United States Army.

MEDICAL NOTES FROM THE FRONT.

GENEVA, January 20, 1918.

I want to give a few notes on the important question of the pathology, symptoms and treatment of the effects of asphyxiating gas as used by the Hun; not referring to the effects of the lacrymogenous shells which apparently contain trioxymethylene or tribromate of benzene, as they are not usually serious and the soldier generally recovers within a few hours.

Quite different are the toxic effects of the chlorine gases. Chlorine is a gas which lends itself admirably for the purpose for which it is destined. It is much heavier than air and when escaping, it tends to lay over the ground and will not be dispersed by a light wind.

The simplicity of the manufacture of chlorine must also have been in the minds of the German chemists when deciding upon its choice. To make it, the action of sulphuric acid on sea salt is all that is required, or it can be produced by the action of sulphuric or hydrochloric acid on chloride of lime.

When everything is ready for an attack, the Germans choose the moment for liberating the gas.

In each army corps they have established a meteorological service which keeps them exactly posted on the atmospheric conditions. Two conditions are essential, namely, 1, a favorable wind and 2, hazy weather.

The wind blowing in the enemy direction must be rather mild, one which will not disperse the waves of gas clouds, so that a misty day is the one most favorable. Mist also has the great advantage of partially hiding the gas waves at the time of their formation and it also makes the gas denser so that it rolls over the surface of the ground. It likewise serves as vehicle for the chlorine, only a minute part of which transforms into hydrochloric acid. Rain would cause an almost total transformation into acid.

The Germans usually select sections where the ground slants downward toward the enemy's line, a fact readily understood since chlorine gas tends to descend on account of its density.

The above conditions being fulfilled, the gas is emitted. At a few metres from the Hun trenches a greenish yellow cloud, ten to fifteen feet in height, will be seen to rise. The cloud is not uniform, but rather made up of volutes, rolling over each other as they advance. The rapidity of their advance depends upon the wind and the pressure under which they have been emitted, but it is always more rapid than a man can run. Even the cavalry must gallop in order to escape the waves. The odor of chlorine extends for a great distance, likewise its effects. In a village situated five miles away, the men were bothered by the gas and it even had a lacrymogenous effect, while the chrysanthemums which were in full bloom became dry and withered. Such, briefly, are the general conditions in which a gas attack is made. Now for the medical aspects.

Chlorine is a toxic and irrespirable gas, and, just so soon as it enters the animal organism, it sets up varying disturbances according to the amount absorbed. Therefore, one can divide the cases into mild poisoning, severe poisoning and fatal intoxication.

In the mild cases about the only symptoms presented are those of a slight tracheobronchitis which clears up quickly under appropriate treatment so that the soldier can return to the front very soon.

This mild type is met with in soldiers who have inhaled the gas in very small amounts, either because they delayed in putting on their masks or because the gas filtered through in minute quantity.

Quite different is the clinical picture in cases of severe poisoning. The subject is cyanosed, almost violet. The face, covered with sweat, offers an expression of extraordinary agony. There are black rings around the eyes; the half opened mouth is filled with a frothy, bloody secretion, rejected by coughing. Dyspnea is intense and respiration reaches from forty to fifty per minute. The subject walks with difficulty, bent over and presses his chest with his hands. In vain he tries to find a position which can ease or regulate his breathing and when brought into a room he cries for the open air. A jerky cough constantly harasses him and gives rise to pain in the intercostal spaces. Respiration becomes more and more rapid and air hunger

increases. Such is the picture offered in severe cases when they first come to the surgeon. Let me now give a detailed consideration of the symptoms.

Examination of the respiratory tract reveals an exaggerated sonority over the entire pulmonary area. By auscultation a true pulmonary tumult is revealed. With rhonci and sibilance numerous subcrepitant râles may be detected. Cyanosis is intense, the cheeks are blue.

The expectoration is frothy and bloody and of extreme amount, so that in a few minutes the patient will fill a sputum jar. Dyspnea is marked; the patient sits up in bed with the trunk bent forward. In other words, we have all the symptoms of acute pulmonary edema. In the vast majority of cases the edema arises at once with all its characteristic signs, but in some patients it requires several hours for its development.

The digestive tract offers a heavily coated tongue; anorexia is complete and thirst acute. The patients continually ask for water, probably with the idea of calming the burning sensation they experience in the throat and epigastrium. But the ingestion of fluid is very painful because most always deglutition is painful. Usually there is vomiting before the exhibition of ipecac, which, as we shall see, is part of the treatment. The vomitus is usually blood streaked, stringy and with a strong odor of chlorine. The lesions of the gastric mucosa explain both the epigastric pain and the bloody vomitus.

The intestinal symptoms may be summed up in almost liquid stools, and these are present in most cases.

The liver is usually painful. The pain may be spontaneous and quite sharp under palpation. Icterus is not constant, but has been met with, and the hepatic lesions found at autopsy explain this symptom fully. The spleen does not appear to be involved as it is not increased in size nor painful on palpation.

Palpation of the kidneys is not painful and the urine contains nothing abnormal. In quantity it is always diminished, the twenty-four hour total being in the neighborhood of a pint.

The pulse is rapid, badly struck and intermittent. The heart appears to be somewhat increased in size, particularly the right ventricle. The apex is lowered and displaced toward the sternum.

Nothing has been noted, so far as I know, in the motor system or the sensibility. The reflexes and pupils offer nothing abnormal. However, a supra-orbital headache is usually complained of.

The temperature ranges between 99.5° F. to 101° F. but rarely goes above this point during the phase of the acute manifestations.

Such are in brief, the general symptoms of severe poisoning, but the evolution is far from being the same in every case. It differs both in onset and end. Many patients, perhaps, even almost all, come to the surgeon with a fully developed pulmonary edema with all its characteristic symptoms—dyspnea, cyanosis and expectoration. In others, few in number, the pulmonary phenomena seem longer in developing and only a few scattered bronchitic râles can at first be de-

tected. But at the end of about three hours, that is, about six hours after being exposed to the gas, pulmonary edema rapidly develops.

Yet some patients recover quickly, the evolution of the process not lasting more than a week or ten days and they generally escape complications. These subjects are most likely to be young and strong.

Other subjects drag along for a fortnight or a month and pay a large tribute to the complications. They are older men, but unquestionably the past state of the lungs enters largely into account. Many had presented signs of pulmonary emphysema or had been subjects of bronchitis, while still others had a less vigorous myocardium so that they could not resist the effects of the gas.

The evolution of gas poisoning can be conveniently classified under the following four types, namely: 1, that with a sudden onset; 2, with a retarded onset; 3, a type of short duration and, 4, a prolonged type.

As to the complications arising during the evolution of the acute accidents we have the *primary*; as complications following the acute accidents, the *late* or *secondary* complications and, last, the *distant* complications.

The primary complications are the result of coughing, viz. pulmonary emphysema and subcutaneous emphysema. The violent jerky cough dilates the pulmonary alveolæ, hence the emphysema. After recovery, the signs of emphysema remain.

Occasionally, rupture of an alveolus occurs into the interlobular tissue or under the visceral layer of the pleura. Pneumothorax does not occur, but the air pushing its way through the connective tissue through the hilum attains the mediastinum and then the neck, arm, and thoracic walls.

Complications following the acute accidents involve the lungs and stomach. In order of frequency the pulmonary complications are bronchopneumonia, pneumonia, and fetid bronchitis. Pulmonary abscess or gangrene is very uncommon, if indeed they ever arise. The pleura likewise does not seem to be involved.

As I have already said, most patients offer evidence of gastric intolerance, lasting only for three or four days, but there are instances where symptoms of chronic gastritis develop.

During the acute accidents, gangrene from arterial embolus has been met with, but this process must be rare. Some conjunctival icterus or even a yellow tinge of the skin will be often observed, showing that the hepatic gland has been touched, but hepatic insufficiency is uncommon.

Regardless of emphysematous pulmonary catarrh one will meet as distant complications cardiac lesions, vertigo, and gastric disturbances. The cardiac lesions consist in a marked tachycardia with a sharp shock at the apex. These patients complain of exertion dyspnea, while others offer a systolic murmur over the xyphoid appendix and a jugular venous pulse. A case of tricuspid insufficiency has been recorded.

Vertigo is fairly common and appears to be re-

lated to some pulmonary factor and provoked by a hyperexcitability of the pneumogastric and its centres.

The tardy gastric disturbances have been met with in subjects who had never before complained of their stomach, but these cases are not frequently encountered.

In my next communication I will tell of lethal gas poisoning, likewise the pathology and treatment of the process, but in ending now I would urge that we employ, in order to attain our just ends in this world struggle for freedom from tyranny, the same arms as those used and devised by the sinister race in its endeavor to conquer mankind. Brute force can only be combated by brute force, unfortunate as this necessity may be. Let my confrères and compatriots come to their senses and awaken to the fact that Teuton commercial propaganda has been the means, during the past twenty-five years, of enticing our medical tyros to the lecture rooms and clinics of Germany, where Teutonic science (*sic*) has been instilled in broken English into the pates of those who knew not the tongue of Kultur. My Boston confrères need only recall the reign of King Franz Pfaff in order to perceive the justice of my reflections.

CHARLES GREENE CUMSTON.

MEDICAL NEWS FROM WASHINGTON.

Beginning With the B. G. Our New Hospital Ships. - Regulations Concerning Uniforms.—Estimates of Cost in Providing Extra Medical Officers.—Additional Duties for the Public Health Service.

WASHINGTON, April 1, 1918.

Examinations of men of military age in the selective draft have resulted in a large number being rejected because of physical and mental defects which originated in the period of growth and development. Many defects were preventable and could have been avoided, if proper remedial measures had been taken during childhood.

The authorities of the Public Health Service consider the development of measures for improving the physical and mental supervision of children during school age leads directly to improving the physical condition of the people, so Congress has been asked to appropriate \$100,000 for special studies of and demonstration work in school and mental hygiene. No part of the appropriation is to be available for the work unless the state, county, or municipality in which the community is located, agrees to pay one half of expenses involved.

* * * * *

The naval base hospital, with personnel largely from the Leland Stanford, Jr., University, in California, has arrived safely in the war zone, and is located in Great Britain. It will not only care for the sick and wounded of the navy, but also be available, so far as facilities will permit, for use of the sick and injured of the American expeditionary force and of the allied forces.

The naval medical authorities are continuing their efforts to provide in this country additional hospital facilities. More beds have been supplied, and addi-

tional space secured at many of the hospitals now operated by the navy.

The U. S. S. *Mercy*, formerly the Ward liner *Saratoga*, has been converted into a hospital ship and has joined the Atlantic Fleet. The *Havana*, formerly of the same line, and renamed the *Comfort*, will also soon be ready to join the fleet.

* * * * *

Instructions regarding uniforms have been issued from the office of the Public Health Service. Until further advised, the procuring or wearing of blue uniforms of officers of the service will be optional. Officers engaged in field work at marine hospitals and quarantine stations, serving on service boards, or presenting themselves before boards, shall wear olive drab or khaki uniforms. Interns at marine hospitals will be provided with white uniforms from station supplies.

* * * * *

Supplemental estimates submitted to Congress for the Public Health Service call for \$1,917,275 in addition to the amounts already provided for the present fiscal year.

An estimate of \$72,200 is made for pay, allowances, and commutation of quarters for commissioned medical officers and pharmacists. There is urgent need for increasing the number of officers in the service on account of the extension of activities of a permanent nature, such as studies and demonstrations in rural sanitation, industrial hygiene, and school and mental hygiene, which necessitate a trained permanent personnel. Moreover, Congress has recently appropriated funds for the enlargement of marine hospitals, and the bureau of war risk insurance has stated that it is the intention to utilize the hospitals of the service for the treatment of officers and enlisted men who have been discharged from the army and navy for disability, that is, as far as the facilities of the hospitals are available. This also necessitates additional officers.

There is also an item of \$179,620 for pay of acting assistant surgeons (noncommissioned officers), an amount necessary to employ additional acting assistant surgeons for emergency work, especially in extra cantonment sanitation, temporarily replacing commissioned medical officers at marine hospitals and other places in order to utilize these trained officers as directors of the different districts. Additional duties have been imposed on the Public Health Service, and, to meet the emergency, an ample number of medical officers is absolutely indispensable. Congress appropriated \$100,000 for this purpose for the fiscal year 1918, and officers have already been appointed, whom it is necessary to continue in the service, requiring an annual appropriation of \$114,620. Additional camps will be established and large government industrial plants are now in process of construction; and, in order adequately to sanitize the surrounding areas and to safeguard the health both of the soldiers and civil employees, an additional number of acting assistant surgeons must be employed. A conservative estimate places this number at a minimum of thirty to twenty at \$2,000 a year and ten at \$2,500.

Editorial Notes and Comments

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ONTARIO AND SOCIAL DISEASES.

Venereal diseases are to be fought in Ontario with legislative authority, the Government having passed a law providing for the machinery, a law based upon a three months' investigation conducted by Mr. Justice Hodgins. That investigation resulted in a report as to the extent of feeble-mindedness in Ontario, as well as social diseases. Mr. Justice Hodgins gathered the views of many medical men, social workers, and others interested in the two problems, and the bill prepared by him will endeavor to grapple with the question. It is asserted by some who claim to know that the two questions, intimately associated, will come under the authority of the provincial and municipal health administrations of that province. The act, itself, may be said to be more or less of a framework, as it leaves practically the most important details to be worked out by the health authorities under regulations provided from time to time as a better understanding and consideration of the conditions come to be realized.

The act provides that if any person be under ar-

rest, or convicted of any offense of the Criminal Code of Canada, or any Ontario laws, he or she may be examined by a physician. If found infected, they may be treated as the health officer may determine. They may be detained or even isolated. In the second place, where any medical officer of health, district or municipality, has reason to believe that some one person is a danger to the community by reason of being infected with venereal disease, he is empowered to require said person to produce a certificate from a qualified medical man to the effect that he is not so infected. Failing this production, the medical officer of health has power to direct an examination, and if infection be found he may treat him or her, and detain and isolate if necessary.

The hospitals of the province receiving governmental aid are required to make provision for examination and free treatment of all persons suffering from these diseases; and while the general principle of the act is averse to segregation of affected persons, if it should become necessary to confine any one, there is to be no special institution, for it is not meant in any way to give publicity to these cases. Provision is also made to have all such persons treated by a duly qualified physician.

The act seems to have a very material flaw—namely, allowing druggists to sell remedies without a prescription from a physician. It appears that a special committee upon which sat all the doctor members of the legislature favored the "counter prescribing" clause, but of course that does not say that they all affirmed that principle; indeed, one physician in the house took very strenuous objection to any such act, so it would appear that the druggists have the privilege of diagnosing and treating venereal diseases in Ontario, for that is what it amounts to when they are allowed to sell any of the various and multiple remedies on the market. It is unfortunate that any such clause should have been inserted, even though, as pointed out, the provincial health authorities have full power to give or refuse approval of any remedy prescribed by the druggists. It seems to be simply usurping the rights of a qualified medical man and giving powers over his head to the medical officer of health in the matter of diagnosis and treatment. It, therefore, sanctions "counter prescribing," and as time goes forward the wedge will be driven deeper and deeper into the rights of the medical body.

A COMPLICATED NARCOTIC LAW.

The narcotic drug committee of the legislature of the State of New York have introduced into the Senate as bill No. 951, an act to amend the public health law so as to regulate and control the sale, prescribing, dispensing, dealing in, and distribution of cocaine and opium and its derivatives. The proposed act provides for a department of drug control with a commissioner at its head with a salary of \$6,000 a year, with three deputy commissioners at salaries of \$3,500 a year; a secretary at \$3,000 and a counsel and such employees as the commissioner may deem necessary. On reading the bill one is surprised at the complexity of its provisions, and at the elaborate and expensive machinery which is to be provided for its enforcement.

Aside, however, from this feature of the measure the point which will interest physicians particularly is the complicated provisions with which they must comply in the course of practice. These are set forth in the following excerpts from the bill:

PHYSICIANS. A physician may in the course of the legitimate practice in good faith of his profession and for the purpose of relieving or preventing pain or suffering on the part of a patient, or to effect a cure, administer, prescribe, or dispense cocaine or opium or its derivatives as follows:

He may upon an unofficial prescription blank issue a prescription which does not contain more than five grains of cocaine, or more than thirty grains of opium or more than six grains of codeine or more than four grains of morphine or more than two grains of heroin. He may also upon an unofficial prescription blank issue a prescription for such quantity of any of such drugs in excess of such respective quantities as may reasonably be required in the treatment of a surgical case or a disease other than drug addiction, provided such fact be stated upon the prescription. Each other prescription shall be written upon a serially numbered official prescription blank to be procured from the department, in triplicate, signed by him and containing in legible English or Latin the name and amount of the drug prescribed, the name and address of the person for whom and the date when the prescription is issued. He shall issue two of such triplicate prescriptions for delivery to an apothecary and shall retain the other triplicate copy on file for a period of two years.

He may while absent from his office in personal attendance upon a patient whom he is treating dispense, to be taken in his absence, not to exceed two grains of cocaine, fifteen grains of opium or three grains of codeine or two grains of morphine or one grain of heroin.

If he otherwise dispense any of said drugs he shall record in writing upon a serially numbered official physician's dispensing blank, to be procured from the department, in duplicate and in legible English or Latin the name and quantity of the drug and the form in which dispensed, the name and address of the person for whom and the date when dispensed and shall sign the same. One of such duplicates shall be kept by him on file for at least two years and the other duplicate he shall, within twenty-four hours, mail to the department.

PHYSICIANS. Each physician shall keep a record of all cocaine or opium or its derivatives purchased or received by him, which shall contain the date of each purchase or receipt, the name and address of each person from whom and the name and quantity of each such drug purchased or received. He shall also keep a record of the gross amount of each of such drugs administered by him to patients, dispensed by him to patients while absent from his office in personal attendance upon them and dispensed by him to patients in quantity not exceeding lawful quantity. He shall also keep a record of each of such drugs otherwise dispensed by him which shall contain the date when, the name and address of each person to whom and the name and amount of each such drug so dispensed. He shall, as required by the commissioner, make and mail to the department a report setting forth such of the information contained in such records as the commissioner may require, together with the amount of each such drug on hand upon the date of such report.

We are informed that the measure has met with the approval of the New York County Medical Society and that it has not been opposed by the legislative committee of the New York State Medical Society. The provisions with which the physicians are expected to comply certainly seem at first glimpse unnecessarily onerous and involved and undoubtedly a vigorous protest will be entered by the majority of the medical profession of the State against the imposition of such detailed regulations.

ANOTHER ASPECT OF ETHICS.

Do we ever stop and wonder if, in all our professional dealings with our brethren, we are doing full justice to that conglomeration of laws, customs, and codes which we call medical ethics? To be sure, we all obey the letter of the law, but how about the spirit? It is not enough to do certain things required by custom and public opinion. One must put his whole soul into their performance.

If a jeweler were to complain that he was unable to get a ring or other trinket for his wife without either paying more than the market value or getting inferior goods, we would regard him as a curious liar. And yet how often the physician is unable to secure the same sort of medical attendance upon his family which he would get if he were a member of some other profession. The experience of a physician known to the writer was thought at first to be unique, until conversations with others elicited parallel instances. This physician's wife visited an ophthalmologist to see if her frequent headaches were referable to her eyes. The specialist greeted her with all suavity, until he learned the vocation of her husband, when his ardor underwent a remarkable cooling. After an examination, which even she could see was perfunctory, he dismissed her with the advice that she get her glasses tight-

ened. The headaches continued, another specialist was visited, with identical results, and then a third. Finally she went to a neighboring city and called on one of its leading eye men, giving a fictitious name and offering somewhat ostentatiously to pay in advance. The result was a thorough examination of the eyes and the discovery of a serious defect which required a very special form of lens.

Another physician is on the staff of a large hospital, lives a short distance outside of a large city, and is not actively engaged in general practice. If one of his children becomes ill and the only physician living in the neighborhood feels inadequate to cope with the trouble, he must perforce send for a practitioner from the city, who arrives twelve to twenty-four hours after the call, makes a hurried examination of the child, perhaps without even removing his overcoat, leaves a prescription, and hurries back, rejoicing that "that is over."

Now it is all very well, in our brotherly love feasts, when we look at one another over the mellowing wine, to speak of our altruism, to say that in no other profession are members so ready to help one another, etc. We may boast, and with some reason, of our sacrifices for our country. But, let us not permit the spirit of service to one another degenerate into a cold, forced compliance with customs. Do not make the doctor with the large family hesitate to call in Doctor Blank who is a bachelor and never ill; do not allude by word or action to the fact that the service is voluntary; in short, give of yourself cheerfully, willingly, and largely, or get into some other calling where business is business and the devil take the hindmost.

DIPHTHERIA AND GRAVIDISM.

Although diphtheria as a complication of pregnancy or the post partum is not common, it nevertheless occurs and it is usually a pharyngeal or laryngeal localization of the specific bacillus that is met with. In these circumstances, the gravity of the diphtheria seems to be increased, the state of pregnancy placing the woman in a condition of lessened vital resistance and, consequently, more sensitive to the toxin. As an aggravating factor, the frequent extension of the morbid process to the larynx and trachea is to be noted.

The outcome of diphtheria during gestation depends essentially on the treatment, but the earlier the antidiphtheritic serum is given the better the prognosis. There is no question but that diphtheria has a nefarious influence on the duration of pregnancy, since statistics of any importance show miscarriage or premature labor

to occur in about thirty-three per cent. of the cases.

Experimental work has confirmed clinical results. The proportion of pregnant rabbits whose gestation is interrupted by the influence of diphtheritic intoxication has been found to be thirty-seven per cent., that is, a trifle above the results in the human being. However, in order to obtain still more exact averages further experiments are necessary.

The expulsion of the product of conception is all the more frequent the more intense the intoxication. It is the toxin itself that is the cause of the interruption of gestation. It produces lesions which resemble those described in acute hemorrhagic endometritis of the decidua met with in certain infectious processes, such as cholera. In all instances there is an extremely severe congestion accompanied by hemorrhages, in every way similar to that met with in the intestine resulting from diphtheritic intoxication.

Whether or not miscarriage takes place, the intoxication continues its work, since the animals die in a short space of time, but it is to be noted that the morbid process does not appear to influence the product of conception *in utero*. An offspring born of a diphtheritic mother to whom no serum has been administered, is not immune to this infection.

The treatment should be prophylactic in the first place. A pregnant woman should naturally be prevented from coming in contact with diphtheritic patients and any children having diphtheria should be isolated. The curative treatment, which consists principally of serotherapy, should be at once resorted to as soon as a positive bacteriologic report has been received, and massive doses of serum are preferable since they have no untoward results on the fetus.

During the post partum, diphtheria nearly always involves the vulva or vulvovaginal opening, but the treatment with antitoxins is the same. Diphtheria occurring in a nurse is a contraindication to lactation, even during convalescence, because it is pretty clearly proved that the milk is toxic, even when an intensive serum treatment has been followed.

THE VALUE OF GUM CHEWING.

One of the sequelæ of this horror bringing war which is upon us will be credited by future generations to our gallant representatives on the fighting line. Whether we should assume the defensive or be prepared to receive grateful acknowledgments from our Allies for the introduction of our great national pastime, gum chewing, remains to be seen. It was

announced some time ago that the arrival of American troops in France was accompanied by large consignments of the sticky delight and a recent newspaper report has it that a chewing gum factory—or is it cuisine?—established in England has been so swamped with orders that it is now from six months to a year behind deliveries. Under the special circumstances of the danger of our boys carrying the virus of gum chewing to their brothers in arms of other nations and customs, it may be well to investigate the habit. We strongly suspect that our British brothers are not kindly disposed to this gustatory habit of ours and we are willing to concede that the visual and auditory effect of an enthusiastic performer on the gum may offend the fastidious nonindulger. We have purposely presented and granted first the most serious objection to the practice in order to clear the air for further discussion.

There can be no doubt that chewing for purposes other than the preparation of food for the digestive system, i. e., for purposes exclusively stimulatory, has been practised from time immemorial. Considering all the means of masticatory stimulation—to-bacco, betel nut, the pacifier, a toothpick, a straw, or chewing gum—which man in all climes and ages and of all races seems to find necessary, the American's chewing gum is perhaps the most harmless. It does not necessitate spitting; it assists to a certain extent in cleaning the teeth after a meal; it promotes the flow of saliva, thus permitting this digestive secretion to reach the food which is often hastily swallowed in the quickly snatched meal that many persons indulge in; and last, but not least, the practice leads to no excesses and cannot be said to cause the formation of a habit in a pathological sense. It has been stated that under some circumstances a patient recovering from a general anesthesia may be allowed to allay the thirst of this condition by chewing gum.

The most important and interesting evidence is the practical universality of the custom. To whatever extent the busy manufacturer may be held responsible for this state of affairs, it seems reasonable to assume that such a custom could not be built up unless there was a real need. Let us mention one field only of its complete and unanimous adoption—sport. The terrific speed to which our American sports are keyed and the intense concentration of the players seem to call into play very muscle group in the body. The more saliva secreted as a result of psychic stimulation, the more the rapid, almost convulsive, contractions of the throat muscles call for. On the theory of counterirritation, to say nothing of increasing still further the flow of saliva, men say that chewing gum steadies

and soothes. If this is the effect in a game, we cannot marvel at a brisk chewing gum trade in the army canteen. Tommy with his tea and its gentle stimulation and its flavor of Blighty may look askance at and be looked at askance by Uncle Sam's nephew with his chicle cud, but we see no reason why the patriotic manufacturer should not follow up this promising market even at the risk of extending the custom over the known globe.

TOO MUCH WASHINGTON.

In the effort to centralize the governmental activities a number of bureaus with their numerous officials and clerks have been brought to Washington who might better have been located at some other point. Mr. Hoover, for instance, with his big staff of food administrators, should have been located in Chicago, for Chicago is the centre of the food industry of the United States. The food administrator must keep in close touch with the food stuff markets and with the men concerned in their management; therefore Chicago was the logical place for the location of his central office. Dr. Garfield would find at Pittsburgh all the men who dominate the fuel situation, and his work as fuel administrator would be facilitated if his offices and his office force were transferred from Washington to Pittsburgh.

In the same way, the recently established central purchasing bureau would find New York a much more desirable location than Washington, for probably ninety-eight per cent. of the manufacturers of the United States have in New York representatives with final authority in the matter of price fixing. Regarding medical, surgical, and hospital supplies, practically every large manufacturer is represented in New York City by an agent who can give the final word on any proposal laid before him. Consequently, New York is the best place for buying these goods. Moreover, this city has unequalled facilities for making shipments abroad, and since a large proportion of the goods purchased must be sent overseas and therefore must eventually pass through this city some time, it is just as well to buy them here at first.

It is to be hoped the authorities at Washington will be able to see the desirability of placing these bureaus where their work can be performed most satisfactorily and with the least effort. There is no hardship to the Government involved in having such executives located outside Washington, for they must act in accordance with general lines of policy, determined in advance. They can, should occasion arise, confer with the central authorities at Washington by telephone, or in person with but little delay, while the transfer of their activities to the natural centres of trade will result in great economy of effort; will keep them in much closer touch with the masses of men with whom they have to deal in the various trades, and help solve the grave problem of housing help in Washington. There are many bureaus and officials who must necessarily be located at the capital, but the officials named, including the central purchasing bureau, could do much better work for the Government outside Washington than they can there.

News Items.

Personal.—Dr. Stephen Smith has resigned from the New York State Board of Charities at the age of ninety-five years. Dr. Lee K. Frankel, third vice-president of the Metropolitan Life Insurance Company, has been appointed to succeed him. Doctor Smith's connection with the board, officially and semiofficially, extends over more than a third of a century.

Fatal Accidents in New York.—Fifty-three persons, twenty-seven of them children, were killed by automobiles in the streets of New York during the month of March, twelve by trolley cars, and five by wagons, compared with twenty-five by automobiles, six by trolley cars, and one by a wagon, during March, 1917. Outside of the city, automobiles caused eight deaths, trolleys one, and wagons two last month.

To Guard Health of Women in Ordnance Department of Army.—A health department in the women's division of the Industrial Section Service of the Ordnance Department of the army has been created to look after the health of women employed in the arsenals and other ordnance plants. The new department will be under Dr. Kristine Mann, director of the health clinic for industrial women in New York and lecturer on hygiene at Smith College.

Osteopaths Endeavor to Extend Their Field of Practice.—A bill has been introduced into the legislature of the State of New York, as Assembly bill No. 1124, Senate bill No. 1049, providing for an amendment to the Public Health Law by removing the limitations now placed upon osteopaths which prevents these practitioners from administering drugs or performing surgery with the use of instruments. Commissioner Amster has requested the city's legal representative to express the Health Department's disapproval of this measure.

American Women Physicians to Establish a Hospital in France.—At a meeting of three hundred women physicians in New York on Saturday, March 30th, Dr. Rosalie Slaughter Morton, chairman of the organization of American Women's Hospitals, announced that her organization had concluded an arrangement with Miss Anne Morgan, of the American Committee for Devastated France, and the League for Political Education, whereby funds were to be gathered and to be divided equally between the hospitals and Miss Morgan's committee. About \$50,000 is to be set aside immediately for the establishment of a hospital in the Aisne region to be managed entirely by women surgeons.

Industrial Disease Clinics.—The following resolutions regarding industrial disease clinics were adopted recently by the Associated Out Patient Clinics:

WHEREAS, There exists a great deal of occupational disease, and **WHEREAS,** Cases of occupational disease are oftentimes not properly diagnosed in the out patient clinics, and

WHEREAS, It is the duty of the clinics to help in providing the sick with competent medical advice, therefore be it

Resolved, That in the interest of the sick and the industrial efficiency of the workers, the attention of the boards of trustees of dispensaries situated in the industrial sections of the city be called to the need of the early recognition of occupational disease, and that in order to facilitate the work of the physicians in this task detailed records should be taken as to the occupation of all patients; that adequate facilities be provided for the treatment of occupational diseases and industrial poisonings; and that an interest in the study of occupational diseases should be stimulated among the physicians connected with the dispensaries.

Openings for Surgeons in the Regular Army.—The Surgeon General of the United States Army announces that there are approximately six hundred and fifty vacancies in the Medical Corps of the Regular Army, and that examinations to fill these vacancies are being held at various places throughout the United States on the first Monday of each month. The Surgeon General is very desirous of filling these vacancies as promptly as possible and invites applications from graduates of medical colleges, between the ages of twenty-two and thirty-two years, who have had at least one year's postgraduate hospital experience. The successful applicants will be given the rank of first lieutenant at a salary of \$2,000 annually and with an allowance for quarters except when in camp. Full particulars regarding the duties, and emoluments of officers and opportunities in the service will be furnished on application to the office of the Surgeon General of the United States Army, Washington, D. C.

A New Narcotic Law Proposed.—A bill has been introduced into the legislature of the State of New York, as Senate bill No. 951, by the narcotic drug committee of the legislature, and referred to the committee on public health. The act was drawn up by this committee as a result of numerous hearings within the past two years. It provides for the creation of a drug commission which shall be charged with the enforcement of the law. The regulations included in the bill are quite elaborate. Those portions which deal with the physician specifically are set forth in the editorial columns.

The American Red Cross in Great Britain.—Following the announcement that the War Council of the American Red Cross had appropriated \$1,250,000 for the continuance of its work in British hospitals and for British relief work, initial steps have been taken for the construction of rest camps and hospitals for American troops passing through British territory. In accordance with a request from William Endicott, of the commission for Great Britain, \$47,725 has been appropriated by the Red Cross War Council for the erection of the new rest camps and hospitals, which will be similar to those erected on the lines of communication in France. The War Council also has provided for the expansion of the Liverpool Hospital of the American Red Cross.

Civil Service Examination for Pathologic Physiologist.—The United States Civil Service Commission announces an open competitive examination for a pathologic physiologist, open to men only. A vacancy in the Hygienic Laboratory, Public Health Service, Washington, D. C., at \$3,000 a year, and future vacancies requiring similar qualifications at this or higher or lower salaries will be filled from this examination. The duties of the appointee will be to study the pathology of industrial poisoning, with special reference to the manufacture of munitions. A degree of M. D. from an institution of recognized standing, and at least two years' post graduate experience in pathologic physiology, are prerequisites for consideration for this position. For full particulars and the proper application blanks address the Civil Service Commission, Washington, D. C. All applications must be properly executed and filed with the commission on or before May 7th.

Hospitals for Reconstruction of Disabled Soldiers.—Surgeon General Gorgas has announced that the following fourteen hospitals will be used in beginning the work mapped out by the Army for the reconstruction of disabled soldiers when brought back from France: General Hospital No. 2, Fort McHenry, Maryland; General Hospital No. 3, Colonia, New Jersey; General Hospital No. 4, Fort Porter, New York; General Hospital No. 6, Fort McPherson, Georgia; General Hospital No. 7, Roland Park, Baltimore, Md.; General Hospital No. 9, Lakewood, N. J.; General Hospital No. 13, Dansville, N. Y.; General Hospital No. 14, Fort Oglethorpe, Georgia; Army and Navy General Hospital, Hot Springs, Ark.; Walter Reed General Hospital, Takoma Park, Washington, D. C.; Letterman General Hospital, San Francisco, Cal.; Base Hospital, Fort Des Moines, Ia.; Base Hospital, Fort Riley, Kan.; Base Hospital, Fort Sam Houston, Texas. From time to time other hospitals for reconstruction work will be added.

Meetings of Medical Societies to Be Held in New York during the Coming Week.—Monday, April 8th, New York Ophthalmological Society, Society of Medical Jurisprudence, Yorkville Medical Society, Association of Alumni of St. Mary's Hospital, Brooklyn, Williamsburg Medical Society, Brooklyn; Tuesday, April 9th, New York Academy of Medicine (Section in Neurology and Psychiatry), New York Obstetrical Society, Manhattan Dermatological Society; Wednesday, April 10th, New York Pathological Society, New York Surgical Society, Medical Society of the Borough of the Bronx, Brooklyn Medical Association, Alumni Association of the Norwegian Hospital, Brooklyn; Thursday, April 11th, New York Academy of Medicine (Section in Pediatrics), West Side Clinical Society, Brooklyn Pathological Society; Friday, April 12th, New York Academy of Medicine (Section in Otolaryngology), Society of Externs of the German Hospital in Brooklyn, Flatbush Medical Society, Eastern Medical Society of the City of New York, Clinical Society of the German Hospital and Dispensary, Manhattan Medical Society; Saturday, April 13th, Association of the Medical Officers' Reserve Corps, U. S. Army, New York Division.

Modern Treatment and Preventive Medicine

A Compendium of Therapeutics and Prophylaxis, Original and Adapted

THE TREATMENT OF HEMOPHILIA.

By LOUIS T. DE M. SAJOUS, B. S., M. D.,
Philadelphia.

(Continued from page 612.)

The utility of calcium medication in hemophilia, according to recent clinical observation and laboratory tests, seems restricted to a small number of exceptional cases in which there exists a definite lack of calcium in the blood. In the case reported by Max Kahn, 1916, of a boy of six with a tendency to bleed from minor cuts and to manifest frequent black and blue marks and severe epistaxis, the deficiency of calcium was clearly shown, the patient's blood yielding only 0.047 gram of calcium oxide per 1,000 mls of blood as compared to an average of 0.070 gram in a series of twelve normal controls and 0.068 gram in a typical case of hereditary hemophilia. Metabolic studies in the former case showed that, whereas the metabolism of nitrogen, sulphur, phosphorus, chlorine, and magnesium was normal, the output of calcium with the feces and urine considerably exceeded the amount taken in with the food, the result being thus a "negative calcium balance." In the case of typical hemophilia, on the other hand, calcium showed a positive balance. Again, in the case of hemophilia calcipriva, the clotting time of the blood was found to be thirty-four minutes. Upon adding to this blood *in vitro* enough calcium chloride to make up approximately the known deficiency in calcium, the clotting time was shortened to seventeen minutes; upon adding twice this amount, to thirteen minutes, but upon adding three or four times the amount only to twenty-six minutes. In the case of typical hemophilia the clotting time, originally eighteen minutes, was always lengthened upon adding extra calcium; the same tendency was also clearly manifested with normal blood. Upon feeding the calcipriva case two grams of calcium chloride daily for three days, the negative calcium balance of 0.82 was changed temporarily to a positive calcium balance of 0.63. Feeding calcium lactate, two grams for three successive days, was found by actual quantitative test to increase the blood calcium oxide per 1,000 mls from 0.47 to 0.64. Finally, the relationship of calcium deficiency to the hemophilia in this case was apparently confirmed by the clinical results of calcium medication. Hess, 1916, referring to this same case, notes that after calcium lactate had been administered for several weeks the clotting time was reduced to seven minutes and the patient had not bled for some time.

The case just referred to was not that of a hereditary bleeder but a sporadic instance of hemophilia of a special, atypical variety. While in this case calcium treatment was beneficial, facts recently noted in relation to the typical hereditary hemophiliacs have shown that, in these, calcium may not only not be productive of good, but actually prove prejudicial. Clinical observers have been aware for some

time that if calcium is used to excess, the coagulation time in hemophilia may be prolonged by it. Thus, Labbé, 1908, noticed an effect opposite to that expected when the calcium salts were given for too long a period; he also stated his belief that calcium was not curative in hemophilia.

In the clinical laboratory these observations were confirmed by Kahn's tests with hemophilic blood, already in part described. Whereas, in a case of typical hemophilia, the blood clotted in eighteen minutes, when an excess of calcium was added clotting was not complete even at thirty minutes. Again, when to normal blood clotting in six minutes, any considerable excess of calcium was added the clotting time was prolonged to fifteen minutes or longer. Laws and Cowie, 1916, in the case of a hereditary bleeder with a coagulation time of two and a half hours found, upon administering twenty-one grams of calcium lactate in three days, that while the calcium content of the blood—previously normal—was increased to about fifteen per cent. above normal, the coagulation time was lengthened to nearly five hours as a result of the calcium administration.

Such findings as these, in view of the great preponderance of cases in which calcium is not deficient, show rather plainly the wisdom of not using the calcium salts too freely and indiscriminately in hemophilia. The best procedure would manifestly be, if possible, to test the blood in the individual case for calcium deficiency in the manner described by Kahn, two drops of a 0.011 per cent. solution of calcium chloride in normal saline solution being added to ten drops of blood and the effect on the coagulation time observed. On this basis calcium treatment could, it would seem, be conducted in a rational fashion. Since, however, performance of such tests would not always be practicable, and since most cases apparently do not require calcium, the practitioner may deem it wise simply to use calcium in a tentative manner in all cases. Under these conditions it would seem advisable to avoid doses which, in cases not needing calcium, would act unfavorably in prolonging the coagulation time. In Kahn's case of hemophilia calcipriva in a boy of six, two grams of calcium chloride daily seemed amply sufficient to change a negative to a positive calcium balance and to improve the patient's condition. In Laws and Cowie's case of typical hemophilia in a boy of nine, ingestion of nine grams of calcium a day was apparently required for a significant increase in the blood calcium and coagulation, even though the calcium balance before ingestion of the salt seemed strongly positive. Calcium chloride contains about thirty-six per cent. of pure calcium and the lactate only about thirteen per cent. On the whole, therefore, two grams of the chloride or six grams of the lactate a day may probably be considered safe dosage for children six to ten years of age. Much more than this would probably expose the typical hemophilia cases to a further impairment in coagulability, while in the calcipriva cases even

less than the doses mentioned would probably yield the desired therapeutic results.

Strontium, which belongs to the same chemical group as calcium, has been shown to possess the same property of accelerating blood coagulation, though according to Howell, 1914, it is much weaker in this respect than calcium. E. W. Scott, 1912, reports that in a case of hemophilia in which strontium lactate was employed in one gram doses, coagulation occurred in one third the time previously noted, within one hour after its administration. This effect was transitory, but the patient in question is stated to have carried the drug constantly with him and thus succeeded in arresting hemorrhage in less than twelve hours whereas before it had continued several days. Presumably strontium salts would prove of service only in cases in which calcium itself is deficient in the bloodstream.

(To be continued.)

Preventive Treatment of Wound Shock.—W. B. Cannon, John Fraser, and E. M. Cowell (*Journal A. M. A.*, March 2, 1918) point out that the study of wound shock indicates that everything should be done in the way of treatment which will promote the restoration of a normal and stable flow of blood and all factors which interfere with this restoration must be eliminated. Prompt control of hemorrhage, reduction of sepsis by proper dressings, and the control of pain by morphine and careful transport are commonly practiced, but to these other measures can be added with much improvement. The wounded man should be guarded against loss of heat from the very first. First aid dressings should be applied with as little exposure as possible, a hot drink should be given at once, and the patient should be carefully wrapped in a blanket, which should be carried, dry, along with every stretcher, and a dose of sixteen milligrams (grain one fourth) of morphine might be given orally by the orderly if there is much pain. The patient should then be carried rapidly to the regimental aid post where his general condition should first be attended to, to be followed by attention to his wound. He should be transferred to a stretcher provided with three blankets, so folded as to give four thicknesses of blanket both above and below the patient. A few ounces of hot fluid should be given as soon as the patient arrives, his wet boots and puttees should be removed, with other clothing if it covers wounds. During this time he should be lying on the dry stretcher, one of the blankets of which is allowed to fall downward on either side to form a warm chamber with the help of a stove placed under the stretcher. When the wounds are properly cleansed, dressed and splinted a second hot drink is given, preferably of sweetened tea containing four grams of sodium bicarbonate, and hot water bottles are placed about the patient. At the advanced dressing station he is again warmed without being moved from the stretcher and any necessary treatment is carried out. Fresh hot water bottles are provided and he is removed to the clearing station where warmth is again applied while he is being undressed and prepared for operation. The provision of hot tea containing sodium bicarbonate, to be given at

various suitable points along the patient's course of transit from the front to the clearing station, goes far toward preventing the further increase of acidosis which is likely to follow surgical operation in shocked cases. When all is ready for operation intravenous infusion of warm sodium bicarbonate solution should be started, the four per cent. solution being given at about thirty mils per minute. By following out all these simple details a great deal can be done in the prevention of serious or fatal wound shock, as proved by the results of actual practice.

Bouchon's Method of Wound Treatment.—Lestrade (*Presse médicale*, January 7, 1918) lays stress on the advantages of Bouchon's procedure in certain severe wounds. Thus, one case had an extensive shell wound of the left wrist, with section of the flexor tendons, the median nerve, the ulnar artery, the flexor thumb tendon, and the muscles of the thenar eminence; also fractures of the trapezium and trapezoid bones and exposure of the second series of carpal bones. No tissues were excised, but the wound "fixed" by a solution of formaldehyde, followed by irrigation with Javel's solution. Within ten or twelve days, granulations appeared, and in a month and twelve days after the injury the wound was three fourths healed and covered with epidermis. The second case had a large shell wound of the outer aspect of the right calf, with section of the tibial artery and the musculocutaneous nerve. Most of the muscle tissue of the part was torn to bits. Contused tissues were excised, but next day local gangrene appeared and formaldehyde solution, followed by Javel's solution, was used. Three months later the wound was completely filled up and for the most part covered with epidermis. The Bouchon method, rapid, simple, and certain, is particularly indicated in greatly shocked patients who could not withstand a long operation under anesthesia. It may also be used in wounds that are difficult to reach and expose. In cases such as those described, it greatly facilitates conservation of an injured extremity.

Wounds of the Chest.—W. A. Rees and Gerald S. Hughes (*Lancet*, January 12, 1918) call attention to a number of important facts in relation to the treatment of such wounds, derived from an extensive experience at an advanced operating centre. In the first place, severe hemorrhage never arises from the intercostal arteries, and the practice of plugging the opening is of no value in controlling the bleeding, and may be of material harm in preventing free ingress of air and the collapse of the lung, which is Nature's method of promptly controlling the bleeding. The plugging is also a frequent means of transferring infection to the interior of the chest. While a large proportion of all penetrating or perforating chest wounds are probably accompanied by the introduction of infection through the missile and the clothing, in the majority of cases the pleura can care for this infection provided further infection is prevented. In closed wounds with hemothorax or pneumothorax the treatment should be the same as for an ordinary hemothorax, but the patient should be watched closely and his chest fluid should be examined every

few days, a syringe being removed under aseptic precautions. If infection develops, the chest should be freely opened at once and drained. In some cases it is advisable to aspirate some of the blood if this is large in amount. In the cases with open, or leaking, hemothorax the aim should be to convert the condition into a closed hemothorax as soon as hemorrhage from the lung has stopped. For this purpose the most satisfactory method is to clean up and excise the wound margins and bring them together by strong sutures, the last being tied at the end of expiration. This must be done as soon after the receipt of the wound as possible, for every hour of delay increases the danger of secondary infection and all cases remaining open for more than forty-eight hours become infected. The foreign body, if in the lung, should be removed in exceptional cases only, the least surgery possible being practised in the early stages if life is to be saved.

A Note on the Progress of Cicatrization of War Wounds.—Theodore Tuffier and R. Desmarres (*The Journal of Experimental Medicine*, February, 1918) discuss some hypothetical conclusions bearing on the evolution of cicatricial tissue. The arterial circulation deposits in the wound chemical substances necessary for contraction of the wound and for epithelial proliferation. When there is no intervention of a severe or special bacterial infection this deposit is as regular as the circulation itself, and enables one to calculate the date of cicatrization. Even when an infection does take place, the substances seem to be stored up in the wound, so that the authors observed when epidermization has been wholly or partially arrested by an infection after this has disappeared, the progress of new epidermization is much more rapid than is normal, and will even pass the calculated curve. The existence of the physical or chemical activating agents is indicated by two anatomical clinical facts. In the case of a scalp wound which had been treated for months and showed practically no epidermization, dermo-epidermic grafts of fetal skin were applied over the entire surface of the sterile wound. After apparently taking, the grafts were absorbed and disappeared, but the periphery of the wound began to show epidermization, where it had hitherto not progressed, in abundance, almost 100 times as much as before. Tuffier and Desmarres believe that the problem of the action of various organic fluids on the cicatrization of wounds may be solved by mathematical measurements.

Primary and Secondary Suture in War Wounds.—G. Potherat (*Presse médicale*, December 20, 1917) reports 221 primary and 459 secondary sutures among 1,005 wound cases. Among the primary suture cases there were two complete failures and eleven partial failures, the former due to insufficient operative removal of tissue, bits of uniform being found later in the wounds. The partial failures were due to hematomas resulting from imperfect hemostasis. The author never resorts to primary suture in extensive linear or sinusoidal wounds, in extensive bone destruction, nor after delay exceeding twelve hours. Where primary suturing is thus impracticable, he attempts to carry out a secondary suture. After careful removal of

dead tissues, the wounds are treated by continuous or intermittent irrigation or with a simple wet dressing of 12.5 per cent. magnesium chloride and 0.125 per cent. ammonium chloride solution. This cytophylactic solution he prefers to Dakin's fluid, which at times burns the tissues and may even cause sloughing. Complete arrest of suppuration and descent of the temperature are generally procured in two or three days, or at the longest in eight or ten. The wound is then well cleansed, even by rubbing, with one or two litres of tepid magnesium chloride solution, and the secondary closure effected, either with sutures or, if the wound margins can be brought together readily, with adhesive strips. Results were even more rapid where heliotherapy was practicable in addition to the magnesium chloride treatment.

Digitalis and the Control of Auricular Fibrillation and Auricular Flutter.—Robert H. Halsey (*American Journal of the Medical Sciences*, March, 1918) concludes that the gross irregularity of the ventricle in cases of fibrillation of the auricle can be controlled by digitalis if sufficient drug is exhibited. The patient should be instructed to continue the use of digitalis for the remainder of life, and should be taught how to determine the amount of the dose necessary from day to day to control the heart rate. Give sufficient drug to maintain the rate of the ventricle below seventy per minute when counted after a rest in the late afternoon. The fibrillating auricle under a short course of digitalis may return to normal rhythm. In auricular flutter the aim of treatment with digitalis is to produce auricular fibrillation and then to control the rate of the ventricle with digitalis, hoping in the favorable cases for a renewal of normal sequential rhythm.

Transplantation of the Trachea.—Walter C. Burkett (*Bulletin of the Johns Hopkins Hospital*, February, 1918) after a review of the rather extensive literature on the subject, reports experiments made on ten dogs. A preliminary study was made to determine the sterility of the trachea of the cat at different levels. Approximately sixty cultures were made which, in nearly all cases, showed that the trachea was sterile from the larynx to the hilus of the lung. The main problem, the auto- and is transplantation of complete annular segments of the trachea in dogs, was then attacked. The operative technic is given in detail. Of the ten animals used, three were successful auto-transplant cases, apparently as healthy and well as before the operation. At autopsy, sixty-two, fifty-four, and thirty-six days after operation respectively, the trachea was normally mobile, without adhesions, and gross examination showed no reaction in the tissues about the site of the transplant. In these cases the segment transplanted was composed of three, four, and seven cartilaginous rings. Microscopical examination showed the epithelium intact; there was no infiltration of lime salts, and the healing had taken place by the normal layers of the tracheal wall, and not by fibrous cicatrix. In the unsuccessful cases, bacilli and numerous cocci were seen, and perhaps the strictures observed were the result of infection. The two isotracheal transplants resulted in stenosis.

Appendicitis and the General Practitioner.—

Moses Behrend (*Western Medical Times*, February) maintains that too many cases of appendicitis die on account of procrastination on the part of the physician, and that the number of pus cases met with by the surgeon is much too large because of the treatment adopted before he is called. A virile source of complications is the administration of morphine, which should never be given. Next to morphine come purgatives in the production of bad effects, because we are unable to judge the exact stage of the disease. Sometimes patients defecate into the peritoneal cavity after the use of purgatives. Enemas are in order, but even these are not altogether harmless. He urges the radical policy of operating on every case immediately. The harm done by operating on cases with acute abdominal pain not appendicitis does not compare with that caused by delay when appendicitis is present, because of the complications that may arise in the latter, even though the patient survives the attack, such as ileus, abscesses in the pelvic and renal regions, septic pneumonia, and the formation of extensive adhesions. The three cardinal signs, pain, nausea or vomiting, and rigidity of the right rectus muscle, are sufficient to make the diagnosis readily, though the concomitant miscellaneous symptoms, such as the relation of the temperature to the pulse, the leucocyte and differential counts, should be taken into consideration.

Treatment of Gastric Ulcer by Gastropylorectomy.—

Victor Pauchet (*Bulletin de l'Académie de médecine*, December 18, 1917) notes that most dyspeptic troubles originate in the absence of any gastric lesion, the condition being generally a reflex dyspepsia due to disease of the gallbladder, an intestinal kink or growth, appendicitis, gastrocolopositis, or even an extraabdominal disorder—lung tuberculosis, tabes, cardiac or renal insufficiency, acetonemia, etc. One of truly gastric origin, chronic or recurrent, can nearly always be described as a duodenal or gastric ulcer. Most of such cases upon which the author has operated have a long history, and their attenuated manifestations only distantly resemble the classical symptom-complex. They had previously been diagnosed as Reichmann's disease, hyperchlorhydria, nervous dyspepsia, etc. Acute recent ulcer can frequently be cured by rest, dieting, and bismuth. Gastroenterostomy is a satisfactory operation in duodenal ulcer, especially if supplemented by Enriquez's sphincterectomy, which eliminates pylorospasm and establishes pyloric exclusion. In gastric ulcer, however, especially in ulcer of the lesser curvature, at a greater or less distance from the pylorus, the author performed for one year simple excision of the ulcer, followed by suture. The therapeutic results were better than those of gastroenterostomy, but there was a mortality of twenty per cent. For the last eight years he has been resecting, along with the ulcer, the pylorus and a variable additional mass of tissue. Such an operation alone gives complete and lasting results. Among 217 gastrectomies the mortality was nearly ten per cent., but in some of these cases there had been grave hemorrhage, suppurative perigastritis, or involvement of the liver or pancreas. Stress is laid

on examination of the entire posterior surface of the stomach at operation. The portion of tissue to be removed is denuded with a compress, and no ligatures or hemostats are used. After the resection a posterior gastroenterostomy is added. Where neighboring organs have been eaten into by the ulcer the resulting cavity is painted with iodine. In very weak patients, with the lesion near the pylorus, the operation is done in two stages—first a gastroenterostomy, and, three or four weeks later, the secondary gastrectomy. In spite of postoperative recovery of perfect digestive functions, the patient must continue to observe a careful dietary, to protect the liver, kidneys, and the insufficiently functioning glands which originally favored the production of the ulcer.

Drainage of the Bodies of the Vertebrae.—

Leo Mayer (*Journal A. M. A.*, March 2, 1918) suggests the following method of approach for drainage of the vertebral bodies: A longitudinal incision six inches long is made to the left of the midline and at the outer border of the ileocostalis muscle a second parallel incision. These two are joined at their centres by a horizontal incision, and the skin flaps are dissected upward and downward to expose the muscle mass. A hemostatic suture is passed, beginning at the upper, outer angle, passing down to the lower, then across and up, and a muscle flap is outlined with its base upward and corresponding in size and shape to this suture. This flap is retracted upward, exposing the laminae, transverse processes and middle layer of the lumbar fascia. The transverse process, or processes, is resected at its base and the psoas muscle is freed from the body of the vertebra by the finger. Then the body is opened by a suitable instrument, curetted, a drain inserted and brought out of the outer skin incision, after which the flaps are replaced and sutured.

The Value and Limitations of Sanatorium Treatment for Tuberculosis.—

St. Clair Thomson (*Practitioner*, February 1918) says the value of the sanatorium for suitable cases is established, and cannot be replaced by other measures. It is useless to impeach sanatoria for insufficient or unsatisfactory results when after care is of equal, if not greater, importance. The campaign against tuberculosis has many fronts. Sanatoria alone are not going to banish consumption. A few months in a sanatorium, without adequate after care, are not going to put a consumptive working man back in his factory to do a full day's work. As a rule none but quite early cases of tuberculosis can be lastingly cured in a sanatorium. The provision for after care is an urgent, complicated and difficult problem. Large, comprehensive measures need to be devised through which the arrest secured by sanatorium treatment can be consolidated, and before he returns to it, the conditions of the patient's bad environment must be removed by improved dwellings, factories, and workshops. The public can be prepared for this by a more thorough education. With town planning and house construction we may have solid, dry, well warmed and well ventilated dwellings and workrooms, with domestic training we may obtain properly cooked and selected food.

Technic of Therapeutic Intratracheal Injections without Illumination.—M. Mignon (*Presse médicale*, January 10, 1918) describes a simplified method of intratracheal injection intended to assist the general practitioner in direct medication of the diseased trachea. The larynx is rendered more accessible by simultaneous traction on the tongue and elevation of the epiglottis with a finger introduced through the mouth. Local anesthesia is unnecessary unless there is hyperesthesia or painful lesions exist, when a little ten per cent. cocaine solution with adrenalin may be applied to the base of the tongue and laryngeal vestibule. The tongue is held out as far as possible by the patient himself or an assistant. The left index finger of the physician lifts the epiglottis, while the right hand introduces along the finger a syringe with long curved nozzle. The latter is passed in along the epiglottis in the midline, then between the cords as the patient takes a deep inspiration. The medicated fluid is now gently discharged into the trachea. Where a special intratracheal syringe is not available, a suitably curved metallic catheter, connected with a funnel or ordinary syringe by means of rubber tubing, may be used. As injection fluid the author employs generally a one in twenty or thirty solution of gomenol in olive oil. Sometimes a solution of eucalyptol is used, occasionally alkaline solutions in special burns of the air passages or anesthetic solutions where there is sharp tracheal pain.

The Treatment of Delirium Tremens by Spinal Puncture, Stimulation, and the Use of Alkali Agents.—Herman H. Hoppe (*Journal of Nervous and Mental Disease*, February, 1918) gives the following as the routine treatment for delirium tremens: 1. Catharsis by means of calomel followed by a rather large dose of Epsom salts. The latter is especially indicated because of the well known effect of sulphate of magnesium in dehydrating the tissues of the body. 2. Ten drops of tincture of digitalis and of nux vomica are given by the mouth every three hours. In the active stage of delirium strychnine and digitaline are given hypodermically. This stimulation the writer believes to be perhaps the most essential part of the treatment. 3. In mild cases the indication for alkalies is met by the use of the imperial drink with lemon juice. Prolonged hot baths and hot packs are given twice a day, chloral and bromides are given only at night, and then not more than two or three doses during the twelve hours. In ordinary mild cases, uncomplicated with kidney trouble, the treatment outlined above is sufficient. In more severe cases spinal puncture is resorted to as soon as the patient begins to have hallucinations. The cerebrospinal fluid is always under pressure and from 30 to 60 c. c. is usually withdrawn. This procedure is followed by a rapid reduction of the delirium, especially in cases which have had preliminary stimulation and alkalization. If the delirium returns, spinal puncture is repeated, and the fluid is usually found to be again under pressure. If the delirium still continues in spite of the spinal puncture, or if the patient is pale and covered with perspiration with a low, muttering delirium, an intravenous injection of normal saline solution is given, or better, Fisher's solution.

Separate Suture of Nerves in Nerve Trunks.—J. N. Langley (*British Medical Journal*, January 12, 1918) points out that the nerve trunks are made up of separate bundles of fibres, each of which has its own special distribution and function. These separate nerves change their relative positions within the trunk in the course of the nerve trunk, and some of them have only short isolated courses before they break up to form intraneural plexuses. When nerves are sutured after injury or severance it is exceedingly improbable that the individual nerve bundles are brought into apposition, so that when regeneration occurs nerve fibrils of one type will grow into the ends of another type of nerve and the resulting "nerve pattern" will be much disordered. This necessitates considerable time for re-education, and the finer movements and sensations are never perfectly restored. It is suggested that efforts be made, therefore, where possible to identify the individual nerves in a severed trunk, specially in the case of the sciatic and possibly also in the musculospiral, and suture the corresponding nerves directly. Such a plan is not beyond the bounds of accomplishment.

Points in the Treatment of Dysentery.—Duncan Graham (*Lancet*, January 12, 1918) brings out some valuable points in the treatment of bacillary dysentery as the result of wide experience in the British Salonika forces. In acute and severe cases all patients are given fifteen mls (one half oz.) of castor oil on admission and, beginning eight hours later, receive eight grams (drams ii) of sodium or magnesium sulphate, which is repeated every four hours as long as the mucous stage lasts. When the mucus disappears the saline is given in just sufficient amount to secure a soft movement. Intestinal lavage with solutions of eusol, potassium permanganate, protargol, or normal saline are given night and morning if the patient is relieved by their use. Opium enemata and astringents by mouth are irrational. Antidysenteric serum should be begun at once and given intravenously. To avoid the severe primary reactions which occasionally occur two mls should be injected at once and the remainder slowly run in after an interval of ten minutes. Larger doses than usually prescribed should be used, ranging from sixty to eighty mls, and should be given twice daily. In most of the very toxic acute cases the greatest danger seems to come from dehydration of the tissues and this can be largely overcome by the use of intravenous injections of 150 to 300 mls of normal saline immediately following each dose of serum, or of five per cent. solutions of glucose in distilled water. In the chronic, mild, and mild recurrent cases, dehydration is not a factor, and these injections are not necessary. One of the most important features in treatment of all forms is the proper regulation of diet, not only during the acute stage, but also when the patient is convalescent. In the beginning it should consist of albumen water, gruels, and tea sweetened with lactose. During recovery the diet should be slowly changed to contain arrowroot, Benger's food, malted milk, sour milk, and diluted fresh milk; along with the use of lactose in the foods. Progress to full diet should be made very slowly.

Miscellany from Home and Foreign Journals

Tabes Dorsalis.—Morris Grossman (*Journal of Nervous and Mental Disease*, February, 1918) has made a statistical study of 240 cases of tabes with regard to the incidence of syphilis, the age of infection, the age of onset, the influence of treatment of the primary infection, the pre-tabetic stage, preataxic stage, ataxic stage, chair and bedridden stage, and death in this disease. He finds the average age of syphilitic infection to be 24.4 years, the average age of onset of tabes in 238 cases to be thirty-nine years. No detectable difference exists in the age of onset of tabes in those patients treated with antisiphilic remedies, and in those not treated, or presumably less treated. The average pre-tabetic interval is not greater than 14.6 years. The pre-tabetic interval in the young may, but seldom does, last for a shorter period than in the more mature. The resistance of the central nervous system seems to deteriorate with age. The duration of the pre-ataxic period may be influenced by age; its probable average length is three years, and seems to be shorter in women than in men. The average life expectancy of the bedridden tabetic is very much longer than is usually taught, being fifty-three years. Most tabetics usually perpetuate the ataxic stage; in the small percentage of cases which become bedridden, owing to uncomplicated ataxia, the average duration of the ataxic period is 4.11 years. Among tabetics who become bedridden a short ataxic period usually follows a short preataxic period; the short ataxic period in these cases is due to the same mental inferiority as is conducive to the short preataxic stage. The cause of death in tabes is syphilis. Syphilis and tabes lead to death through cardiovascular and renal degeneration, and through weakened resistance to nonsyphilitic infections. The average age at which death occurs is fifty-three years, the mortality among tabetics over fifty-three years of age being 238 per 1,000. Tabes is as nonlethal as any form of syphilis.

Neurasthenia Pura.—S. H. Bennett (*Practitioner*, February 1918) says there is practically always in true neurasthenia a long prodromal period, the pre-neurasthenic state, characterized by well-defined morbid manifestations indicative of aberrant functioning of the emotional centres. The immediate cause of this instability is the reaction of environment on the patient's mind. This state is not actual neurasthenia, and may not develop into it, but neurasthenia is its culminating development. Neurasthenia is a definite syndrome which must not be confounded with the nervous asthenia of many neurasthenoid states that constitute the prodromal periods of various psychoses, result from the abuse of stimulants, drugs, or tobacco, or are symptomatic of organic diseases. Theories of auto-intoxication, toxæmia, etc., are unsupported by evidence as explanations of its origin. It is characterized pathologically probably by a chronic cerebral anaemia, while the emotional and vasomotor instability permit the ready occurrence of cerebral hyperaemias followed by cerebral anaemias, so that the nerve cells in the brain probably are the victims of a dimin-

ished or perverted metabolism. The varying and multitudinous symptoms of neurasthenia are the expression of aberrant functioning of the emotional centres, and of the vasomotor, sympathetic, sensory, and motor systems of nerves, and many of them are to be regarded as what might be termed vicious circle manifestations. Although some of the symptomatology is the product of an unconscious auto-suggestion, the disease is by no means an imaginary one, many of the symptoms being either painful, or intensely distressing and alarming. Hence neurasthenia is to be clearly differentiated from obsessions, hysteria, melancholia, and hypochondriasis. The heart and the blood vessels are usually the first to reflect the central functional disturbance in neurasthenia. Bennett claims that a whole series of needless and useless nomenclature can be dispensed with by basing its classification upon differences in the clinical picture alone, when only two varieties need to be recognized:—cerebrospinal neurasthenia, with its subdivisions cerebrasthenia and myelasthenia, and cardiac neurasthenia. The subject is well presented in a paper of considerable length.

The Nature of Wound Shock.—W. B. Cannon (*Jour. A. M. A.*, March 2, 1918) enters into an extended discussion of the nature of wound shock in the light of the most recent animal experiments and the extensive researches which have been conducted on soldiers in and at various points behind the firing line. The acapnia theory seems to merit dismissal from consideration at once as it is not supported by the observed facts. The nerve exhaustion theory is almost in the same category (although some degree of exhaustion of the vasomotor and other vital centres does seem to be the ultimate result in some cases of prolonged shock. Suprarenal exhaustion also does not occur as the cause of shock, and the heart is not the primary cause of it. The three outstanding features are, loss of blood from the circulation, occurrence of blood concentration and increased viscosity in the capillary area, and the presence of acidosis. The loss of blood from the circulation, in the absence of actual hemorrhage, seems to be due to its accumulation in the capillary and tissue spaces. This seems to cause part of the increased viscosity of the blood in that location, but the presence of acidosis also plays a part in this phenomenon of increased viscosity. On the other hand, the reduction in the amount of blood in the general circulation diminishes the oxidative processes and favors the further development of acidosis. There is also an increase in the size of the individual corpuscles, which further promotes stasis. The fall in blood pressure due to the blood stasis tends to favor the further development of stasis, and, this increased, further reduces the effective blood pressure. These are but some of the vicious circles encountered in shock. The condition seems primarily to be one of "Exemia" or loss of blood from the circulation. The mechanism of the production of shock seems to differ according to whether the condition is primary or secondary. Primary shock seems to be favored by an unstable nervous system, great excitement

fear, pain from a relatively minor injury, and, most of all, by conditions of life which include an insufficient supply of drinking fluids, physical exhaustion, and exposure to cold and wet. The latter largely aid in the initiation of capillary stasis, which is perhaps started by the initial fear or pain and promoted by the rapid loss of fluid by profuse sweating. In such cases prompt treatment by relief of pain and fear, application of warmth to the body and the administration of an abundance of fluids usually results in prompt recovery. Secondary shock seems to be produced by a wound causing an instability of the circulation, to which are later added the factors of exposure, hemorrhage, and toxemia. The resulting condition is the same in kind as that in primary shock, but far greater in severity. In the latter, also, the progress is slower and more continued, with the added development of an increasing degree of acidosis which adds its quota to the causative factors.

Blood Pressure in Wound Conditions.—John Fraser and E. M. Cowell (*Jour. A. M. A.*, Feb. 23, 1918) record their results in an extensive series of blood pressure observations made on normal and wounded men in the trenches and at advanced dressing stations. The average systolic pressure for healthy soldiers lay between 110 and 120 mm., the diastolic between 70 and 80, and the pulse pressure at about 40 mm. mercury. The systolic blood pressure was usually found to be somewhat higher than this when the men were in the front line trenches, but it fell to the average promptly after rest away from the line. In wounds seen in the firing line the systolic blood pressure showed two distinct types; the one high, from 150 to 170 mm., the other low, from 40 to 90 mm. and associated with primary shock. The pressures of the first type fell to normal and remained there after short rest and if the recovery of the patient was normal. Those of the second group might become partially restored after rest, warmth, and appropriate treatment, but when there was hemorrhage the pressures continued to fall and secondary shock developed. Simple scalp wounds showed a slightly elevated systolic pressure; compound skull fractures with intact dura showed uniformly elevated pressure; penetrating cranial wounds with retained foreign body showed low systolic pressures; and perforating skull wounds showed very high pressures when the wound involved the ventricles, and somewhat low pressures when it did not. In abdominal wounds seen within six hours of injury the systolic pressure was low when a hollow viscus was injured, while it was usually somewhat elevated in moderate wounds of solid viscera. If there was sepsis and hemorrhage the pressure began to fall in the hollow viscera wounds after the first ten hours, due to secondary shock. Perforating visceral wounds which did not open the peritoneum usually were accompanied with normal pressure. When the peritoneal cavity was opened at operation the blood pressure tended to rise somewhat for a few minutes and then to fall slightly below its previous height unless there was much retained extravasated blood, when the pressure fell very rapidly without the initial rise. Profound fall of pressure accompanied large open wounds of the chest with

free airway; uncomplicated closed wounds had normal pressures; severe internal hemorrhage was accompanied with progressive fall of pressure. Compound fractures of the extremities showed low pressures, specially when the fracture was near a joint; and multiple wounds of the body showed similar pressure responses. Infusion with normal saline caused an immediate rise of pressure which was promptly followed by a progressive fall and a greater concentration of the blood than before. The use of hypertonic saline solutions, colloidal acacia solutions, and direct transfusion all gave satisfactory results.

A Simple Procedure for Preparation of Colloidal Gold for Diagnostic Purposes.—O. I. Lee (*American Journal of the Medical Sciences*, March, 1918) says that colloidal gold solutions which conform to every clinical requirement may be made with comparative ease. It is quite unnecessary to use other than ordinary distilled water from any convenient laboratory still. Nothing is to be gained by elaborate precautions in cleansing the glassware used; apparatus washed with soap and water, rinsed in tap water, and hung up to dry has been found entirely satisfactory. The reagents used may all be introduced at the beginning of the experiment, and temperatures other than the final one disregarded. Providing sufficient oxalic acid is present the only critical points involved are the amount of formaldehyde used, and the passing of the color transition point at which the solution lightens and becomes orange red. Solutions so prepared were of the proper color and transparency. If a thick layer of the solution is transparent and of the proper color, a certain amount of surface dispersion is no bar to its usefulness.

The Urinary Tract in Pulmonary Tuberculosis.—S. William Schapira, Joseph Wittenberg and Sidney L. Spiegelberg (*Jour. A. M. A.*, March 2, 1918) studied 600 cases of tuberculosis of the lungs with reference to the occurrence of urinary tract involvement and symptoms referable to the urinary tract. They found that such symptoms as tenesmus, painful micturition, frequency, etc., were not proof of lesions of the urinary tract, and in only about a third of the cases with such symptoms could lesions be found. The symptoms did not seem to bear any relation to the passage of irritating urine, for they were often present with normal urine. Many urines were found, even catheterized specimens, in which acidfast organisms were present, but which were negative on animal inoculation. Tubercle bacilli were often found in the urine in the absence of subjective symptoms or of apparent lesions, and tuberculous bladder lesions were often found when the urine showed no tubercle bacilli. It seemed that tubercle bacilli tended to appear in the urine in showers and that specimens obtained between the showers were likely to be free from the organisms. It was apparent that the diagnosis of a tuberculous lesion of the kidney was a matter of great difficulty in the absence of very gross changes; and on the contrary the absence of evidence of involvement of one kidney when the other was known to be affected was extremely difficult to prove. Finally, the finding of a few tubercle bacilli in the urine from one kidney alone was not sufficient to condemn it.

Effect of Various Neutral Solutions on Gastric Discharge and Gastric Secretion.—W. E. Morse (*Archives of Internal Medicine*, January, 1918) reports a series of experiments performed in dogs. Solutions of sodium chloride of one to ten per cent. strength were found to increase slightly the rate of discharge of fluids from the stomach of anesthetized and pithed or splanchnotomized animals. Solutions of sodium acetate, on the other hand, slightly retarded the discharge. When sodium chloride or acetate solutions stronger than three per cent. were injected into the stomach, the fluid content of the latter was usually increased—an effect ascribed to osmosis exceeding the amount of discharge from the organ. The rate of secretion of gastric juice from injection of water into the stomach was not materially altered by ligation of the pylorus or by introduction of solutions of sodium chloride, sodium acetate, or tabasco pepper sauce. Solutions of the latter were discharged from the stomach at practically the same rate as water. Evidently, then, the mechanism of gastric discharge does not react to solutions of sodium chloride, sodium acetate, or tabasco sauce as it does to solutions of hydrochloric acid. Upon introduction of hydrochloric acid solution into the stomach with pylorus ligated, the acidity of the solution was found progressively to decrease; the rate of this diminution increased with the strength of the acid solution introduced.

Antenatal Syphilis.—Amand J. Routh (*Lancet*, January 12, 1918) enters into a detailed discussion of the facts which are known with reference to the occurrence of antenatal syphilis and to the changes which occur in the spirochetes which lead to their formation of granules through spirillois. As a result of this discussion he offers several conclusions and some hypotheses that explain some of the phenomena noted with reference to inherited syphilis. He concludes that the granules of the spirochetes are the infecting agents, and are able to develop into spirochetes under favorable conditions, or can remain biologically latent for years and subsequently produce active syphilis by the formation of spirochetes. The trophoblastic chorionic ferments produced at the contact of maternal and fetal portions of the placenta, either directly, or through the production of syncytial toxins are capable of attacking the spirochetes and converting them into the granule stage. The continued action of these ferments upon the granules throughout pregnancy may keep them latent and inactive, and, in some cases, perhaps destroy them. Following labor, when the ferments disappear from mother and child the granules may develop into spirochetes and produce active syphilis. Finally the degree of success of the chorionic ferments in protecting mother or child from infection depends upon the virulence of the infection, which tends to decrease with each succeeding pregnancy, and upon the source of the infection, paternal being the most favorable for destruction of the spirochetes, and maternal the least. The Wassermann reaction seems to remain negative so long as the spirochetes are in the granule stage, and this applies to both mother and child. These facts and hypotheses ex-

plain: 1, Why a pregnant woman may give birth to a syphilitic child and herself have a negative Wassermann reaction during and for some time after pregnancy; 2, why some syphilitic children are negative to the Wassermann reaction at birth and for some time thereafter; 3, why spirochetes are so rarely found in abortions; 4, and the mechanism of Colles's Law.

A Skin Ink for Radiography.—N. S. Finzi (*Brit. Med. Jour.*, January 12, 1918) arrived, by experimentation, at the following formula for the preparation of a suitable skin ink:

Pyrogallol acid,	1.0.
Methylated alcohol (B. P.),	10.0;
Solution iron perchloride (fort. B. P.),	2.0;
Acetone,	to make 20.0.

The mark made by this solution is brownish-gray at first, changing to brilliant black in a few hours. And the ink fulfills the following conditions: 1, It gives a color which shows against iodine; 2, it is not removed by rubbing with alcohol, acetone, ether soap, or tincture of iodine; 3, the mark lasts for many days; 4, the ink is quickly, easily, and painlessly applied by a camel's hair brush; 5, the ink does not injure the tissues; 6, the mark is visible as soon as made.

The Liver in Recent Malaria.—Marcel Labbé (*Bulletin de l'Académie de médecine*, January 15, 1918) states that while the hepatic cirrhosis of long standing malaria is well known, little attention has been paid to the liver in the more recent cases, in spite of the fact that the organ is usually enlarged in the severe forms and bilious attacks are frequent. In mild cases there is no evidence of true liver disturbance, though a special discharge of urea, ammonia, and especially of aminoacids, takes place at the time of the febrile attacks. In severe cases, there is anorexia, a coated tongue, tympanites, and slow digestion. The liver measures vertically ten to fifteen centimetres and is sensitive to pressure. Considerable emaciation is observed. Under these conditions bile formation is disturbed. The hemoglobin set free in the blood during the paroxysms reaching the liver, an attempt is made to change it to bile pigment, and the urine is golden yellow in color, or even darker, the skin becomes yellowish, and the conjunctivæ are at times subicteric. The condition suggests jaundice due to polycholia, yet there is produced no true or modified bile pigment. The urine contains no urobilin, but a pigment of as yet unknown composition—doubtless a derivative of hemoglobin devoid of iron and constituting one of the intermediate pigments in the formation of bilirubin. The glycogenic function of the liver is unaffected by malaria, but nitrogenous metabolism is markedly changed. Urea formation is impaired, and in the urine there is constantly a large ratio of ammonia, unaccounted for by the patient's restricted diet. No evidences of acidosis were noted. The disturbance of nitrogenous metabolism explains the marked general deterioration and loss of weight in severe malarial cases. Fortunately, the condition is not irremediable, for quinine treatment enables the liver to regain gradually its functional capacity. Repeated courses of alkaline treatment may be required to assist in this restoration.

Proceedings of National and Local Societies

PHILADELPHIA COUNTY MEDICAL SOCIETY.

Meeting of February 13, 1918.

The President, DR. FRANK C. HAMMOND, in the Chair.

Plastic Repair of Oral Mutilations from War Injury or Operative Attack.—Dr. JOHN B. ROBERTS in opening the meeting said his paper would find justification in the frequent avulsions in military surgery, the burnings with liquid fire in war, and the operative mutilations demanded by delay in radical treatment of malignant disease. While some difference in detail inured in the repair of lesions of lips, cheeks, and jaws from the causes mentioned, the principles of the surgeon's reconstructive acts and the steps through which the human organism responds to his desires were essentially the same. A surprising degree of ignorance existed as to the availability and success of treatment for these forms of facial deformity, and this ignorance appeared not only in rural populations but in large cities. Congenital malformations, like harelip and cleft palate, also cicatricial distortions from slow healing of burns and crushing injuries, appeared at metropolitan hospitals for treatment months, even years, after the precious moment when the aid of corrective surgery or dentistry should have been sought. The appreciation of the value of early plastic aid was gradually being instilled into the minds of surgeons by the lessons of the present war. The energy exhibited by the contracting force of fibrous tissue when it replaced granulation tissue in wounds was astonishing. Carrel and deNouy had shown that when open wounds were compelled by infection to heal through the conversion of granulation tissue into scar tissue, the major part of the closure was effected by dragging the boundaries of the ulcer toward a central point. The epidermization was reduced to a minimum and the cutaneous defense against ingress of microorganisms from without reestablished. The effect of this interstitial contraction on the surrounding and underlying structures was lamentably evident. Slow healing of wounds due to injury, tardy cure of ulcers left by supuration of tissues killed by fire, electrolysis, or chemical action, left eversion of lips and eyelids, closure of orifices of mouth and nose, strictures of ducts and produced adhesions which restrained the movements of joints.

Major HUNTER W. SCARLETT remarked that the pictures Doctor Roberts had shown reminded him greatly of the cases we received at the American Ambulance in Paris where he happened to be, in the first two years of the war, the only difference being that war wounds are infected. Such infection presents a serious problem and often it was from five to twelve months before they were able to do reparative work. In the work he was impressed with the importance of making flaps as large again as would be thought necessary for filling in of the gap, and of making their bases very large with enough subcutaneous tissue to insure nourishment and prevent superficial gangrene or deep sloughing. He

recalled two cases in which these precautions were not taken and in which consequent sloughing of the flaps occurred. There was not so much success in taking flaps from other portions of the body as in using the pediculated flap. An astonishing fact was that so large an amount of tissue might be lost and the membrane he brought to almost its normal position. In one case in which the whole side of the face was shot away, only the bony structures remaining, the wound cicatrized down to possibly an inch in diameter. Nature did much for these wounds. In a number of instances, after making the wound surgically clean and approximating the tissues, we left it exposed to the air except for a covering of gauze.

CAPTAIN BRUSH added that he appreciated the courtesy of Doctor Roberts in inviting the members of the military surgery class to discuss his paper. He could offer nothing interesting of personal experience but might refer to the technic of Morestin whom he saw operate in Paris. In operations under local anesthesia only three took part; he, the assistant, and the hospital nurse, this number being increased by the addition of the anesthetist when general anesthesia was employed. His instruments were in a large open box; very few towels were about. He was very rapid; brought the flaps up as far as they would stand the tension, then united them. His sutures were almost entirely of silk-worm gut, which was darkly stained to be easily seen. The sutures were put through the thick edge of the flap with the Hagedorn needle, the ends rapidly tied and allowed to hang long. These the assistant gathered up like reins, holding them until the end of the operation.

Dr. L. J. HAMMOND asked if Doctor Roberts would tell how he secured the mucous membrane lining for the newly formed lips and cheeks in cases in which there had been great loss of substance. He had found it essential to employ mucous membrane lining in order to obtain an approximation to normal contour of the lip.

Dr. C. B. LONGENECKER also asked Doctor Roberts how he determined the interval of time when the wound in a malignant case might be safely closed. If any of the malignancy remains the plastic work was, of course, useless.

Doctor ROBERTS, in answer, said when operating upon a malignant case he endeavored to get far beyond the area of the disease. He agreed with Doctor Longenecker that if this was impossible plastic work is not advisable. Replying to Doctor Hammond: he sometimes tried to save mucous membrane for lining the lip or cheek, but did not, however, pay so much attention to this as some operators, because he usually endeavored to get enough skin or muscle turned into the cheek to offset any probable contraction.

He agreed with Doctor Scarlett that Nature can do much more for these wounds if they are lightly dressed, for a big dressing soon became saturated with fluid and formed a pus poultice. He tried to dress all his operations dry, and often put on no

dressings at all if the lines of the incision were not too close to the orifice of the mouth or nose, where it would become contaminated. It was a standing rule that his assistant shall not wash the parts, except with a damp cloth, in the region not operated upon.

An Analysis of Fourteen Hundred Cases of Cancer Treated by Electrothermic Methods or in Combination with Operative Surgery, X Rays, or Radium.—Dr. WILLIAM L. CLARK, in giving his cases, said it had been found that electrothermic methods of treatment of cutaneous cancer were more uniformly reliable than other procedures, and this was also true of cancer of the lower lip and oral cavity; but, operative surgery, x ray, or radium might be used to advantage when metastasis has occurred. When glands or large bloodvessels are involved electrothermic methods could not be used with safety in the region of the bloodvessels. Operative surgery and x ray were usually preferred in mammary cancer, but a breast might be removed by electrothermic methods. Operative surgery, radium, or both in combination, ordinarily seemed best in cancer of uterine cervix, but electrothermic methods were also of value. Cancer of bladder and rectum, unless seen very early, was hopeless. If seen early, electrothermic methods offered the best chance of success. Electrothermic methods were successful when the disease was localized and they had the advantage over other methods in that the diseased tissue was entirely destroyed with one treatment, blood and lymph channels were sealed, and superior cosmetic results obtained. The successful treatment of cancer, generally speaking, meant the intelligent use of the methods best suited for individual case; or, when indicated, the use of combined methods.

Summary of One Hundred Cases of Cancer of the Uterus Treated by Radium.—Dr. JOHN G. CLARK said he was particularly impressed with the point brought out by Dr. W. L. Clark that so long as cancer is local it can be cured. In his own clinic they had had during the last three years considerably over 100 cases of inoperable cancer of the cervix. One hundred of these had been available for statistical study. So long as cancer is within operable bounds they applied surgical treatment, beginning the treatment of inoperable cases with radium on a purely palliative basis and so continuing it because they realize no case was a cure under five years, and in none had that length of time elapsed. They hoped and, indeed, believed, that after five years there would be a distinct percentage of these patients still alive and apparently free from the growth, because they had now quite a number beyond the two year period without signs of local cancer. Doctor Keene had been following these cases with him and watching them with a great deal of interest. They came from time to time for examination; consequently, the cases presented are those which have been controlled. They had compared results in the form of some tables; in other words, the palliative side seemed to be uppermost. There was one very interesting case in which two and a half years have now elapsed since the beginning of treatment. The woman weighed 240 lbs. and was a diabetic, therefore a

serious surgical risk. The radium was applied twice, and her symptoms, short of the discharge, had ceased. If there was metastasis, radium did not cure. The great danger in the use of radium was that the striking case impressed you with such force that you were likely to anticipate better ultimate results in all cases than might be realized. The argument for the use of radium was purely that of palliation with a strong degree of hope of cure because they were constantly seeing patients two, and two and a half years after treatment with no return. The average stay in the hospital was three days. The free patient could have the treatment while there was bed space, just as readily as the one who paid.

Dr. L. W. KOHN said he had been asked to speak on Doctor Goepp's paper upon the treatment of cancer of the stomach. Though the paper was not read, he would say that of all malignant conditions cancer of the stomach was perhaps most difficult to treat because of the difficulty of access to the organ. They had endeavored to recognize the condition early that the patient might be referred promptly for surgical treatment. When metastasis had occurred operation, of course, was unavailing. Their only resort then was to try to give the patient some degree of comfort in amelioration of symptoms and to offer psychic encouragement. A trial of radium might also be made. He understood that the Mayo brothers had treated well advanced cancer at the cardiac end of the stomach by the use of radium capsules inserted by means of the sound, and claimed a certain amount of benefit. Certain investigators also had advocated the vaccine and serum therapy.

Dr. G. C. BIRD remarked that unquestionably the electrothermic, coagulation and dessication methods should be used in some of the forms of epithelioma referred to the röntgenologist. After destruction of the growth the x ray was used to advantage in preventing metastasis. He had had no experience with the treatment of cancer of the uterus with radium, but had seen fibroid of the uterus in which he suspected malignant disease, treated by the Percy cautery, one of which remained cured for two years. In cases of malignancy of the uterus he would not think of depending upon the x ray for cure.

Dr. BARTON COOKE HIRST thought he would like to hear from Doctor Clark his experience with treatment by radium of recurrence of cancer of the uterus. Personally he had been discouraged with results. In many cases of recurrent cancer, after the complete removal of the uterus, radium treatment had been invariably unsuccessful except in one case. If however they succeeded in only one case out of a number this method ought to be adopted as routine. He had one case of very bad recurrence operated on two years ago last summer and within six months the patient had recurrence as big as his fist in the vaginal scar. She was referred to Doctor Newcomet and was now, having had seven or eight applications of radium, apparently entirely free from malignancy.

Dr. G. BETTON MASSEY's comment on these two very convincing papers was that they lead him to plead for the consideration of cancer as a progressive

disease, although the pathologists had not so determined. Approaching the subject from this standpoint and acting upon this probability would give hope in the early treatment, and they would have more early cases coming to them. The methods outlined by Dr. William L. Clark enabled them to make a frontal attack on these growths, which was not possible with the knife. In the knife treatment of cancer there must necessarily be no touching the cancer, and none of the infected cells must rest upon the wound. With the ionic, electrothermic methods and with radium a frontal attack, was made. They went through the disease and reached the periphery because they killed as they went. They made a periphery which was sealed against reimplantation of the germ. It seemed to him that they should be more exact in the use of terms; while radium was so successful in uterine cases it was not, in any sense, surgery, as were the other processes mentioned here.

Dr. C. B. LONGENECKER remarked that Doctor Clark spoke of the large number of cases of cancer of the uterus which were inoperable when first seen. For the last five or ten years there had been an effort made in the state, county and other societies to train physicians to the early recognition of cancer. Results, however, had not been gratifying, since they saw almost as many cases as before. He did not regard the application of the radium as quite so simple a matter as indicated by Doctor Clark; not every case would stand the same dose; he thought it advisable to try out the resistance of the individual before giving the massive dose. Beside the use of radium in the inoperable cases, they had other means of value. At the Jefferson they had the Coolidge tube by which an intensified x ray was had with an absolutely measured dose. A combination of the radium treatment and the Coolidge x ray was often an improvement upon the radium alone. While there was apparently, not much difference in the radiation of the two there seemed to be something reached by one not accomplished by the other. They frequently used also one of the electrical modalities in connection with the radium or the Coolidge tube.

Dr. F. HURST MAIER in conclusion, said he thought they were all impressed with the very conservative analysis given by Doctor Clark of his series of cancer of the uterus. If radium could do nothing more in inoperable cases than check hemorrhage, decrease the discharge, and relieve the pain in the percentage given, the treatment was indeed of much value.

Letters to the Editors.

THE USE AND ABUSE OF HEROIN.

PHILADELPHIA, March 10, 1918.

To the Editors:

In the issue of the NEW YORK MEDICAL JOURNAL for March 16, 1918, there is published the recommendations of the Public Health Committee of the New York Academy of Medicine and of the New York Psychiatric Society concerning drug additions. The names of these organizations and the names of the men forming the committees carry so much weight that it is akin to "defying the gods" to question any one of the recommendations

made. Nevertheless, I wish to call attention to the first: "We recommend that the Federal Government take such measures as are feasible to abolish the manufacture of heroin altogether."

There can be no justification of this sweeping and unqualified statement, unless it can be shown that this drug does more harm than good, and it is questionable whether any drug which possesses virtue, when properly used, should be taken away from physicians who treat persons needing it, because a number of weaklings suffer from its abuse, particularly if the present antinarcotic laws are enforced. Heroin is a drug which has proved its value or it would not be in existence today. That it is largely used in legitimate medical practice is proved by its admission to the U. S. Pharmacopoeia, for drugs are not so admitted until they are so generally prescribed as to be worthy of admission. A large number of physicians believe they get results from heroin which other so called opiates do not give, both in children and in adults, and it does not seem proper to deprive some people of relief because the law is not enforced. If it could be proved that heroin was used practically not at all in legitimate medicine and that nearly all of it was used by habitues, then the small numbers benefited as compared to the large numbers hurt might justify its abolition. Before this can be done there should be definite facts and not opinions before us. Doctor Stokes, the former Surgeon General of the U. S. Navy, in an article in the *Journal of the American Medical Association* for March 16, 1918, said at a public hearing in New York it was stated that there were 1,000,000 drug users in New York State, and then states that M. I. Wilbert, formerly of the U. S. Public Health Service, says the number is 175,000 for the whole United States, which latter figures were based on the sale of opium through trade channels. Such differences of opinion are evidence of lack of facts. It is a grave question whether the abuse of heroin produces all the evils for which it is blamed, and whether the addict has not a "twisted morale" before its use is begun.

Practitioners of medicine need every serviceable drug they can find, for one remedy suits one patient and another remedy the next case. Before a drug which is widely used is "wiped off the map" by Federal legislation, even if we suppose that this is the right way to go about it, would it not be well to find:

- 1st. How many persons abuse heroin?
- 2d. How many of these persons are so constituted that if they did not abuse heroin they would abuse something else?
- 3d. How many of these present symptoms are not due to heroin, but to individual defects?
- 4th. How many physicians use it lawfully?
- 5th. How many patients are relieved by its use as compared to the number actually damaged by it?
- 6th. Why the antinarcotic laws, so called, fail to meet the difficulty? If they do for heroin and not for other opiates, it would appear that this drug must possess qualities which when properly used would be of great value to the sick.

HOBART AMORY HARE.

THE UBIQUITOUS LAYMEN.

NEW YORK, March 30, 1918.

To the Editors:

There are pending at this time before the Legislature of this State matters of legislation relating to the practise of medicine which are revolutionary, unconstitutional and dangerous to the community. These are designed to bring about a lay and political control of strictly medical duties at a time when, almost without exception, medical men of military age are serving with the colors in camp or in field, while those outside this age are serving as volunteers at home in different capacities for the Government, a condition that easily lends itself to their exploitation. Among no other class, lay or professional, has the call of duty been obeyed more unhesitatingly or with more sacrifice of personal interest than among the medical profession.

Under one of these laws a lay "commissioner of drugs" with a staff of deputies would control the practise of medicine as far as it relates to the prescribing

and dispensing of one of the most important and frequently used agents in medical practice—opium and its derivatives. It would place under the surveillance of the State, as tainted with criminality, all those to whom this drug would be administered, and make possible the incarceration, at the behest of an interested party, any one to whom it had to be given continuously, even when done under the direction of the highest medical authority. All this under the contention that the criminal use and distribution of drugs cannot be controlled by the police power of the State.

Even if given all this power the authors of the measure have been compelled to admit a possible failure, and still other measures, international in scope, would have to be employed eventually if they were to be successful in this form of police duty.

It would seem from all this that the unfortunate victim of drug addiction has only been released from the clutches of the commercial exploiter of his misfortune to fall into the hands of the political one.

Under the guise of compulsory health insurance another measure would place under the control of the State Industrial Commission, by and with the advice and consent of the Federation of Labor, the medical care of eighty-five per cent. of the population of this State. It would displace and substitute for the family physician the contract State employed doctor, a form of contract labor strenuously opposed by labor men in their own field. Until it was shown to them that by this act 150,000 new political places would be created under their auspices, the labor men strenuously objected. Now they see millions in it for their followers, and also political ascendancy in it for their leaders. Both of these measures are unanimously opposed by the entire medical profession, and, in justice to these, the measures should not be passed, least of all during the period of the war.

JOHN T. DAVEN, M.D.

Book Reviews.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

Diseases of the Skin. By RICHARD L. SUTTON, M.D., Professor of Diseases of the Skin, University of Kansas School of Medicine; Former Chairman of the Dermatological Section of the American Medical Association; Member American Dermatological Association, etc. With Eight Hundred and Thirty-three Illustrations, and Eight Colored Plates. Second Edition, Revised and Enlarged. St. Louis: C. V. Mosby Company, 1917. Pp. 1021 (Price, \$6.50.)

The second edition of Sutton's *Diseases of the Skin* has just appeared. In looking it over carefully, I was struck by the practical nature of the book, although wishing for a fuller discussion of the various receptors which are found in the mucous membrane and the skin, and a more up to date discussion of the results of recent histological research. The author does not attempt to distinguish the functional qualities of the nervous supply and, therefore, does not go into the question of the metabolism of the skin in any constructive manner. There are absolutely no references made to the vegetative nervous mechanisms which lie at the very base of the health of the skin itself. A discussion of epirritic and protopathic sensibility is all very well, but these are comparatively insignificant in a study of skin diseases, unless, as in the case of protopathic sensibility, it is made clear whether or not such protopathic sensibility is not after all a purely vegetative function. They are distinctions of value to the psyche of the individual in determining his social adjustment, but of comparative unimportance from the dynamic point of view of skin metabolism. There is an utter absence of any recognition of the fact that a skin disease may have any relationship to the mental or social life of the individual, a point of view which undoubtedly is minor considering

the practical problems which the dermatologist has to handle. Still, such a viewpoint might have been mentioned, especially in connection with the as yet unsuccessful methods of treating certain chronic disorders such as acne, psoriasis, eczema, etc. Apart from certain strictures of this nature, we regard the work as one to be especially commended to the practitioner. From the purely descriptive standpoint this is one of the best books with which I am acquainted. It is beautifully illustrated, practically arranged, and, from a mechanistic point of view, above reproach.

An International System of Ophthalmic Practice. Edited by WALTER L. PYLE, A. M., M. D., Philadelphia, Member of the American Ophthalmological Society. *Medical Ophthalmology.* By ARNOLD KNAPP, M. D., Professor of Ophthalmology, Columbia University; Executive Surgeon, Herman Knapp Memorial Eye Hospital. With Thirty-Two Illustrations. Philadelphia: P. Blakiston's Son & Co., 1918. Pp. xv-509. (Price, \$4.00.)

This book deals with the relations which exist between ocular lesions or symptoms, and abnormal conditions in other parts of the body. The first chapter, to which all the illustrations are confined, discusses the anatomy of the nervous system connected with sight, the movements and diagnostic importance of the pupils, the cerebrospinal fluid, and the diagnosis of intracranial optic path lesions. The succeeding chapters demonstrate the breadth of the intimate relations of the eye to all other organs in the body, as they deal with the ocular affections dependent on diseases of the nervous, circulatory, respiratory, digestive, and osseous systems, of glands with internal secretions, of the female generative organs, of the kidneys, and of the skin, as well as on infectious diseases, anemia, diabetes, and poisons. The final chapter is on hereditary diseases of the eye.

The most important lesson taught by this book is that the eye is one of a system of interdependent organs: that these organs react upon and are affected by diseases of one another, so that if the reader would be a really efficient ophthalmologist he must be a physician with a broad knowledge of the entire field of medicine, otherwise he will not be able to recognize as symptomatic of trouble elsewhere a great many of the ocular lesions and symptoms for which he is consulted, and therefore will be unable to give the relief sought for to as great an extent as he should.

A Practical Text-Book of Infection, Immunity and Specific Therapy. With special reference to immunologic technique. By JOHN A. KOLMER, M. D., Dr. P. H., M. S. C., Assistant Professor of Experimental Pathology, University of Pennsylvania; Professor of Pathology and Bacteriology, Philadelphia Polyclinic, and Pathologist to the Department of Dermatological Research, etc. With an Introduction by ALLEN J. SMITH, M. D., Sc. D., LL. D., Professor of Pathology, University of Pennsylvania. With 147 Original Illustrations, 46 in colors, by ERWIN F. FABER, Instructor of Medical Drawing, University of Pennsylvania. Second Edition, thoroughly revised. Philadelphia and London: W. B. Saunders Company, 1917. Pp. xiii-978. (Price \$7.)

To see a volume of nearly 1,000 pages devoted to the subject of immunity and its practical applications gives realization of the great expansion of the field of work that has taken place during recent years. To mention only one of its phases, vaccine therapy, which half a dozen years ago was rather timidly undertaken by the few, has now become a routine method of treatment with the many—though only too often, it must be admitted, with results that leave much to be desired. This is, of course, largely owing to the fact that the principles of its application are still in process of development, and that what has already been ascertained is still much of it imperfectly known to those who make use of the preparations of bacteria with which the market is so plentifully supplied. For those who wish to inform themselves in regard to the present state of knowledge in this subject and all related departments, no more satisfactory work than this splendid book of Dr. Kolmer's can be recommended. Comprehensive in scope, beautifully and profusely illustrated, containing much that is original, it is well designed to serve as a guide in the application of the bacteriological and serologic

ical methods to the treatment of disease and is therefore just as useful to the practitioner as to the laboratory worker. For the latter it forms an unusually complete and detailed text-book with full descriptions of technical procedures and discussion of methods. In this edition much that is new has been added, including among others, the following subjects: The Schick reaction in diphtheria and active immunization in this disease with toxin and anti-toxin mixtures, complement fixation in tuberculosis and other infections, a quantitative Wassermann reaction, the colloidal gold reaction vaccine therapy, the treatment of acute infections, especially acute anterior poliomyelitis, with convalescent or normal serum, blood transfusion, chemotherapy, salvarsan reactions, etc.

Soins Oculaires. A L'Usage des Infirmières. Par H. COPEUX, agrégé à l'Université libre de Bruxelles, et A. VAN LINT, chef de Service à la Policlinique de Bruxelles. Avec 114 figures originales dans le texte. Paris: Masson et Cie., 1918. Pp. 186.

If we may judge from the words of the authors, conditions with regard to the teaching of ophthalmic nursing are about the same in France as here. Training schools for nurses have multiplied, and the pupils, during their courses of instruction, study manuals which are well written from the point of view of general surgery and medicine, but leave much to be desired in their chapters on ophthalmic nursing. Adequate instruction in the technique of such essential matters as how to cleanse an inflamed eye, how to introduce remedies, how to perform the many little things that conduce so greatly to success in treatment, is seldom to be found. To a great extent the nurse is left to discover how to perform them as best she may. For this reason there is a well marked need, whether there is a demand or not, for just such books as this.

The plan of the book is excellent. First comes a brief description of the eye, sufficient to explain the meaning of the terms employed later. In the succeeding chapters are given in detail the methods of examination a nurse may be called upon to use, the technique of cleansing an eye, of applying a dressing, of instilling a drop, of introducing an ointment, of insufflating a powder, of using a crayon, and of the application of heat and of cold. Massage, cupping, and scarification are each given considerable and adequate attention. Then come the duties of the nurse with regard to the light, air, heat, and furniture of the patient's room, her duties in the operating room, including the sterilization of instruments, the psychical and physical preparation of the patient for operation, and post-operative care. Chapters follow on the special technique to be observed in infants, children, in the care of the eyes of sick people and convalescents, and in dealing with emergencies, such as foreign bodies, burns, bruises, and wounds. The final chapters are devoted to artificial eyes, and the usual remedies and instruments employed in the treatment of the eye. The principal thing to be regretted, so far as we are concerned, is that the book is not in English.

An Intermediate Textbook of Physiological Chemistry with Experiments. By C. J. V. PETTIBONE, Ph. D., Assistant Professor of Physiological Chemistry, Medical School, University of Minnesota, Minneapolis. St. Louis: C. V. Mosby Company, 1917. Pp. 328.

This text book seems to be a valuable one. It is written by a member of the chemistry department of the University of Minnesota, the source of some of the best work in the country, and we do not hesitate to recommend it highly. From our knowledge of the literature we cannot remember an important work including the exact material that this text book covers. It presents a short, explicit, yet comprehensive discussion of this field of chemistry which some hail as the future hope of medicine. It seems likely that this book serves as an important link between general organic and advanced physiological chemistry, and that it would be well worth the attention of the student who wishes such a transition text book. The material has been carefully selected with a view to setting forth the present status of physiological chemistry, while avoiding lengthy discussion of debated points. Part one covers theory and science; part two constitutes a laboratory manual. The whole work covers the essentials and the instruction seems careful, complete, and concise.

The Essentials of Chemical Physiology. For the Use of Students. By W. D. HALLIBURTON, M. D., LL. D., F. R. S., Fellow of the Royal College of Physicians; Professor of Physiology in King's College, London, etc. Ninth Edition. With Colored Plate. New York and London: Longmans, Green & Co., 1916. Pp. xi-324. (Price \$1.75.)

This has been for many years one of the standard texts in physiology and occupies a deservedly high place in the regard of both teachers and students. The frequent revisions to which it has been subjected have kept it thoroughly modern in matter and manner, and among the new sections introduced into the present edition is to be noted the following: the ninhydrin reaction, the urease method for determining urea, the benzidine method for determining the urinary sulphates, and the Lewis-Benedict method for determining blood sugar.

Births, Marriages, and Deaths.

Died.

BISHOP.—In Smithsburg, Md., on Monday, March 11th, Dr. Elijah Tracy Bishop, aged eighty-five years.

BUCK.—In New York, N. Y., on Saturday, March 16th, Dr. Emory Valentine Buck, aged seventy-five years.

CAIN.—In Indianapolis, Ind., on Friday, March 8th, Dr. Charles Masters Cain, aged thirty-four years.

CANEY.—In North Adams, Mass., on Monday, March 11th, Dr. Ransford DeLos Caney, aged forty-five years.

COSTOLO.—In Lima, Ohio, on Thursday, March 7th, Dr. John W. Costolo, aged sixty-six years.

COX.—In Superior, Wis., on Wednesday, March 13th, Dr. Albert Jeffrey Cox, aged fifty-six years.

CURFMAN.—In Denver, Colo., on Friday, March 8th, Dr. George W. Curfman, aged forty-one years.

DUNCAN.—In Atlanta, Ga., on Monday, March 11th, Dr. John Wesley Duncan, aged seventy-five years.

GRIMES.—In Murphysboro, Ill., on Thursday, March 14th, Dr. John Patrick Grimes, of Menard, Ill., aged forty-two years.

HALLEY.—In Kansas City, Mo., on Monday, March 11th, Dr. George Halley, aged seventy-eight years.

HANNER.—In Franklin, Tenn., on Wednesday, March 6th, Dr. James P. Hanner, aged eighty-two years.

HARMON.—In Sheridan, Wyo., on Monday, March 11th, Dr. Claude A. Harmon, First Lieutenant, Medical Reserve Corps, U. S. Army, aged thirty-eight years.

KENNEDY.—In Washington, D. C., on Tuesday, March 5th, Dr. Linn L. Kennedy, aged forty-six years.

LEVINGS.—In Milwaukee, Wis., on Monday, March 4th, Dr. A. Hamilton Levings, aged seventy years.

MCDONALD.—In Brooklyn, N. Y., on Monday, March 25th, Dr. William Ogden McDonald, aged eighty-two years.

MICKLEY.—In Camp Dix, Wrightstown, N. J., on Saturday, March 16th, Dr. Harold Franklin Mickley, First Lieutenant, Medical Reserve Corps, U. S. Army, of Seneca Falls, N. Y., aged twenty-seven years.

MOESER.—In Montrose, Ill., on Friday, March 8th, Dr. Ralph E. Moeser, aged thirty-three years.

MOORE.—In Philadelphia, Pa., on Wednesday, March 6th, Dr. Albert Mehrer Moore, aged forty-one years.

NICKERSON.—In New Bedford, Mass., on Wednesday, March 6th, Dr. William J. Nickerson, aged seventy-three years.

O'DEA.—In Erie, Pa., on Saturday, March 9th, Dr. Charles Augustus O'Dea, aged forty-three years.

PALMER.—In Philmont, N. Y., on Saturday, March 9th, Dr. Elton J. Palmer, aged sixty-eight years.

ROESCH.—In Chicago, Ill., on Thursday, March 21st, Dr. Frederick Roesch, aged eighty-eight years.

RONAYNE.—In New York, N. Y., on Monday, March 18th, Dr. John A. Ronayne, of Astoria, aged forty-four years.

SCHOFIELD.—In Baltimore, Md., on Thursday, March 7th, Dr. John Calvin Schofield, aged fifty-three years.

SMITH.—In Wilmington, Del., on Wednesday, March 6th, Dr. Frank Rock Smith, aged sixty-two years.

STEWART.—In Wilberforce, Ohio, on Thursday, March 7th, Dr. Susan Maria Stewart, aged seventy-two years.

STEWART.—In Clearfield, Pa., on Monday, March 11th, Dr. Samuel C. Stewart, aged sixty-one years.

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Original Communications

HEMORRHAGE OF THE NONPREGNANT UTERUS.*

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In order to treat bleeding from the female genitalia successfully it is necessary that the physician shall determine the organ or structure from which the hemorrhage occurs and the etiology of the circulatory disturbance. In this paper, hemorrhage of the uterus only, not due to pregnancy, will be discussed.

In order to ascertain the cause of bleeding, too much stress cannot be laid upon the necessity of an accurate history. It is necessary to know whether the type of bleeding is a menorrhagia or metrorrhagia. A woman will refer to any genital bleeding as her "period," hence the necessity of a close interrogation in order to ascertain the exact type of bleeding; also, whether the bleeding is attributed to traumatism, directly affecting the bleeding spot or indirectly producing rupture by increased pressure on the blood vessels. These latter causes include coition, vaginal irrigation, and vaginal examination. Always remember that under these circumstances, bleeding never occurs from a normal mucous membrane. You may elicit the history that bleeding follows hard work or the lifting and carrying of heavy burdens. In such instances remember that a healthy mucous membrane rarely bleeds; such a history is generally indicative of endometritis, carcinoma, an exposed tumor, an ulceration, or the presence of a very vascular, delicate tissue, as an ovum.

Uterine hemorrhage may be due to violent nervous excitement or fright or even be produced by a severe cold. Other causes to be borne in mind are psychic depression, profound physical overexertion, and general debility. The vasomotor apparatus may be affected under these conditions even though the pelvic structures are normal. Menopausal and postmenopausal hemorrhages should receive the strictest observation, as it is during this time of life that carcinoma of the uterus develops in about sixty-five per cent. of cases. Any bleeding at an unusual time

from the vagina of a woman over thirty years of age demands a thorough physical examination, while a hemorrhage in a woman who has passed the menopause invariably should arouse the greatest suspicion. There is no diagnostic value to the quantity of blood lost and the effect of the hemorrhage on the individual, but there is a direct relation as to prognosis, the institution of medical treatment, and surgical interference.

After a careful study of the history findings, the physician should proceed with a gynecological examination whether or not the patient is bleeding at the time. In some cases more or less difficulty may be experienced to determine whether or not the bleeding comes from the uterus. If there is bleeding from the genital tract, and the vulva and vagina can be definitely excluded, the bleeding must come from the uterus. If the bleeding originates from the vaginal portion of the cervix or the lower part of the cervical canal or from a new growth protruding from the cervix, it can easily be seen. If not, then the bleeding comes from the body of the uterus and will require certain surgical procedure to make the diagnosis secure. "The diagnosis of uterine hemorrhage covers a large field, including diseases of the uterus and annexa, general organic and nervous diseases, and temporary disturbances of the circulation. To pick out the true cause from all these conditions is, in my opinion, one of the most difficult tasks that the physician is called upon to perform. Any bleeding other than that of menstruation is abnormal; excessive menstruation and irregular bleeding of every kind are pathological and must have a special cause" (Clark).

Simple erosion of the cervix, with or without laceration of the cervix, is a condition which may frequently be seen in women whose general physical condition is below par and who suffer from an irritating discharge from the vagina or endometrium. These patients bleed more or less profusely on the gentlest examination. Simple erosion often is mistaken for carcinoma of the cervix or vice versa.

Cervical polyps.—Uterine hemorrhages are more or less constantly present. The bleeding may be slight, following straining at stool or sexual intercourse, or it may be so profuse as almost to exsanguinate the patient. If the polyp protrudes through the cervix, it can readily be seen through a speculum. If it occupies the upper portion of the cer-

*Read before the Samaritan Hospital Medical Society, January 14, 1918.

vical canal, it cannot be detected until the cervix is properly dilated.

Cancer of the cervix.—The importance of an early diagnosis in malignant disease of the cervix cannot be overestimated. Cancer in its early stages is a strictly local condition and its early diagnosis followed by prompt radical extirpation of the malignant focus will do more than anything else to reduce to a minimum the recurrence in the cases. The responsibility for this early diagnosis rests with the attending physician. It is he, and not the gynecologist or surgeon, who is first consulted. It seems to me that until some revolutionary discovery is made by which cancer may be eradicated, the greatest prospect for improvement lies in teaching the profession and the public the necessity for the early recognition of cancer of the uterus and its immediate subjection to operation. The diagnosis in the early stages is not always easily made. It will be necessary to differentiate cancer of the cervix from eversion of the cervical mucosa, simple erosions or ulcerations of the cervix, cervical polypi, cervical myomata, tuberculosis, and syphilitic lesions of the cervix, all of which produce bleeding. The earliest symptom of cancer of the cervix is bleeding which only may be a bloody smear. In women who have not passed the climacteric, the hemorrhage is usually attributed to excessive menstruation or to "change of life." In women who have passed the climacteric it is often regarded as a return of the menses and is frequently looked upon with considerable complacency. The amount of blood lost gradually increases until intermenstrual hemorrhages appear. At first the patient may discover occasionally a few drops of blood on her underclothes or there may be a slight hemorrhage after intercourse or following the use of the vaginal douche. This bleeding is influenced to a great extent by the patient's surroundings. For example, any unusual exercise, as horseback riding, dancing, lifting heavy weights, may be sufficient to start bleeding. A vaginal examination is always attended with more or less bleeding. The slight hemorrhages constantly increase in frequency and amount until there is an almost continual loss of blood of varying extent.

Chancre and chancroid of the cervix are rarely seen, but when they are present may give rise to bleeding and should not be forgotten from the standpoint of diagnosis.

The following diseases of the uterus will produce bleeding: Fibroids; carcinoma; sarcoma; chorio-epithelioma; syphilitic or chronic metritis; chronic endometritis; senile endometritis. The diagnosis of diseases of the uterus, in order to determine the cause of the bleeding, is made: by bimanual examination, by which the size, position, and consistency of the uterus and all features incident to the palpation of this organ may be determined; by dilatation and curettage, and by intrauterine digital examination.

Any or all of these procedures may be necessary to complete the diagnosis. Here again may I be permitted to lay stress on the early diagnosis of cancer of the uterus. I am still convinced that a curettage of the uterine cavity carried out as com-

pletely as possible, with subsequent histological examination by a competent pathologist, remains the best means of diagnosing uterine carcinoma, even at the outset of the condition. In the presence of a negative or doubtful curettage, combined with suspicious clinical symptoms, the latter alone must be relied upon as an indication for operation.

Stress also must be laid upon the fact that we must cease to consider forty-five to fifty years of age as the so-called "cancer age." The literature fairly teems with the number of cases of cancer of the uterus occurring from the age of twenty-one years to the menopause, and several years after the menopause. In 1916, Adams, of England, reported a glandular carcinoma of the uterus in a child aged two and one-half years. Three weeks previous to the child's admission to the hospital, she had a bloody flow from the vagina which had increased in amount and frequency. An ineffectual attempt was made to remove the growth. The child died two months later. An autopsy was obtained and a careful pathological study made. If the uterus is excluded as the source of the bleeding, then the surrounding structures must be studied.

Secondary uterine hemorrhages are due to diseases of the annexa, peritoneum, or parametrium. The tubal diseases to consider are hematosalpinx, hydrosalpinx, and pyosalpinx, which will form masses in the pelvis, causing pressure of the uterus, interfering with return circulation, and in this manner producing bleeding from the uterine cavity. These so called secondary hemorrhages will continue until the tubal or tubovarian pathology is removed. Pelvic peritonitis may occasionally cause uterine bleeding, and diseases of the parametrium may do so very rarely.

Hemorrhage without any abnormal physical signs.—Under this heading too frequently one may group cases which in reality are mistakes that have been made in diagnosis. There are cases, however, that legitimately belong under this heading, viz.: "Excessive hemorrhages, whether menstrual or intermenstrual, due to violent emotion, fright, and sudden changes in temperature. They also may be brought on by indiscretion during the menstrual period, such as dancing, gymnastics, sexual excitement, or hard physical labor. It is not always easy to ferret out the direct cause of these acute circulatory disturbances, but it is important to decide whether the hemorrhage is merely an excessive menstruation or the initial symptom of an inflammatory or malignant disease" (Clark).

Hemorrhagica myopathica metra.—Occasionally there is seen the patient who continues to bleed from the uterus after the removal of diseased tubes and ovaries, the so called hemorrhagica myopathica metra. I remember one patient of this kind who returned to have a supravaginal hysterectomy done and promptly continued to bleed from the cervix, and it was necessary later to remove the uterus in order to control the bleeding.

Unsuspected syphilis.—I know of three women, presenting uterine bleeding, all of whom had been subjected to several curettages, without any amelioration of symptoms. The gynecological findings were negative. A Wassermann in each instance

showed the true cause. A very interesting case was admitted to the gynecological ward of the Samaritan Hospital service of Dr. Wilmer Krusen several months ago.

CASE.—The patient was a girl twelve years of age of precocious physique. The attending physician had her under observation for two to three months for more or less constant uterine bleeding. She had been bleeding for several weeks previously to the time he was consulted. He had exhausted all medicinal measures and referred her to the hospital for a curettement. Upon admission a thorough pelvic examination was made, with negative findings. A Wassermann test was done, result + 4. Intravenous arsenical therapy was instituted and the bleeding ceased within a few days after the first injection. There has been no recurrence since the specific treatment was begun.

Internal diseases.—If no local lesion can be detected and syphilis is excluded, the hemorrhage may be due to general conditions which, however, are extremely rare causes. Under this heading may be included typhoid fever, scarlet fever, grippé, acute articular rheumatism, malaria, smallpox, hemophilia, scorbutus, uncompensated cardiac lesions, diseases of the liver, pulmonary emphysema, and general lowered vitality.

3311 NORTH BROAD STREET.

INFECTION AND RESISTANCE.

A Résumé of Fundamental Data.

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Infectious disease is the symptom complex expressive of the interaction between parasite and host. Immunology is the study of the forces manifested in this interaction between infecting agent and infected organism.

The nature of the parasite.—Let us consider for a few moments the parasite or infecting agent. The parasite may be bacterial, higher bacterial, vegetable, or protozoal. In the great majority of infectious diseases the parasite is bacterial in nature, being either a coccus, a bacillus, or a spirillum. It may be a member of the group of higher bacteria, a yeast, a mold, or a protozoan. The higher bacteria are considered under four heads: 1, streptothrix, producing true branches and spores; 2, cladothrix, with false branching, due to fragmentation of threads; 3, leptothrix, simple threads; and 4, actinomycetes, marked by a stellate arrangement of the threads, with clubbed ends. The streptothrices give rise to a not uncommon pulmonary infection which closely simulates tuberculosis. Actinomycetes is the causative agent of actinomycosis or "lumpy jaw" of cattle and man. The parasite is acquired through the agency of hay, straw, and grain and commonly affects the jaw. It may invade the lungs and intraabdominal organs. The disease is very chronic and heals by calcification. The yeasts—blastomycetes, saccharomycetes—reproduce by budding. They are the causative agents in blastomycosis of the skin and elsewhere. The molds or hyphomycetes are characterized by the formation of hyphæ or mycelial threads. They are responsible for such conditions as pityriasis versicolor, thrush, favus, ringworm, and others.

The protozoa are divided as follows: sarcodina, possessing pseudopodia and reproducing by simple division or spore formation; mastigophora, possess flagella, mouth, contractile vacuole, and nucleus; infusoria, possess cilia, macronucleus, and micronucleus, and reproduce by transverse fission or by budding; and sporozoa, endoparasites, taking food by osmosis, possessing in the adult state no flagella or cilia, and reproducing by spores. The protozoa which are parasitic for man are the following: of the sarcodina, entameba; of the mastigophora, trypanosoma; of the infusoria, balantidium; of the sporozoa, plasmodium, piroplasma and coccidium. The infectious diseases due to protozoa constitute an important group. Chief among these is malaria. The higher bacteria, the yeasts and the molds, however, infect the human host comparatively very seldom. The true bacteria are the chief offenders. The cocci, the bacilli, and the spirilla cause the great majority of infectious diseases.

We are accustomed to think of a bacterium as a very simple organism. Structurally it is exceedingly simple. It is a unicellular living form; that is, the bacterium is composed of only one cell, which grows and multiplies. It cannot be identified with the animal kingdom. For certain reasons it has been placed in the vegetable kingdom. These reasons are: the protoplasm is undifferentiated; there is occasionally a cellulose membrane (disputed); the biological tendency is to synthesize as well as to break down organic compounds; 4, transitional forms seem to connect bacteria directly with the lower plants. Vaughn (1) has been unable to demonstrate cellulose membranes upon bacteria. He feels that they cannot, therefore, be placed in the vegetable kingdom. He prefers to consider them not as animals, not as plants, but simply as bacteria—minute particles of living protoplasm or "particulate protein." With respect to the nucleus of the bacterial cell, Vaughn states that nuclear material is so abundantly and so uniformly disseminated throughout the bacterial cell, that the bacterium is practically all nucleus. Although structurally very simple, physiologically or chemically the bacterium is exceedingly complex. The metabolism of a bacterial cell is quite as involved as that of any cell. As Vaughn points out, the struggle between bacterial cells and the cells of the human body is not that of a pigmy against a giant, but on the contrary, a battle upon very equal terms, with the issue always in doubt.

Among bacteria there exists great differences in metabolism and hence, great differences in the manner of attack upon the human host and in the manner of resistance of that host. Thus we have many different clinical pictures of infectious disease, for the clinical picture depends upon, first, the nature of the infecting organism, and, second, upon the nature of the resistance of the host. Another consideration which is sometimes of importance is the site of the infection.

Infection on the surface of the body.—The presence of a pathogenic microorganism on the surface of the body, on the skin, or on the mucous membrane of the respiratory, alimentary, or genitourinary tract

does not constitute infection. The surface barrier must be passed. The microorganism must get beneath the surface. Infection may then be said to exist, but infection is not necessarily infectious disease in the clinical sense. A conspicuous example may be found in the case of the rat infected with the

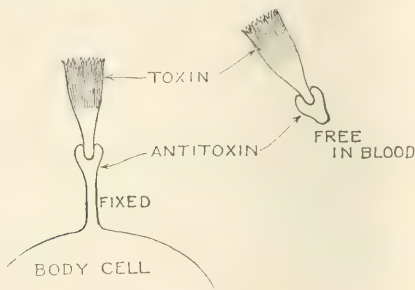


FIG. 1.—Haptine of first order.

Trypanosoma lewisii. This comparatively harmless trypanosome is found in the blood of from two to three per cent. of wild rats throughout the world. It constitutes infection of a high order without any evidences of associated disease. Such a striking example is difficult to advance in the case of man, in whom infection commonly terminates in infectious disease. During the period of incubation, however, although infectious disease is not manifest, infection exists. Infection consists in the invasion of the body by the parasite: Infectious disease is the symptom complex produced by the interaction of parasite and host. We may approach the diagnosis of infectious disease in two ways. We may determine, or attempt to determine, the nature of the causative agent; or, on the other hand, we may determine the nature of the reaction of the host.

One method of diagnosing infectious disease is by

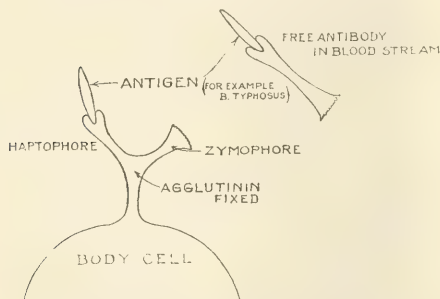


FIG. 2.—Haptine of second order.

determining the nature of the causative agent. This is done by demonstrating the parasite by direct microscopical examination in protozoan diseases, as trypanosomiasis, kala azar, Vincent's angina, syphilis, yaws, relapsing fever, amebic dysentery, malaria; in tuberculosis, leprosy, actinomycosis, streptothricosis, blastomycosis, thrush, favus, ring-worm, sporotrichosis, in diphtheria, in gonorrhea, and in meningococcus meningitis. The parasite may

also be demonstrated by cultural examination in typhoid fever, paratyphoid fevers, streptococcus disease, and other bacteriemias, and in purulent infections anywhere. Animal inoculation substantiates findings of either of the above methods, and is used in such diseases as are caused by the filterable viruses, or those which filter through unglazed porcelain or diatomaceous earth filters, as yellow fever, dengue, foot and mouth disease, rabies, variola and vaccinia, pleuropneumonia of cattle, and hog cholera. The nature of the causative agent may also be determined by demonstration of some of the products of the parasite, as in the Forner ring test for the demonstrating of precipitinogen in the early diagnosis of typhoid, scarlet, measles, and syphilis. The other method of diagnosing infectious disease is by determining the nature of the reaction of the host. This is done chiefly by signs and symptoms or clinical methods.

Gross anatomical reactions are demonstrated in skin lesions, which may be classed also as signs, and autopsy findings. Microscopical anatomical reactions show changes in the unfixed cells, as of blood and of body fluids (the subject of hematology), and

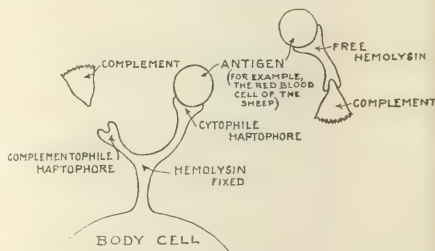


FIG. 3.—Haptine of third order.

changes in the fixed cells (histopathology). The reaction of the host is also detected in chemical reactions. These are classified as nonspecific chemical changes, as albumin in urine, increased globulin in spinal fluid, etc., and specific chemical reactions to wit, those of antitoxins, precipitins and sensitizins, agglutinins, lytic substances, opsonins, and unknown potentialities. It is with the last group, the group of specific biochemical reactions, that we are particularly concerned. Antitoxins, precipitins, etc. are called in general antibodies. Another term used is immune bodies. A simple graphic conception of antibodies or immune bodies is that of Ehrlich.

Ehrlich (2) used still another term, haptines, and pictured three orders of haptines. He described them as follows: Haptines of the first order: antitoxins and antiferments. Such an antibody consists of a single group, which acts to neutralize its corresponding antigen very much as a base neutralizes an acid. Haptines of the second order: precipitins and agglutinins. Such an antibody consists of two groups, one of which is a combining group or haptophore group, and the other of which is a constantly attached active or zymophore group. Haptines of the third order: lytic amboceptors, as bacteriolysins and hemolysins. Such an antibody possesses two combining groups, a cytophile haptophore and a

complementophile haptophore. The action of such an antibody is made manifest by the attachment of an originally detached zymophore complement. Ehrlich's so called theory is certainly not an embodiment of the whole truth, but it is readily amenable to pictorial representation. The conception of Bordet (3), which is that antigen antibody reactions are physicochemical affairs, falling within the domain of colloidal chemistry, is more nearly in accord with all the facts in the case, but is not so easily demonstrable in pretty little diagrams.

Immunity.—Immunity, the word, is derived from the Latin, *immunis* meaning safe or exempt. It is used to denote that condition in which one is safe from infection. Immunity is of many kinds and of many degrees. It is commonly considered under two heads: natural immunity and acquired immunity. Natural immunity may be one of three kinds: species immunity; racial immunity; individual immunity. Instances of natural immunity which depend upon species are common. Thus, avian tuberculosis is due to the bacillus tuberculosis, avian variety, which is accustomed to growth at 40° to 45° C. and which does not grow at 37° C. as in man. On the other hand, human or bovine tuberculosis does not infect birds. Cattle, swine, and sheep are relatively very resistant to human tuberculosis. Human infection with bacillus tuberculosis, bovine type, is unusual except in children, in whom about one third of the cases are bovine. The large majority of the bovine infections in children are abdominal, or involve the cervical lymph nodes. The infection is undoubtedly through the gastrointestinal canal. Syphilis occurs spontaneously in man only. Primary and secondary lesions have been produced experimentally in chimpanzees and primary lesions have been produced in some of the lower monkeys. The spirochetes have been cultured in the testicles of rabbits. Gonococcus infection occurs in man only. In artificial cultivation at least the first generation requires human protein. For this purpose, ascitic fluid is commonly used. Influenza occurs in man only. Diphtheria and typhoid fever occur spontaneously in man only.

Many interesting facts with respect to racial immunity have been noted, among which are the susceptibility of the negro to tuberculosis and the fact that whites are more susceptible to yellow fever than blacks. Racial as well as individual immunity is probably a matter of inheritance. It is a matter of the gradual elimination of those who are susceptible and the propagation of the race by the less susceptible, the relatively immune. Direct inheritance of individually acquired immunity is possible, but probably plays a very unimportant rôle. Individual immunity probably depends quite as much as anything upon fortuitous circumstances, such as state of nutrition, metabolic fluctuations, fatigue, and chilling.

Acquired immunity may be classified as active and passive. Active immunity is the resistance attained by the inoculated animal by reason of the activities of its own tissues. It is the result of the physiological reaction occurring as the subject struggles against and overcomes the injected virus, bacteria, or bacterial products. Active immunization may be attained, in general, by an attack of disease, by in-

oculation with unaltered virus of disease in gradually increasing doses, or by inoculation with altered—killed or attenuated—virus. An attack of disease sometimes confers lasting immunity, sometimes very transient immunity, sometimes none. Some of the diseases in which one attack commonly confers lasting immunity are the following: plague, typhoid, cholera, chicken pox, scarlet fever, measles, yellow fever, typhus, mumps, smallpox, diphtheria. Some of the diseases in which one attack confers no lasting immunity are these: infections with the pyogenic cocci, as boils, streptococcus tonsillitis, pneumonia, gonorrhea, influenza, dengue, glanders, recurrent fever, tetanus, erysipelas, malaria, tuberculosis, syphilis. The common "cold" is an excellent example of this group. An ancient Chinese and Indian practice was to inoculate normal healthy individuals with the material from active smallpox pustules. The custom was introduced into Europe in the middle ages and there practised. The practice is dangerous but logical on the reasoning that the disease conveyed to a person in full health would probably take a mild course and confer immunity. This premise, however, is incorrect. It has been the common observation of epidemiologists that run-down condition, undernutrition, exposure, exhaustion due to overwork, labor, loss of sleep, or worry all predispose to infection. Persons thus affected are therefore more apt to contract infectious diseases. Such natural accidental infection is quite different, however, from intentional inoculation. As Victor C. Vaughn has written in a consideration of the protein molecule (1), "typhoid fever kills off the robust and the vigorous, rather than the weak."

In the history of the plague by Thucydides five hundred years B. C., it is recorded that the fairest, the strongest, the most robust furnished the greatest number of victims. One old Irish writer, about three hundred years ago, describing an epidemic of typhus fever, says: 'It went through the country, picking out the strongest, the most robust, just as you or I would go through a flock of sheep picking out the best.' The infectious diseases, like war, kill off the strongest, the most vigorous, the most robust, and, like war, they lead to the deterioration of nations." A similarly rude method of immunization was the early attempt at protection against cholera by the subcutaneous injection of choleraic stool. Such methods are barbaric and are unjustified because of the high mortality incident upon them.

Inoculation with altered—either killed or attenuated—virus is the modern method of induction of artificial active immunity. It was in 1796 that Jenner (4) reported to the Royal Society his experiments in protective vaccination against smallpox. This was the first great advance which bridges the gap between the observations regarding naturally acquired immunity and rational experimental immunization. It had been observed by many before Jenner, that milkmaids and others who became infected with cowpox were thereafter immune to smallpox. Jenner undertook a thorough investigation of the subject and was the first to produce experimental immunization. The present conception is that the virus of smallpox and the virus of cow-

pox are identical, the latter being simply an attenuated form of the former, the attenuation being effected by growth in an animal of another species. There are many other methods of attenuation. Thus, growth at high temperature attenuates the anthrax bacillus; growth in the presence of an excess of oxygen attenuates the organism of chicken cholera; growth in the presence of antiseptics, as phenol 1:600, attenuates the anthrax bacillus; desiccation also attenuates the anthrax bacillus. Attenuation by desiccation is the method employed in the preparation of the virus of rabies or hydrophobia in the Pasteur treatment. The virus may be not alone attenuated, but killed, as it is in the ordinary bacterial "vaccine," so called. The virus itself may not be used, but instead, the soluble products of the virus, as toxin. The toxin may be used unaltered or in combination with antitoxin. Chemical or physical extracts of the virus may be used, as tuberculin. A combination of the virus with its immune serum may be employed, as in the sensitized vaccines or serobacterins. Lastly, an entirely different virus may be employed, as *Bacillus prodigiosus* or *Bacillus pyocyaneus*, for the production of immunity to anthrax.

Passive immunity is conferred by the introduction of already formed immune substances. Thus, antitoxin, as in diphtheria and tetanus; bactericidal bodies, as lytic bodies, as in cholera; endolytic bodies, as in the treatment of Gram positive coccil infections with such a preparation as His's (5) leucocyte extract; mixed and unknown immune bodies, as contained in the serum of recovered patients in poliomyelitis.

Classification of immune bodies.—Antibodies are produced by the fixed tissue elements of the affected animal, infected or injected, as a result of the stimulation of those fixed tissue cells by antigens. An antigen is any substance which when introduced parenterally stimulates the production of substances which are directly antagonistic to itself. Antigens are usually protein in nature. They may be divided into proteins in solution or soluble proteins and formed protein elements. Thus, human serum and egg white are examples of proteins in solution; crystalline egg albumen is a soluble protein; red blood cells, on the other hand, are formed protein elements, as are also bacteria. We may tabulate antigens and their corresponding antibodies as follows:

<i>Soluble proteins:</i>	toxin	antitoxin
	precipitinogen	precipitin
	sensitizingogen	sensitizin
<i>Formed elements:</i>	agglutinogen	agglutinin
	cystolysinogen	cystolysin
	opsoninogen	opsonin

In addition there are the debatable aggressin and its antiaggressin and lastly the omnipresent, universal complement or alexin, an immune body which appears to have no specific antigen but which occurs spontaneously in perfectly normal blood.

Mechanism of immunity.—In 1883 Metchnikoff (6) referred the absorption of dead or foreign corpuscular elements in the bodies of invertebrates to a process of intracellular digestion, carried out by phagocytic cells. He extended his studies of phagocytosis to phenomena of infection. Nuttall (7) in

1888 reported a series of experiments concerning the antibacterial power of the animal body. He reviewed the work which Metchnikoff had reported in 1883-1887, tending to prove the dependence of immunity upon phagocytosis. Nuttall pointed out that bacilli when mixed with blood and other body fluids undergo a morphological degeneration, quite independent of the action of the leucocytes. He demonstrated that a very large proportion of the bacilli so mixed with the body fluids were killed in a relatively short time. Nuttall expressed the opinion that the assertion of Metchnikoff, that the destruction of bacteria in the living body comes to pass exclusively through the activity of phagocytes, stands as unproved in the light of his researches. In 1889 Buchner (8) investigated the bactericidal effect of cell free blood serum. He confirmed the work of Nuttall. In 1890 Buchner and several co-workers (9) reported a series of elaborate investigations concerning the antibacterial action of the blood and blood serum and the nature of the bactericidal substance of the blood. He called the active constituent of the blood "alexin," a word derived from the Greek "alexo," meaning, to ward off. He found it to be thermolabile, being destroyed at 55° C. within one hour. In 1894-95 Pfeiffer (10) demonstrated the development of specific protective substances in the blood of animals inoculated subcutaneously with living or dead cholera spirilla or typhoid bacilli. He showed that when the serum of an immunized animal is mixed with a suspension of the bacteria to which it is immune and the mixture injected into the peritoneal cavity of a non-immunized guinea pig, a peculiar phenomenon occurs. By removing small portions of the fluid from the peritoneal cavity at frequent intervals it is possible to observe the gradual dissolution of the bacteria. The process requires one half hour or less, depending upon the degree of immunity in the animal, the serum of which is employed. This phenomenon, bacteriolysis *in vivo*, has since been called the "Pfeiffer phenomenon."

Bordet (11) showed in 1895 that it is not necessary to employ the peritoneal cavity, but that the reaction might be done in the test tube by combining immune serum, bacteria and the fresh serum from an untreated animal. He showed that such fresh serum, although in itself without effect upon the bacteria, when added to old immune serum which had lost its power through age, activated the immune serum, rendering it again bactericidal. It was thus demonstrated that two substances are necessary to bacteriolysis—a specific substance developed in the blood of an animal by immunization with a particular bacterium, and a nonspecific substance, which is normally present in fresh blood. Bordet (3), Ehrlich (12), and others established the fact that the alexin of Buchner was really a mixture of these two substances. The stable, specific immune body is variously called "antibody" or "sensitizer" or "amboceptor." The labile element, found universally in fresh blood, whether of an immunized animal or of a nonimmunized animal, is called "complement" or "alexin."

Behring (13) wrote in 1892: "Neither deduction nor theorizing can at present decide whether a com-

promise will be found in the future between the two hypotheses, humoral and cellular, or whether the one or the other will be found correct. As yet the opinions of many experimenting bacteriologists are in direct opposition in this respect." The fundamentally important points in the work of Behring, Kitasato, and Wernicke (14) on immunity to diphtheria and tetanus were as follows: The establishment of the fact that animals may be actively immunized with products of bacterial metabolism—true toxins or exotoxins; the discovery that such active immunity was dependent upon specific antibodies formed in the treated animal and circulating freely in the blood; by the transfer of the blood or the blood serum containing these specific antibodies, other normal animals could be passively protected, not prophylactically only, but even after active disease had set in.

Metchnikoff attributed to immune serum the quality of stimulating the leucocytes to increased phagocytosis. Denys and Leclef (15), 1895, came to the conclusion that the serum aided phagocytosis rather by its action on the bacteria than by its influence upon the leucocytes. Wright (16) in 1903 and 1904 determined the direct dependence of phagocytosis upon some substance contained in the blood serum. He proved conclusively that this serum component acts upon the bacteria directly and not upon the leucocytes, is bound by the bacteria, and renders them subject to phagocytosis. The substance is thermolabile, being destroyed at 60° C. in ten to fifteen minutes. He named these bodies "opsonins," from the Greek meaning to prepare.

The humoral and cellular hypotheses are echoes of the past. There is now pretty general agreement in the conception of the fundamentals of the mechanism of immunity. As to the origin of antibodies, Hans Zinsser (17) says: "The tissue cell, as the ultimate functional unit, must of course be looked upon as the source from which originate the various protective constituents of normal and immune sera; and though perhaps unrecognizable by the coarse tests of morphological investigation, it is in the cells that changes must take place primarily when the animal body is subjected to any of the processes spoken of as immunization. The exact location of the antibody forming cells and tissues, in spite of much investigation, is not at all clear, though many data seem to point to the lymphatic organs, the spleen and the bone-marrow as particularly concerned with this process. . . . It is no less likely, however, that similar functions are exerted by the cells of other organs. In fact, it is more than probable that antibodies may be formed anywhere in the body, and that the locality of their production is largely dependent upon the locality in which the antigen is concentrated. . . . That the fixed tissue cells of any part of the body can and do take an active part in the local reaction against the invasion of bacteria and other foreign materials is histologically evident."

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ETHER OIL COLONIC ANESTHESIA.*

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At the meeting of the State Medical Society held at Philadelphia in 1915, the writer presented a paper on *Rectal Anesthesia in Thyroidectomy* and reported 100 cases, and also published a similar report in the *NEW YORK MEDICAL JOURNAL* (1). Since then, with continued use in all cases of goitre surgery and in various other operations when indicated, the number has passed the 600 mark, it seems worth while again to present the subject, in many respects a repetition of the original, except that our method of administration has changed, a smaller quantity being given and better results being obtained. We have held to the method given in this paper for a long time, and believe that if carefully carried out it will prove most satisfactory in all proper cases.

To James T. Gwathmey, of New York, belongs the credit of patiently working out the scheme of ether oil colonic anesthesia, and while the technic has been varied slightly in the effort to get an ideal combination, we have at present adopted the mixture and method of administering, to be described later, which has been eminently satisfactory in our work. Gwathmey gives full credit to Cunningham, of Boston, who first used air as a means of conveying the ether vapor into the intestinal tract, and the early work of Cunningham and Sutton, and their technic helped the originator of the oil ether mixture in the development of his method, and has made our own a success.

The physiological effects of the oil ether mixture is shown soon after its first administration, when it becomes heated to the body temperature, and at this point the ether, or some of it, becomes gas and is rapidly absorbed by the small capillaries of the colon and carried to the general circulation, and is taken through the lungs, where some is excreted, and some is reabsorbed and carried to the brain. We found little or no change in blood pressure. The brain is not deeply narcotized, as in the inhalation method, and the patient regains consciousness rapidly, while the sensation of pain seems to be held in abeyance for some time. The eye reflex is seldom lost, but the relaxation of the general muscular system is complete.

There are four factors acting in harmony, which help maintain an even plane of anesthesia: the constant rate of evaporation of the ether from the oil; the distention of the colon, causing less ether to be

*Read at meeting of the New York and New England Association of Radical Surgeons at New York, November 8, 1917.

absorbed than when only partially distended; the cooling of both mixture and gut, as the ether leaves the oil, which retards elimination and absorption; the difference between the absorptive power of the colon, and the eliminative capacity of the lungs (Gwathmey). This method is very valuable in cases where fear is a prominent element, as in goitre and especially hyperthyroidism, in neurotics, in patients with asthma, and in hernia operations, on such patients as we often see in the coal regions, who suffer with miner's asthma. These individuals sleep peacefully, and have none of the choking or cyanosis seen during the usual administration by inhalation. It is useful in fat patients who have short thick necks and narrow air passages. It is contraindicated in cases of colitis, hemorrhoids, ulcer, or fistula, or when pain is caused by its introduction. We have seen only one case of looseness of the bowels, or irritation, in over 600 administrations.

The postoperative effects are much better than with the usual routine method of ether or chloroform, and postoperative vomiting has been present in less than twelve per cent. of our cases. The patient wakes quickly after the flushing of the colon; is usually comfortable, aside from the unavoidable throat irritation, following goitre surgery; can retain medication or nourishment in most instances, and in abdominal operations there is usually freedom from pain for some time after the patient is returned to bed, although consciousness has been fairly well regained. The technic of administration in our own work is practically as follows: The preliminary treatment consists in administering a laxative, usually calomel or phenolphthalein, the night before operation. This should be followed in the morning by enemas, usually two, an hour apart, using plain warm water or weak suds solution. A special rectal tube one fourth inch in diameter, with eye in the side, should be used and a clamp for the tube should be provided; also a small funnel into which the mixture is poured. Gwathmey has a special tube of his own design for use in these cases. The method of inducing anesthesia which we follow almost invariably is as follows: One hour before the time set for operation the patient is given by rectum one or two drams of paraldehyde, two and one half drams of ether, and one dram of olive oil. These should be thoroughly mixed in a small bottle before administration. Twenty minutes after this is given, a hypodermic of 0.25 grain of morphine and 1/150 grain of atrophine is administered. Then wait twenty minutes and give three ounces of ether thoroughly mixed with one ounce of olive oil. This should be given slowly at the rate of one ounce a minute. The rectal tube should be clamped and left in the rectum until the operation is completed, when the bowel should be carefully and completely irrigated until the solution returns clear and practically free from the ether oil mixture. Any mixture remaining may be helped in its removal by a gentle massage of the colon. A pint of water of a temperature of about 90° F. is then put in the bowel and left there. To illustrate: At 9 a. m. the patient receives the mixture of paraldehyde, ether and olive oil as mentioned above. At 9:20 the hypodermic of morphine and atrophine is

given. At 9:40 the ether in oil mixture is slowly administered as already stated. At ten o'clock the majority of patients are ready for operation.

In the case of an alcoholic, we may omit the preliminary rectal administration given above, and use instead 0.01 grain hyoscine hypodermically two hours before operation, and repeat this with 0.25 grain morphine, one hour before operating, and follow with the oil and ether, as already mentioned. Children under ten or twelve years of age need no preliminary treatment, aside from laxative and enema. It is important not to insert the tube more than five inches within the bowel. The Sims position is the correct one. We have found that where one person has sole charge of this work, the quantity used has been greatly reduced and splendid anesthesia maintained. It is important that the use of ether oil mixture be in the hands of one who can begin its administration, and have it under his or her care in all cases, and not delegated to a different doctor or nurse each time it is used.

Should narcosis be slow, or the patient restless, as will occur now and then, a few whiffs of ether will quickly produce sleep; usually one or two drams is ample, as already mentioned. The breathing, as a rule, is quiet and regular, pulse normal, and reflexes not disturbed. Should there be loss of lid reflex, cyanosis, or stertor, it is an indication to withdraw one or two ounces of the mixture from the colon. Should respiration be arrested, of course, artificial respiration would be indicated, as in any similar condition under inhalation anesthesia and the mixture withdrawn. Doctor Gwathmey has lately experimented with a preliminary mixture of 0.25 grain of morphine, two drams each of bromide of potassium and paraldehyde, and water to make four fluid ounces, injected one hour before operation. This is followed at the proper time by one ounce of a sixty-five per cent. mixture of ether in oil or one ounce to forty pounds of body weight. We have tried this out in a few cases, but have found our own method to be far more satisfactory, and we use it exclusively. Experiments have shown that two drams of paraldehyde used this way seems to equal two ounces of the seventy-five per cent. oil ether mixture; thus the amount of oil ether has been greatly reduced in our experience.

For children, the oil ether should be used in equal parts, as advised by Gwathmey. We have never used it as yet in the young. The fact that you can anesthetize a patient in bed, remove him to the operating room, and perform an operation, without the patient's realizing what has taken place, surely is a feature of this method that must appeal to any surgeon who has to deal with any patient who is nervous, high strung, and apprehensive of danger. Especially is this true in cases of hyperthyroidism or in those who have not yet reached the toxic stage, but are near enough to be exceedingly nervous and depressed. It is of value in conditions such as asthma, where the inhalation method is so often accompanied by choking and cyanosis. In fat subjects with short, thick necks it is well worth trying and most efficient.

The principle of anociassociation can be realized by this method, as far as calmness and the indiffer-

ence of the patient is concerned, and nerve blocking by the use of novocaine, as advocated by Crile, can be carried out if desired. In the nervous type seen in hyperthyroidism, after the usual preliminary treatment by rest and medication, when the time is set for operation and not known by the patient, it is the custom to give each day or second day for a week previous to and leading up to operation an injection of four ounces of water containing a dram of ether, this the patient is told is for tonic purpose and is to be retained. On the day of the operation the patient is given the regular course as already mentioned and the operation is then performed with little if any knowledge on the part of the patient. By this method postoperative nausea is reduced to a minimum, as are gas pains. There is little or no mucus, and the ether is less irritating to the colonic membrane than the vapor is to that of the respiratory tract. The safety limit is extended by the gradual absorption of ether by the colon and its rapid elimination from the lungs.

It is of interest to note that Dr. W. H. Park, of the New York Department of Health, found that an ether in oil mixture killed the colon bacillus in one minute. "As the colon bacillus is an important infective agent postoperatively, the ether oil solution acts as a desirable prophylactic agent against possible infection." We do not advocate this method for general surgical work, as the time required for its proper technic would prohibit it where a number of operations are scheduled, and for routine use we stick to inhalation or to local anesthesia. However, we have operated frequently for hernia and various abdominal conditions, in order to test out the procedure in every way.

For head and neck work, especially goitres, it is our firm belief that it is supreme over any other method, and further, as demonstrated by Gwathmey, the factor of safety is the wide margin between the dosage required for surgical narcosis and that which produces toxemia. When thoroughly mixed before administering, we have a preparation in which each molecule of ether is bound to one of oil, and this union is broken only when vaporization occurs. When anesthesia is established it is automatically maintained by the ether separating from the oil according to well known physical laws, and this vaporization is constant, so that you do not have deep anesthesia at one time and light at another, unless deepened by rebreathing or lightened by an airway tube. The ether and oil should be thoroughly mixed by shaking in a bottle for one minute, as recommended by Lombard.

We have used the ether in oil method continually in all goitre work and after an experience derived from several hundred cases of all varieties of goitre, and over 100 of various abdominal conditions, it is our opinion, to sum up the subject, that:

1. It is most valuable in head and neck operations.
2. It eliminates the fear seen in so many cases.
3. There is less tax on the lungs and kidneys, and nausea and vomiting are greatly reduced.
4. Operations can be done with little or no knowledge on the part of the patient, while Crile's technic can be carried out if desired.

We are indebted to Doctor Gwathmey for introducing a method of anesthesia which is most valuable, and one which if used with proper care and observation will add greatly to the convenience of the surgeon and the comfort of the patient.

NOTE.—Since running this paper, fifty more cases have been added to our number.

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PARAFFIN IN THE EAR AND NOSE.

BY ALFRED KAHN, M. D.,

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For the past year or more liquid paraffin has been used extensively in the dressing of burns and on various skin lesions. The paraffin is heated in an urn and is sprayed by means of air pressure over the surface of the skin. It keeps the parts quite sterile, promotes reparative processes, reduces pain, protects the surface from dust, and prevents friction against the diseased areas. I have recently been using it in and around the ear in various ways.

In the radical mastoid cavity over skin graft the radical cavity is sponged quite dry after all bleeding has been stopped by the free use of adrenalin. The skin graft is then applied to the cavity, following the usual skin graft technic. The cavity is then sealed by a fine spray of paraffin. The paraffin is sprayed over the entire radical cavity. It has the effect of sealing the skin firmly in place and holding it there. It promotes the attachment of the graft to the underlying parts and has the additional advantage that the graft is not in danger of being pulled away when the gauze packing or cotton pledgets are removed. I have used it as a reinforced dressing back of the ear, especially in instances where the mastoid wound or radical incision has recently healed, and where a protective dressing is thought necessary. I have used it in external diseases of the ear, such as skin lesions, frostbites, etc., and in diseases of the auricle and surrounding parts. In cases of skin lesions the parts are thoroughly cleaned and dried and the paraffin sprayed on. I have used it to cover the area on the thigh after removing my skin graft, and in these instances I find it a most excellent covering.

I find it useful in the nose over the incision following nasal septal resection. In two cases this was the only dressing used. The front wound was sealed up with paraffin and the septal flaps reinforced by the paraffin covering.

50 EAST FORTY-SECOND STREET.

Lafora's Sign in Meningitis.—G. G. Urdiales (*Revista de Medicina y Cirugía Práctica*, December 28, 1917) verifies the contention of Rodríguez Lafora that persistent picking of the nose is a very early diagnostic sign in meningitis. The explanation of the symptom is that it is due to an irritation of the trifacial nerve or the Gasserian ganglion, which in turn is due to pressure and intoxication produced by the purulent cerebrospinal fluid and increased intracranial tension.

SURGICAL PROGNOSIS IN GALLBLADDER DISEASE.*

A Study of Postoperative End Results.

By E. MACD. STANTON, M. D., F. A. C. S.,
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What does surgery offer to the patient suffering from gallbladder symptoms? The importance of an unbiased and correct answer to this question can scarcely be overestimated. All of the many problems of judgment associated with gallbladder surgery centre around this answer. Such knowledge must form the basis for the decisions of the patient, the internist, and the surgeon. To the family physician it is particularly important. For him the answer as given by the great surgical clinics is not alone sufficient because it is of more immediate importance that he know the results obtained by the local surgeons to whom he is accustomed to refer his gallbladder patients.

The study upon which this paper is based was undertaken with the purpose of determining my own results in this field of surgery and comparing my results with those reported from other sources. For this purpose I have taken the first 100 consecutive operations performed by me because of symptoms referable to the biliary tract and have studied each case with special reference to the end results. The average time elapsing since the operation in the series I am now reporting is three years and eleven months. The average time during which the patients have been followed to determine the end results is two years and seven months.

I will not attempt to deal at this time with the question of diagnosis. In the series I am now reporting gallstones were present at the time of operation in seventy-two patients. Of the remaining twenty-eight three had cancers involving the biliary tract. One had a benign obstruction of the common duct and twenty-three were cases of cholecystitis. The percentage of cases with stone is higher than most authors report.

Thus the Mayos (1) in 967 gallbladder and ducts in 1914 encountered stones in only sixty-three per cent. Deaver (2) found stones in seventy per cent. of 159 gallbladder operations performed by him in 1914. Undoubtedly the chances for a medical cure are much better in the absence of stones and I have often wished that I could limit my operations almost exclusively to gallstone cases, but the experience of surgeons generally seems to show that stones are to be expected in only about seventy per cent. of the gallbladder cases which seem to require operation.

The first great problem which confronts both the internist and the surgeon in deciding for or against an operation is that of the danger of the operation itself. The more carefully I study this question the more thoroughly I become convinced that gallbladder surgery is only justifiable when we can promise a very low operative mortality.

Before studying the actual surgical mortality it will be well for us to attempt to estimate the maximum mortality which might be theoretically justifiable

and surgery still remain the method of choice for treating disability due to gallbladder disease. This is important because the relation between the actual and what may be called the justifiable mortality must remain the most important single factor in determining our decision for or against operation.

Let us take for example acute appendicitis. The dangers of this disease are very great. According to available data the medical mortality before the days of surgery was between seven and ten per cent. The cure following a successful operation is absolute so that the patient is freed from the dangers of a subsequent attack. I believe, therefore, that we are safe in saying that the maximum justifiable surgical mortality in acute appendicitis is in the neighborhood of ten per cent. It is because the operative mortality equaled or exceeded this rate for many years that the question of the advisability of operating for this condition remained debatable. Cancer of the stomach presents a much more difficult problem. Here the medical mortality is ultimately 100 per cent. If surgery could promise a reasonable period, say three to five years, of health to those who survived the operation, then a very high operative mortality would be theoretically justifiable, although I doubt if any considerable proportion of cancer of the stomach patients would submit to operation during the operable stage of the disease if they were told the whole truth with an anticipated operative mortality over ten or fifteen per cent.

Gallstones are seldom actually fatal. Even the most desperate attacks usually clear up after a time and long periods of relative quiescence are the rule in sixty or seventy per cent. of cases. Surgery greatly reduces the morbidity, but it does not offer 100 per cent. prospects of permanent cure. I believe that an anticipated mortality rate of over four per cent. would deter me from seeking operation myself or advising it in a member of my family. That the operative mortality in gallbladder surgery is not necessarily high has been abundantly proved by the masters in this line of work. Mayo in 4,000 operations reports an average mortality of 2.75 per cent. In 967 operations in 1914 the mortality at the Mayo clinic was only two per cent. My own mortality has been less than three per cent. I am certain that the Mayo reports have led to the popular impression that the mortality in gallbladder surgery is always low, but the available data does not confirm this view. One thousand and fifty-one operations in thirty representative American hospitals during 1908-09 resulted in eighty-seven deaths, or 8.2 per cent. Deaver (3) in 1,031 operations performed between 1910 and 1916 had seventy-four deaths, or 7.2 per cent. Kehr always had a high mortality and attempted to justify his mortality by asserting that only thorough operations cured. In some large series reported by him it was over ten per cent. Following 131 operations on the gallbladder performed in the Ellis Hospital previous to January 1, 1916, there were eleven deaths, or 8.4 per cent. I have dealt somewhat at length on the subject of mortality because I am convinced that gallbladder surgery need not be danger-

*Read before the fourth annual meeting of the Fourth District Branch of the Medical Society of the State of New York, at Amsterdam, August 30, 1917.

cent. Reported operative mortalities of eight per cent. or even higher are too high and are due either to poor technic or bad judgment on the part of the surgeon. A few surgeons of recognized ability aver that their high mortality is due to the desperate cases they are called upon to treat, but a close analysis of their deaths, whenever they are reported, yields convincing proof that most of these deaths are due either to bad judgment as to the time of operation or to unnecessarily prolonged and complicated operative procedures apparently undertaken under the assumption that in these desperate cases only radical surgery is curative.

In the series I am reporting there were three deaths, as follows: The first death was due to anaphylaxis resulting from the injection of fifteen c. c. of sterile rabbit serum given according to the method of Munroe with the hope of controlling hemorrhage in a case of long standing jaundice. This death occurred in 1906, before the development of present day technic for human blood transfusion which has made it no longer necessary to use alien serums to control hemorrhage.

CASE I.—Female; age forty-eight years; referred by Doctor Burke; operated December 31, 1908. The common duct was obstructed associated with jaundice of over three years' duration. There were areas of subcutaneous ecchymosis. A few minutes before beginning the anesthetic this patient was given fifteen c. c. of sterile rabbit serum according to the method of Munroe. Just as the anesthetic was started the previously rather phlegmatic patient became wildly excited, resembling a highly toxic exophthalmic goitre case. Even when under the anesthetic the patient jerked and twitched in semiconvulsive movements. I was not present during the anesthetization or would probably have recognized the symptom-complex. Patient died suddenly on the table a few minutes after commencing the operation. Autopsy showed a single large stone in the retroduodenal portion of the common duct. There was no gross pathology to account for the sudden death. This death was undoubtedly due to anaphylactic shock following the injection of the rabbit's serum.

Two deaths were due to cholangitis, as follows:

CASE II.—Female; age forty years; referred by Doctor Ham; operated February 3, 1910, by another surgeon for abscess in region of gallbladder and pylorus. The general condition of the patient was very bad at this time, and it was not determined whether the abscess was due to gallbladder disease or perforated duodenal ulcer. The abscess was drained; the fistula persisted, and the general condition of patient improved until shortly before second operation, at which time she began to have recurrence of pain with evidences of toxic absorption.

Doctor Stanton performed the second operation December 30, 1910. Twenty stones were found impacted in the gallbladder and cystic duct. Cholecystectomy was done without shock or operative accidents. The patient died in coma four days after the operation. Autopsy showed acute cholangitis with region of operative work in good condition. The condition of this patient demanded the second operation and I do not see how the death could have been avoided.

CASE III.—Female; age thirty-three years; referred by Doctor Johnson; operated October 21, 1912. The patient presented moderate jaundice of twenty-four hours' duration, not improving under medical treatment. Cholecystectomy was done and the ducts were very carefully palpated but no stones were found in the ducts. A number of small stones were removed from gallbladder. Notwithstanding free drainage of bile following the operation, a most intense jaundice developed and the patient died on the third day following operation with symptoms of cholangitis and liver insufficiency. Events showed that it was an error in judgment to have operated at this time. The obstruction was due to cholangitis and swelling of the ducts, and I be-

lieve she would have had a better chance had she been treated conservatively until the jaundice had cleared up.

It is now nearly five years since I have had a death following an operation on the gallbladder. It is interesting to note that there were no deaths in this series due to peritoneal infection, notwithstanding the fact that there were seventeen cases of acute empyema. Operative shock played no part as a factor of danger, and in the entire series there was no technical accident of any kind such as the accidental injury of the common duct, accidental hemorrhage, and injury to the hepatic arteries. I believe that the danger of acute cholangitis and liver insufficiency is one that must be accepted in gallduct surgery just as acute renal insufficiency must be reckoned with in surgery of the prostate, but that before operating in any case in which the danger of cholangitis can be anticipated we should try by all conservative means to carry our patient beyond the period of danger.

The one chief requisite for a low mortality is for the surgeon to make it an absolute rule to play safe in each individual case. This applies both as to the time when the operation is to be performed and the character of the operation to be undertaken. Notwithstanding the formidable pathological changes often found at operation during the period of acute exacerbation of gallstone disease, there is overwhelming clinical evidence to the effect that the acute attack is only very rarely actually dangerous. This fact should always be borne in mind by the surgeon in determining the best time to operate. Emergency operations performed during acute attacks are not, as a rule, lifesaving, and are not justified if a safer operation can be performed during a quiescent period. This does not, however, mean that cases of empyema or common duct obstruction should be allowed to drag on indefinitely. The dangerous storm is usually soon passed and the convalescence can, as a rule, be greatly hastened by operating as early as possible. In this series there were seventeen cases of acute empyema. Two were operated within forty-eight hours of the onset of the acute infection. All of the remaining fifteen were operated after the acute storm had passed. In seven of the fifteen the operation was delayed for from four to nine days after the patients came under my care. There was no mortality in this empyema group.

As regards the operation itself I believe that the difference in the end results between cholecystostomy and cholecystectomy is never great enough to warrant the surgeon choosing to do a dangerous cholecystectomy when he can perform a safe cholecystostomy. If the ordinarily advanced arguments in favor of almost routine cholecystectomy based on infection and injury to the gallbladder are to hold good in any one class of cases it must be in empyema of the gallbladder. One of the best known advocates of radical gallbladder surgery has recently reported operating in sixteen cases of empyema with six deaths, or thirty-eight per cent. mortality. Following sixteen cholecystostomies for empyema performed by myself and followed for periods aggregating twenty-six years and eight months I find twenty years of complete cure

amounting to seventy-four per cent. of the post-operative time of these patients which is better than the average for all cases of either cholecystectomy or cholecystostomy in my series.

Turning now from the question of mortality to that of end results we find that it is quite impossible to express these results in the usual terms of the number of patients "cured," "improved," etc. The reason for this may be illustrated by a typical case.

CASE IV (No. 5).—Male; age forty-five years; typical gallstone attacks for twenty-five years. Cholecystostomy was done November 10, 1908; ducts were found free; 1,675 stones were removed from the gallbladder. Seven years after this operation the patient told me that he had never had a symptom of his old trouble and felt ten years younger than he did before the operation. However, seven years and five months after the operation gallstone colic again developed, accompanied by jaundice which increased in frequency and severity until eight years and four months after the first operation he was again operated and a large stone removed from his common duct.

It is obvious that the only way to state the end results of the first operation in this case is to use some statistical method which will give the first operation credit for a cure extending over seven years and five months after which there was no further benefit from this operation. To date this patient has been traced eight years and five months, eighty-eight per cent. of which time he was cured by the original cholecystostomy.

All of the major difficulties of presenting the end results in these cases disappear if we tabulate the results in terms of the time the patients have been traced following the operation and so stating the results as to give the proportion of the total time passed as "cured," "improved," "unimproved," and "dead." Table II shows the results of tabulating my cases by this method. In ascertaining these end results gallbladder cases naturally fall into five groups: 1, gallstones operated by simple cholecystostomy; 2, gallstones operated with removal of the gallbladder; 3, simple drainage of the gallbladder in cases of so-called cholecystitis; 4, cholecystitis with excision of the gallbladder; 5, operations limited to the relief of common duct obstruction.

Cholecystostomy was the operation performed for gallstones in forty-two cases. These patients have been operated on an average of four years and six months, and have been traced for periods aggregating 121 years and one month, or an average of two years and nine months for each patient. Since their operations the patients in this group have spent seventy-two per cent. of their time entirely free from symptoms referable to the biliary tract. An additional nineteen per cent. of the time these patients have enjoyed greatly improved health varying from almost complete cure to moderately satisfactory recovery, all of the patients themselves feeling well repaid for their operation. Six per cent. of the time is debited as unimproved and the one death occurring in this group accounts for three per cent. of the postoperative time. On the whole the results in this group have been very satisfactory. Even the six per cent. of time charted as unimproved is due to recurrences in five patients who had previously spent an average of two years and five months each cured. Considering each indi-

vidual case separately the results are even more encouraging, for, aside from the one death there was not a single case in which the result was not sufficiently good to justify the operation.

Nevertheless, following these forty-two cholecystostomies for gallstones, six have been reoperated and in three additional cases reoperation has been advised. This means nine out of forty-two, or twenty-one per cent., of reoperations following cholecystostomy. At first glance this is a very strong argument for cholecystectomy, but an analysis of the individual cases does not bear out this snapshot assumption. The following are synopses of the nine cases above mentioned:

CASE V (No. 5).—Operated 1908; cholelithiasis; cholecystostomy. Complete relief for seven and one half years. Then recurrence with choledochotomy for single stone in common duct. Cholecystectomy. Presence of gallbladder aided greatly in locating common duct at second operation and had nothing to do with recurrence of symptoms.

CASE VI (No. 9).—Operated 1907; stones in gallbladder; pelvic peritonitis; perfectly well for five years; then recurrence of stones. Reoperated 1914; stones in gallbladder; cholecystectomy. Relief for one year following second operation, then had recurrence of colic. Probably has now formed stones in common duct.

CASE VII (No. 11).—Operated 1910; one stone; cholecystitis. Six years of relief with occasional gas attacks, probably due to cholecystitis. Advised reoperation in February, 1917, for recurrence of symptoms, but since this advice has had a remission and is now on duty as a naval officer.

CASE VIII (No. 24).—Operated 1910; empyema with peritonitis. Reoperated eight months later for mucous fistula; cholecystectomy. Condition very bad at first operation. Primary cholecystectomy out of the question.

CASE IX (No. 36).—Operated 1911; stones impacted in cystic duct. Operated three weeks after operation for pyosalpinx and pelvic abscess. Patient very fat. Cholecystectomy deemed dangerous. Complete relief for two years, then recurrence of symptoms, which are as yet not severe enough to make patient accept a second operation.

CASE X (No. 38).—Operated 1912; cholelithiasis; cholecystitis; cholecystostomy. Felt fine for one year; then had recurrent attacks, continuing until reoperation 1913. Cholecystitis and pericholecystitis; stricture cystic duct; cholecystectomy.

CASE XI (No. 46).—Operated 1914; empyema with perinephritic abscess and old fistula; condition of patient bad; cholecystectomy too dangerous. Condition now good but has mucous fistula draining through loin. Cholecystectomy would probably cure fistula, but patient is so comfortable she does not desire a further operation.

CASE XII (No. 65).—Operated 1915; empyema of gallbladder; trichinosis; very septic and condition desperate. Cholecystostomy; no effort to remove all of the stones. November 2, 1915, cholecystectomy for persistent fistula due to impacted stones.

CASE XIII (No. 67).—Operated 1915; ten large stones at junction of cystic and common ducts. Cholecystostomy; five months later recurrence of attacks of colic, becoming more severe and finally developed jaundice. July 22, 1916, cholecystoduodenostomy; stricture of common duct. Glad I had saved the gallbladder.

Considering these cases with all the advantages arising from our knowledge of the end results I regret having done a primary cholecystostomy in only two cases, vii and x. Cases vi and ix are debatable, but I believe it was wise to have played safe with the gallbladder operations in both of these cases. The wisdom of the primary cholecystostomy in the remaining five cases is scarcely open to question.

Twenty-eight cholecystectomies for gallstones were operated on an average of three years ago and

have been followed for periods aggregating sixty-four years or two years and four months for each patient. The end results in this group are very satisfactory with seventy-three per cent. of the post-operative time cured, seventeen per cent. improved, three per cent. unimproved, and seven per cent. dead. The one death in this series occurred early in the work, thus increasing unduly the relative time allotted to this column. Likewise the percentage of time allotted to the unimproved column would have been higher had the one unimproved patient been operated a few years earlier. The figures for cured and improved are, I believe, fairly representative.

Studying the results obtained by removing the gallbladder in operations for gallstones case by case, I am, however, struck by the fact that they are not strikingly better than those obtained by cholecystostomy. The knowledge that the gallbladder has been removed eliminates this organ from further responsibility for symptoms and thereby relieves the surgeon from a certain element of mental anxiety which he is liable to suffer when cholecystostomy patients return with symptoms referable to the gallbladder. The fact remains, however, that the same proportion of patients in this cholecystostomy group as in the cholecystectomy group have subsequently developed more or less distressing symptoms unquestionably referable to the biliary tract, and recently four patients who had remained perfectly well for a year or more following this operation have reported typical attacks of biliary colic.

Previously reported studies by me show that actually recorded stone recurrences have occurred in the ducts fully as frequently as in the gallbladder. If, as now seems quite probable, we are compelled to abandon the hypothesis of infection as the cause of gallstones and accept the cholesteroline metabolism hypothesis of Aschoff it is easy to understand this tendency to the recurrence of symptoms in patients whose gallbladders have been removed.

I am quite familiar with the present day arguments for cholecystectomy and recognize the limitations for the small group I am now reporting, but on three previous occasions I have reviewed all of the available actual data on the subject and each

colic was almost always of gallbladder origin, yet patients without gallbladders may have the most terrific attacks of biliary colic unaccompanied by jaundice or other symptoms pointing to common duct obstruction. My records show that this type of recurrence of biliary colic after a year or more of complete relief has occurred in greater or less severity in four of the twenty-eight patients in this series. Three of these recurrences have been of recent date so that they do not materially influence the end result figures but if these patients continue to have attacks the results in the cholecystectomy will be actually inferior to those of the cholecystostomy group. The unimproved column contains one patient in whom colics probably due to an overlooked common duct obstruction commenced a few weeks after a cholecystectomy for a hydrops of the

GALLBLADDER OPERATIONS

TABLE I.

SURGICAL MORTALITY.

	Operations	Deaths	Per cent.
Mayo Clinic	967	23	2.3
DeBakey	1041	74	7.1
St. Paul	1009	1	.1
Florida American Hospital	1064	87	8.2
Twenty-five New York State Hospitals	637	14	2.2
Ellis Hospital	131	27	20.6

gallbladder, and I have several times observed prompt recurrence of this kind in patients operated by other surgeons.

I do not wish by these remarks to carry the impression that I am opposed to cholecystectomy, but I do wish to sound a warning to the effect that cholecystectomy will not protect against present or future common duct obstructions and to emphasize the fact that patients without gallbladders are by no means immune from biliary colic, gas attacks, pain in the region of the liver, and the other symptoms usually referred to the gallbladder.

The next group we will consider is composed of thirteen cholecystostomies for so-called cholecystitis. These operations were performed on an average of seven years and two months ago with no operations of this character performed since 1911. The patients were followed for an average of three years and eleven months and yielded only nineteen per cent. of cures and forty-one per cent. of improve-

TABLE II.

LATE RESULTS FOLLOWING 100 GALLBLADDER OPERATIONS

Diagnosis and operation	Operation	Years	Average years		Cured		Improved		Unimproved		Deaths	
			year operation	Years traced	years traced	Per cent.	Years traced	Per cent.	Years traced	Per cent.	Years traced	Per cent.
Gallstone, -ostomy	42	100 1-12	3 6-12	121 1-12	23 1-12	72	23 1-12	19	7 4-12	6	3 4-12	
Gallstone, -ectomy	28	87 7-12	3	64 1-12	24 4-12	46 9-12	73	19 9-12	17	13 1-12	4	4 9-12
Cholecystitis, -ostomy	13	88 2-12	6 9-12	51	3 1-12	9 9-12	19	21 2-12	41	20	43	0
Cholecystitis, -ectomy	14	20 1-12	1 6-12	16 8-12	1 2-12	1 9-12	6	1 3-12	2	3	18	0
Common duct	3	5 3-12	1 8-12	5 1-12	1 8-12	1						4 1-12
Totals	100	392	3 11-12	257 11-12	2 7-12	68 6-12	66	68 6-12	22 6	13 2-12	12 4	12 2-12

*Number of patients dead: 3.

Expected deaths normal individuals of like age for similar period: 2.4

time I have been led to the conclusion that the *a priori* arguments in favor of cholecystectomy were only in a relatively small measure supported by the facts. The fact must not be overlooked that there is a considerable psychological factor in the argument for cholecystectomy which is not necessarily supported by the cold facts. If a patient is operated for gallstones and after several years of relief there is a recurrence of biliary colic, the conclusion is almost inevitable that the trouble is due to the retained gallbladder. I formerly believed that biliary

ment with forty per cent. unimproved. Previous to 1911 the leading surgeons taught us that simple drainage of the gallbladder would cure so called cholecystitis. In 1910 and 1911 I ascertained the results obtained by Doctor Ochsner and Doctor McMullen and myself in this class of cases and found that they were not satisfactory. Since 1911 I have abandoned attempting to cure these patients by simple drainage of the gallbladder.

Cholecystectomy for cholecystitis comprises a group of fourteen cases operated on an average of

only one year and six months and traced for an average of one year and two months with a record so far showing sixty-two per cent. of the postoperative time spent as cured, twenty per cent. improved, and eighteen per cent. unimproved. This very marked improvement over the previous record for gallbladder operations in the absence of stones is undoubtedly in part due to the removal of the gallbladder, but also it is in part due to a very much better selection of cases and the avoidance of all operative interference unless there was unmistakable evidence pointing to the gallbladder as the cause of the trouble.

Three out of the 100 operations were for common duct obstructions. One patient died of anaphylaxis before the operation was really started. The other two patients have so far remained well. Altogether stones have been found in the common duct in ten per cent. of the gallstone patients operated by myself.

CONCLUSIONS.

1. Provided a low operative mortality can be assumed, the operative treatment of gallstone disease is one of the most satisfactory branches of surgery.

2. There is a decided difference between the results obtained in gallstone cases and in cases of simple cholecystitis without stones so that the results for the two classes of cases should always be tabulated separately.

3. In gallstone cases if, as a result of the operation, all obstructions within the biliary tract are removed cure is almost certain to result. Overlooked stones are probably the most important single cause of uncured patients.

4. Cholecystectomy may have certain advantages over cholecystostomy but cholecystectomy of itself does not protect against the development of common duct stones or obstructions, and in the series here reported a recurrence of typical biliary colics beginning a year or more after the operation has been more frequent after cholecystectomy than after cholecystostomy.

5. In gallstone cases the difference in the end results between cholecystostomy and cholecystectomy is never great enough to warrant attempting a dangerous cholecystectomy if a safe cholecystostomy can be performed.

6. In cholecystitis without stones simple drainage of the gallbladder does not give better results than could probably be secured by medical means.

7. A certain proportion of patients presenting gallbladder symptoms without the presence of stones are cured by cholecystectomy, but disappointments in this field of gallbladder surgery can only be avoided by a very careful selection of cases based on a thorough knowledge of the relation of symptoms and pathology in gallbladder disease.

From a purely statistical viewpoint this series is not large enough to allow of definite conclusions, but taken in conjunction with the results published from other sources we find that the number of cases is sufficient to illustrate most of the problems.

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THE TONSIL PROBLEM IN ADULTS AND CHILDREN.*

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We were formerly taught that if the tonsil projected beyond the pillars of the fauces its removal was necessary. The organ was more or less incompletely removed by a tonsillotomy and the operation was called a tonsillotomy. The result of this operation in many cases was very unsatisfactory because frequently a remaining portion of tonsil hypertrophied and necessitated subsequent operation. Many of these patients suffered more after than before operation, due to the formation of scar tissue which tended to obstruct the crypts and interfere with proper drainage.

As medical science advanced, it was soon realized that a tonsillotomy was very inefficient for the smaller submerged tonsils which we now know are the cause of many systemic disturbances. Among the more common ascribed to tonsillar infection are acute or chronic arthritis, cardiovascular degenerations, acute or chronic nephritis, certain forms of neuritis, simple and tuberculous adenitis, and chronic toxemia. We have abundant clinical evidence to prove that the faucial tonsils are the seat of important chronic foci from which systemic disturbances may take place. It must be remembered that the faucial tonsils are only a part of the lymphoid structures of the pharynx and that systemic disorders may occur by the passage of microorganisms through the mucous membrane of the nose and throat.

In order that you may more clearly understand the pharynx as a source of these focal infections, I would recall the arrangement of the lymphoid tissues in this region: the faucial tonsils, globular masses of lymphoid tissue, situated between the anterior and posterior pillars of the fauces, on either side of the oropharynx; the mass of lymphoid tissue at the roof of the nasopharynx, commonly called adenoids; the lingual tonsil, also masses of lymphoid tissue, situated at the base of the tongue, on either side of the median line; and, the lymphatic nodules on the posterior and lateral walls of the pharynx. The group of tonsils above described go to make up the so called Waldeyer's ring. In regard to the function of this ring, I think it fair to say, from our present knowledge, that it acts as a protective agent to the respiratory tract during early childhood.

All tonsils, when carefully examined bacteriologically, are found to contain a great variety of microorganisms. These bacteria are undoubtedly harmless in the great majority of cases. When the tonsils become diseased, however, they are apt to pass into the lymph stream and cause disorders in various parts of the body. The organism most frequently found in the tonsillar crypts of patients suffering from various systemic disorders is *Streptococcus viridans*. Some observers state that the fau-

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cial tonsils act as the most frequent portals of entry for the tubercle bacillus. The tonsils are also considered the main portals of entry for the infections which follow contamination of the mouth with soiled hands, toys, infected food, milk, or water. That the tonsils have been suggested as the atrium of infection in poliomyelitis is well known.

Diseased tonsils may be caused by repeated attacks of acute tonsillitis, or they may become secondarily infected, as a result of long standing cases of pyorrhea, carries of the teeth, infected nasal sinuses, bad ears, or marked nasal obstruction. In each of the above conditions the pharynx is constantly bathed by infected discharges. If the tonsils are diseased as a result of secondary infection, it is important to remember that the primary source or focus of infection must first be attended to before removing the tonsils. In the recognition of these infected tonsils, the history is often very suggestive and helpful. A history of tonsillitis just before or after the beginning of the systemic disorder is very significant and points clearly to the tonsils as the source of the trouble. Very often these patients will only give a history of repeated attacks of sore throat or quinsy in the past. On the other hand, the history may be more or less indefinite or even negative when a careful examination of the throat will reveal evidence of disease. Many infected tonsils show no evidence of disease upon examination, and only during or after an operation for their removal is pus found at the base of such tonsils. It is important to remember, also, that grave systemic disorders may exist without any demonstrable lesion in the tonsils.

The tonsils, upon examination, may or may not be found to be enlarged. A great many of these infected tonsils belong to the so called buried or submerged type. This type of tonsil is often considered small upon casual examination, but it may be pulled out and made to appear more prominent in the throat; this can be done easily by making the patient gag. These tonsils generally show some evidence of infection, especially along the margin of the anterior pillar, and there are often masses of rotten cheesy material in the crypts of the tonsil. These masses can be expressed by pressure with a tongue depressor at the base of the tonsil. The tonsil is very often bound down by adhesions in such cases. Many of these tonsils look small and shrunken not only as a result of disease, but also of improper or imperfect attempts at removal, and the use of astringents or the electric cautery. There is a new formation of scar tissue which has a tendency to obstruct the crypts and interfere with proper drainage; hence the great importance of a thorough removal of the tonsils or focus of infection in all these cases. The lymph glands at the angle of the jaw will be found enlarged or tender in nearly all cases where the tonsils are the seat of infection; this is an important diagnostic point because it proves the absorption of septic material into the circulation. Before we can say definitely that a given systemic infection is of tonsillar origin, other well known sources of infection must first be excluded, such as the teeth and gums, the gastrointestinal and genitourinary systems, the nasal ac-

cessory sinuses, and the ears. This investigation can be more thoroughly carried out by the internist rather than by the throat specialist; there should be, however, more cooperation between the internist and throat specialist in this class of cases.

So much has been said and written about the ill effects of enlarged tonsils and adenoids in children, that I am sure all are thoroughly familiar with them. It may not be amiss, however, to say a few words about the indications for their removal. It is often very difficult to determine clinically when tonsils and adenoids are enlarged. The normal tonsil of childhood is probably much larger than we have supposed. I believe it is well to look upon their slight hypertrophy as normal or physiological and should recommend their removal only when they produce symptoms. One of the most important indications for the removal of tonsils and adenoids in children is frequent attacks of otitis media. As you know, children with enlarged tonsils and adenoids are very susceptible to such attacks. It is said that at least seventy-five per cent. of deaf adults owe the origin of their trouble to neglected tonsils and adenoids in childhood.

Before concluding, a few practical remarks about the surgery of the tonsils may be of interest. Tonsillectomy is a major operation and should therefore be done in a hospital. It may be performed under local or general anesthesia. In children, general anesthesia is always employed. In adults, we find local anesthesia satisfactory in the great majority of cases. In a local tonsillectomy mild anesthesia of the entire throat is first produced by several applications of a four per cent. solution of cocaine. This is followed by the injection of a few drops of 0.1 per cent. solution of cocaine, mixed with a few drops of adrenalin solution, into the anterior and posterior pillars of the fauces and at the base of the tonsil. The upright position in an ordinary chair is employed. The tonsil is removed by sharp dissection with a pair of right angle scissors. If the dissection is made close to the capsule of the tonsil there is very little bleeding, as a rule, in this type of operation, unless the larger bloodvessels are injured in the deeper surrounding tissues. In children, a modified Sluder operation with the Demarest instrument has worked well in our hands. Many laryngologists have condemned this operation because they may have failed to learn the proper technique for its performance. In skilled hands we believe it is a perfectly safe and efficient operation. No matter what method of operation is employed it is important to remove the tonsil quickly, without much loss of blood, and without much damage to the surrounding tissues.

As soon as the tonsil is removed a gauze sponge in the end of a sponge holder is introduced in the tonsillar fossa and firm pressure kept up for a few minutes until all the hemorrhage ceases. It is always a good rule to control the tonsillar bleeding before removing the adenoids. The tonsillar fossa should be perfectly dry before the patient leaves the operating table. If pressure does not control the bleeding it is necessary to find the bleeding vessel and grasp it with an artery forceps. Very rarely it is necessary to ligate a bleeding vessel. In a case

operated upon at the Williamsburg Hospital recently, it was necessary for the writer to suture the faucial pillars temporarily over a spherical plug of gauze in order to control the hemorrhage. Hemophilia should always be suspected after tonsillectomy if pressure, artery clamps, or suturing the pillars fail to stop the bleeding in any given case. In a hemophilic who was unfortunately operated upon at the Post-Graduate Hospital last summer in the service of Prof. T. J. Harris an injection of thirty c. c. of human serum, obtained at the laboratories of the New York Lying-in Hospital, promptly stopped the bleeding. If human serum cannot be obtained fresh rabbit serum or diphtheria antitoxin may be used. It is a good rule to take the coagulation time of the blood in every doubtful case, and if it is found to be above five minutes, it should be reduced by proper treatment; calcium lactate ten to thirty grains three times daily or the subcutaneous injection of serum is recommended. The postoperative results of tonsillectomy in the great majority of cases are really wonderful, and I believe the operation is here to stay in spite of the fact that it is condemned by some physicians.

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SEX IN LIFE.

The Relation of Sex Education to Mental Hygiene.

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To venereal disease, prostitution, illegitimacy, and sexual vice and crime in general, indiscriminate mating, and uncontrolled breeding of degenerate stock, the demands of mental hygiene have now been added as urgent reasons for giving the individual a proper training in sexual life—not the hygiene concerned with the prevention of syphilitic brain disease, but that which aims at the prophylaxis of the functional psychoses and the psychoneuroses. This is one of the results of the employment of the newer methods of dealing with mental disease problems. The study of mental disorders has, furthermore, given us a new insight into the significance of sex in the life of the individual, and hence has modified our conception of what must constitute a satisfactory system of sex education.

The problem of sex in human life has for a long time been approached from the standpoint of physical science. Our whole sexual philosophy has been distinctly colored as a consequence of this. Studies made from this standpoint have furnished us with certain contributions that have become fixtures in our lives, basic propositions from which well established social and ethical doctrine has been derived.

We have been long familiar with the proposition that sexual intercourse is not necessary for bodily health, and that sexuality, being for the purpose of reproduction and perpetuation of the species, is not of importance for the life of the individual. As puberty is the time when the impulse to sexual intercourse first definitely appears, the period of adolescence following is naturally the time to see that

the sex impulse is not diverted from its natural purpose. Adolescence, then, is the great time for training in sex hygiene. But if sexual intercourse is not necessary in the individual's physical life what can be said of it in regard to his psychic life? The exercise of the sexual organs is not essential to bodily health. What is there to indicate to us whether or not sexual experience has any important relation to mental health? The mentality, as well as the body of the youth, undergoes profound changes during adolescence.

Observations and investigations tending to show that certain abnormal mental conditions are due to the direct organic influence on the brain of the functioning of the genitals, have demonstrated that no very comprehensive explanation of psychosexual life can be obtained by working along those lines. On the other hand, the genetic psychological approach to the problem immediately provides us with a path to the inner nature of it. The unity of the individual then reveals itself as the thing directly involved. Evidence derived from a study of mental disease confirms this.

The experiences that have the most profound effects in our lives are those bearing on these biological processes. These phenomena cannot be explained apart from the history of the individual organism. We are here in the presence of nascent impulses springing out of the past. As Bergson (1) says, "It has often been pointed out that most instincts are only the continuance, or rather the consummation, of the work of organization itself." If we study changes in development, such, for instance, as occur in adolescence, they are only understood in the light of the whole process with which they are continuous. It is thus that we must view our instincts, the driving force of our mental life, and especially the sex instinct. The unity of the individual is the normal goal of his process of organization and of the tendencies arising out of that organization, and of the psychical elaboration of the experiences based upon those tendencies. How we dispose of our experiences, in particular our sexual experiences, means much potentially for our psychical integrity. The nature of the sexual problem, at least from the standpoint of mental health, is not adequately indicated by stating it in terms of gratification or non-gratification of the sexual appetite, but by stating it in terms which refer to the way in which the individual deals with experiences of a sexual nature, acceptable or otherwise, and whether involving organic phenomena or not.

No one escapes sexual experiences of some kind. If such experiences are not to become a menace to the unity of the normal individual they must be disposed of by a process that corresponds in nature to what Freud, in the case of psychotic persons, has termed *abreaction*, and which, in the normal person, for want of a better term, may be called *celebration*. Experiences that are not digested in this way after they have been gone through, and that are promptly suppressed, are not properly assimilated to the rest of the life of the individual. This is a perfectly consistent consequence, from one standpoint. If sexual activity is only for purposes of reproduction and is unessential for the life of the individual, there

is theoretically no reason for the individual having his sexual experiences woven into the rest of his life. Yet suppressing experiences that have been lived through does not eliminate them. If some great crisis or severe strain occurs in the individual's life, if some situation develops that requires him to make an extensive readjustment, unassimilated sexual experiences in his life are found to have assumed an organization of their own that conflicts with the requirements of the situation and that cannot participate in any new adaption that is demanded of the individual as a whole. This failure of adjustment may express itself in the form of a psychosis.

If we are to show proper consideration for the mental health of the individual in our attempts to train his sex life we must be guided by what we have learned about sexuality in the analyses of cases of mental disease. It is evident that if we are to train the youth to deal with his sexuality at all, we must train him to deal with it completely and in its totality. Half measures are worse than useless. Practically the same psychological effect is produced by the teaching that divides sexuality into an essential and a nonessential part as is more commonly produced by the teaching that divides life essentially into a sexual and nonsexual part. The youth is liable to deal with his personal sex problem as he observes his teacher deal with the sex problem in general. A biased mental attitude, failure to meet actualities fairly and squarely, incomplete and inadequate disposal of fundamental issues, a sophistical and hypocritical spirit—all such things that render impossible a symmetrical assimilation of sex experience and tend to promote its sequestration, must not be given any encouragement in the life of the youth by the training he receives.

The youth will find no healthy compensation for incomplete dealing with sex matters, by attempts to picture himself, in so doing, as occupying a place in an ideal scheme of things. His contact with reality, so necessary for a well balanced mental life, is not improved in this way. The duality created in the individual's life—this forced division of unitary reality into parts which, although interpenetrating, are treated as independent wholes—reappears in the impression given him of sexual values in the life of the social organism. If, as far as it concerns sexuality, he obtains a picture of society as an ideal scheme of things, it is because he has been given only a partial view of society. Organized life in society, as it is at present constituted, has its malignant sexual features as inherently a part of it as its benign ones. The youth is ordinarily liable to have the first thrust upon him before he discovers the second. Commending the sexual virtues of our social system to him does not prepare him to guard against its corresponding vicious features. If allowed to form a conception of society that does not include its sexual vices, he will be constantly at a loss as he encounters evidence of these vices, to find a place for them in his scheme of life, and as constantly engaged in trying to dispel the conflict which the existence of these incongruous elements makes him aware of. The sexual training that insidiously places the youth in a false attitude toward reality in himself and in the world of which he is a part, is

a vicious training. Health of mind lies in something quite different. Stewart Paton (2), in a recent article on mental hygiene, indicates the direction in which the first steps toward the preservation of mental health must be taken when he says, "Let us begin by facing the world, not as we imagine it to be in our dreams nor hope it may become, but as it is today."

The two pamphlets (3) of which the present article is a study are essentially two parts of a single contribution to the literature of sex education. The first one of the two was awarded a prize of \$1,000 by a large insurance company, through a social hygiene association of national scope, for the best original pamphlet on sex hygiene for adolescents of both sexes between the ages of twelve and sixteen years. A committee of judges selected by the association approved the pamphlet out of an entry list of 541 manuscripts. A large field of writers was drawn upon to provide manuscripts for this competition. The prize winning writing may, therefore, be fairly regarded as representative of the best class of this phase of the work in the sex hygiene field. They are selected for analysis for this reason.

The first pamphlet introduces the subject to the youth by informing him why reticence is proper regarding the beginnings of life; it is a sacred matter and difficult to understand before marriage and having given birth to a child. Then it is explained that entering adolescence is beginning preparation for manhood and womanhood, the physical requirements of adolescence are referred to, and the youth is informed concerning the appearance of the secondary sexual characteristics, and menstruation and seminal emissions. He is further warned to expect difficulties associated with these changes, and urged to accept them as sacrifices for future advantages. He is given rules pertaining to health referring to food, exercise, sleep, clothing, tobacco, constipation, cleanliness, and care of the genitals. The penalty for breaking the rules of health is next dealt with, and revealed as nervousness. The importance of a good physical foundation for life is emphasized. But, it is explained, the rules of health are not to be followed for the sake of health, but in order to be in condition to play one's part in serving the great purpose of the world. The world's great purpose is the creation of life. Animals serve this great purpose unconsciously by following their instincts. Human beings learn this purpose and follow it from choice. It is this, and not instinct, that provides the conditions for love, the high symbol of which is sexual intercourse.

The second pamphlet treats of the development of the mind and will. Great importance is attached to the training of the character by the constant exercise of the fine qualities desired in the character. For in this way the mind is made fit for the exercise of the qualities of manhood and womanhood. It does not do to have the body developed without the mind also being developed. The youth is warned that indulgence in immature expressions of sexuality destroys the freshness of the body and mind. Purity in the girl consists in her saving herself for her husband—keeping her

mind as well as her body fresh. Infatuation, flirtations with their maudlin caresses and foolish sentiment, mean that the girl lets some one steal what belongs to her husband. As purity is the great treasure the woman saves for her husband, and as no man should be willing to accept a greater treasure than he can give, so the man must have kept his body and mind strong and pure for her.

Both the boy and the girl have a special difficulty of bodily organization to overcome. The girl sometimes suffers nervous and physical strain each month, and perhaps this is so that she may be prepared for the anguish of childbirth. The boy's difficulty is peculiar in that while what a little girl, being protected from vicious people, is told regarding her sex life is at least true, the boy meets many vicious people who will talk to him of sexual things but never tell him the truth. They tell the boy that sexual purity is unhealthy for a boy or man. In reality exercise of the sexual organs is not necessary for health. When the seminal fluid is not used for the purpose of procreation it is absorbed and used for the development of the body, the excess being discharged as a seminal emission. In fact the loss of the fluid before maturity is harmful and weakening. Man needs to satisfy his sexual appetite only for the sake of continuing the race. The intensity of the sexual appetite is not a sign of manliness or virility. A man's strength is measured by the strength with which he controls his desires. The desire in a woman for love, the desire to create new life, which is what sexual desire means, is as strong as the same desire in a man.

If the boy has believed that his health demanded that he should lose seminal fluid, he may have formed a bad habit which may weaken him in many ways. Again, performance of a certain vile act is still worse than believing sexual lies. This act is so vile and cowardly that no man or boy in first class condition would ever do it. The penalties of this vile act are gonorrhea and syphilis. A description is furnished of the nature of these diseases and their consequences, not only to the patient, but to women and children and society in general. But safety from venereal disease is valueless without honor. Debasement of the body in a dishonorable act would be just as vile if there were no such diseases as gonorrhea and syphilis. Fear of disease is only a coward's reason for keeping his body clean. And debasing the mind is as vile as debasing the body. Men and women can take no pride in not having dishonored their bodies, if they have allowed their minds to be filled with foul thoughts and desires for shameful things. No real man, then, can ask a woman to accept from him less than he would demand of her. Even if a man does not lie to his wife about old thoughts and acts of shame that have occurred in his life before marriage, the memories of them will forever stain the sweetest moments of married life for both of them, and be an irremediable impediment to a perfect marriage.

It is to be observed that these pamphlets are typical of the class of literature to which they belong. There is nothing unique about them as far

as they are the subject of a critical study here. The present article is an attempt to indicate the direction in which any efforts towards a solution of the sex hygiene problem must be exerted if the question of mental health is to receive serious consideration. It does not assume to offer any solution of the problem. It is an attempt to show something of the real nature of the problem, towards the one sided solving of which are directed so many sex educational pamphlets. It cannot be denied that because of a misconception of the nature of the problem, much fruitless effort has been expended in that direction, to say nothing of harm done the individual. Blind acceptance of theory has hindered for a long time development of proper treatment of the subject.

In beginning to instruct a person the first thing we do, naturally, is to ascertain what the person already knows and has experienced. In dealing with children just entering adolescence, however, we know beforehand that in general their sexual interests and knowledge have been to a large extent limited by nature to the generic physiological and organic aspects of sexuality. Hence we are enabled, with them, to attain a degree of adaptation for sex hygiene pamphlets that we could not reach in adults whose sex life had crystallized into more individual phases. Yet even the material of this preadolescent period offers all too great an opportunity for perversion of the truth. The authors seem to recognize this at the beginning, and one of their initial difficulties seems to have been the problem of introducing the subject to those adolescents about whose previous sexual knowledge and mental attitude nothing definite can be known in advance.

The youth should be told the actual truth firmly and frankly. There should be no uncertainty and ambiguity about the teachings, no hovering about the subject without ever coming to the point. Otherwise the youth will surely obtain the impression of insincerity and lack of earnestness on the part of the teacher, and the corresponding impression of being trifled with. The average adolescent has already been initiated into the world of sexual falsity. As a little child, he has been taught the shamefulness of his sexual parts and has learned the fabulous account of the origin of babies. It, therefore, behooves the teacher who would make a convincing impression on the youth and deserve his confidence, to come to him with no more material tainted with pretense and obscurity.

The authors begin their work by acknowledging to the youth that he had been deceived in his first sexual lessons, and, as if by way of correcting any possible still existing ignorance regarding physical reproduction, they give a brief outline of it. But, strange to say, it is now explained to the youth that he was not told the truth at first because it would be so very difficult for him to understand; this, when the authors declare that "the child will assimilate only that for which it is ready." Then the pamphlet proceeds to inform the youth why reticence is to be continued. He is told that life itself—presumably sexual life—can be learned only by living it, and that he "cannot really understand

the beautiful truths of a baby's creation," and, of course, the sexual phenomena that bring it about, until he has married. After this, one might naturally wonder what excuse the pamphlet has in going any further. The main object of the pamphlets being to instruct the youth in the essentials of sexual life as it appeals to one during adolescence, it seems a strangely inconsistent course to take to tell him that reticence must be maintained, and that he must wait until he is married before receiving this instruction and then find out things for himself. The adolescent is entering the period when the matter of marriage first begins to arouse serious interest and when, therefore, he begins to plan his life in some way or other in regard to it. Now he is informed that the impulses he begins to feel arising in himself must wait for marriage before he can receive an explanation of them and allow them to become manifest, and he is urged to order his life accordingly.

Marriage, however, is not a thing that comes spontaneously to every one in the course of life as, for instance, puberty comes. Material circumstances, among other things, may prevent or long postpone it. The youth, nevertheless, has a sexual impulse to deal with and, as we know, it may well lead him into indulgence before marriage and without marriage. Are we to abandon those who, for some reason or another, see only a single life ahead of them? Surely sex hygiene is not something which properly concerns itself solely with persons who have good prospects of getting married. And so, not only should the youth be informed sufficiently beforehand concerning what he expects to begin when married, but he should also be given instruction about what he is liable to do in sexual life before marriage. We must first of all prepare the youth to deal with actual conditions, no matter what may be our conception of ideal ones. We must not make the mistake of giving the youth instructions solely as to how to live his sexual life under Utopian conditions that we are convinced ought to exist, or that we delude ourselves into believing do exist in something more than potential form. We can tell the youth what we strive for and what is considered most desirable in sexual relations, but such ideals must not be impossible on the basis of biological facts, and must not be offered as if already in actual existence. We must not describe things as occurring in one way and then have the youth go and find things actually quite different. The obvious discrepancy between actualities and what, in sexual life, is considered what ought to be becomes, in the mind, one of the most prolific sources of hypocrisy. The greatest hindrance to the progress of sexual instruction has been the initial difficulty of telling the truth. The youth should first be told how things actually are, and then, if necessary, how things should be.

Inconsistency, and with it the implication of insincerity, has been the bane of sexual education. The youth naturally wonders at the teacher who prepares to say something and then fumbles around without coming to the point and makes excuses for not saying it. The natural impression produced is that sexuality is a thing of most exceptional kind,

and that it is not to be dealt with as an ordinary feature of life. This is the very thing we wish most to combat in sexual education. It is well recognized that we must not treat sexuality as separate from the rest of life. These pamphlets seem unable to escape this defect, and they are fatally weakened because of it. It is shown more especially in the use of a technical vocabulary of foreign derivation in referring to common sexual phenomena, and by unduly exalting sexuality above other aspects of life in extravagant and glorifying phrases, and by suggesting that sexual activity, in contradistinction to all other normal life activities, plays no essential part in the biological maintenance of the individual, but, even like death, pertains to and has its meaning in something outside the individual.

The authors declare that one of the two main purposes of the pamphlets is to give the child a decent vocabulary for sexual ideas that are usually conveyed in smut. The need of clear and dignified language in which to discuss sexual matters with naturalness and without constraint has been one of the greatest needs of sex hygiene. It is most regrettable that so many of the simple expressive old English words of this kind, best adapted to our tongue, have become vulgarized and indecent, and thus rendered unfit to use. The application of strange sounding foreign terms to the most native and personal things in our life, our bodily parts and processes, is almost as much to be deplored. Nothing could do more to oppose sexuality to the rest of life. If sexuality is one with life how is it, it may be asked, that we can speak in common English about "eating" and "breathing" and "sleeping," but when it comes to describing sexual processes we very consciously make use of such terms as "menstruation" and "intercourse" and "emission?" How is it that we easily speak of "mouth" and "hand" and "leg," but when we speak of sexual parts we must use the Latin words of technical science?

Although the youth may not ask these questions the difference must be apparent to his mind as are the clumsy words inapt to his mouth and ears. Little wonder if the whole thing appears to the youth as affectation and falsity. We know what the natural feeling is toward the type of person who believes it always necessary to call a leg a "limb." And what excuse is there in these pamphlets for substituting the term "uterus" for "womb?" That familiar Anglo-Saxon word has yet escaped being made smutty. All essentially English sexual terms have not become vulgarized, although not in common use. Finally, it seems it would be better to attempt to retrieve the native words of our tongue that have become obscene, just as we are trying to restore from the category of obscenity the sexual actualities which they stand for, rather than to keep adopting substitute terms.

Like fault can be found with the authors' language in general when dealing with specific sexual features of life. It seems to be the rule in pedagogical practice to treat sexuality either as too low and degraded, or else as too high and sacred for free and definite discussion. In either case we

have sexuality made an exceptional thing to life in general. The result of this method can only be harmful. These pamphlets avoid direct treatment of the sexual act by declaring it too holy to discuss. They refer to it as "called by the beautiful word intercourse." The most reasonable excuse for the introduction of this term is that it enables one to pass readily from the idea of physical union to the notion of spiritual communion. But the child in early adolescence is not ready to appreciate the true spiritual aspect of the biological experience described to him as "intercourse." And the word itself is not beautiful. It is clumsy, inexpressive, and ambiguous, and it beclouds rather than elucidates the thing it is used to describe. The use of equivocal terms is an ancient method of clothing a thing in obscurity and avoiding direct contact with it. It again only leads, in the youth, to a sense of falsity. The same may be said of such extravagant expressions as that sex is "too holy for easy discussion," that sexual relations are "holy beautiful" parts of people's lives, and that "love is one of the holy sacred parts of life which you cannot be told about but must learn for yourself." What must be the impression of the youth who reads these things and who at the same time sees, in the daily life of the real world, the manifestations of sexuality treated as indecent and disgusting by the press and the courts and in the conversation of adults, and in the lives of people in general commonly regarded as criminal. If sexuality is sacred, why not all of life in the same degree?

This inherent tendency towards inconsistency and falsification, so common in sex hygiene educational literature, appears in rather crude and elementary form when the authors come to describe simple anatomical and physiological sexual phenomena. Here we seem to encounter the old device of corrupting biological facts for the purpose of supporting some preconceived or favored ethical system, a practice that reminds one of the methods of the charlatan genitourinary specialist who distorts and falsifies biological facts for more material purposes. The old familiar doctrines of a long passed period of medical science, so long the weapons of what might be called the Terrorist school of sexual ethics, are here revived in such erroneous and misleading statements as the following: "The new force which develops in a boy, the seminal fluid, is needed for his proper growth throughout his adolescence. This fluid is formed in its special organs, is distributed throughout the body, and is absorbed and used by both mind and body. Any act which causes this fluid to be lost during adolescence is harmful and weakening. Nature provides that any excess fluid which may form, shall be given off by an involuntary nocturnal emission. . . . The fact is that the seminal fluid is used whether the sexual act is performed or not. If it is not used to create new life, it is absorbed and used by the man's own body." Who would be surprised, after this, if the youth asked how a woman can get along without some sort of seminal fluid? Who could then blame the credulous youth if, altruistically

disregarding the serious consequences to his own health, he attempted to provide such necessary seminal fluid for some favorite member of the opposite sex, especially if he observed indications that he himself was suffering from an excess of this fluid? And may he not have learned of the not uncommon belief that a woman's health is often improved after beginning sexual life?

The youth is further informed: "The loss of this fluid before maturity weakens a boy's health; the loss of it after maturity is not necessary for physical health." He is also told: "In the girls, the organs of sex are situated entirely within the body." Finally, in regard to the sexual act, the youth is taught: "To perform this act except in honor and love, is to defile the body, to fill the mind with foul memories, and to lose forever the hope of experiencing the best in manhood and womanhood." This truly impresses one as peculiarly resembling the description of the fateful nature and consequences of masturbation, formerly playing a more conspicuous part in the teaching of sexual morals to the youth. To hear a young man or woman, to whom had come some such sexual experiences, later repeating such sentiments regarding his or her own body and mind and life, would ordinarily be enough to make one strongly suspicious that the young person had a morbid disposition. It should not be without meaning to the teacher of sex hygiene that this note of fatalism and hopelessness, often enough combined, in the male, with ideas concerning the destructive effect of seminal losses on the mental and physical health, frequently runs through the sentiments regarding their past sexual lives commonly expressed by persons with certain forms of mental disorder.

Sexuality is not a thing apart from the other features of life. Man's erotic nature is not normally held in abeyance by nature from birth, without any preliminary manifestations, until maturity is reached, to then spring forth fully developed in all its aspects. It has its elementary and intermediate stages of development just as have other biological features of the organism. Sex life in the individual, just as in the history of the species, passes through several evolutionary stages, each one of which has its more or less characteristic legitimate manifestations. We can only regard these manifestations as vicious when the individual's development becomes arrested in one of these preliminary stages, or, after maturity is reached, there is a pathological regression of sex life to some lower sexual level.

With the advent of adolescence the youth's sex consciousness becomes more acute, and the impulse towards sexual relations with the opposite sex more and more definitely asserts itself. This is the central fact of adolescence, and it is at the heart of the problem of sex hygiene.

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(To be continued.)

Our Readers' Monthly Prize Discussions

Twenty-five Dollars Is Awarded for the Most Satisfactory Paper

All persons, whether subscribers or not, are invited to compete for the prize of \$25 offered for the reply deemed best by the editors to the following questions:

CXCII.—How do you treat whooping cough? (Closed.)

CXCIII (and last).—What kind of feet must a soldier have? (Answers due not later than April 15th.)

These competitions, which have now been running some fifteen years, will henceforth be discontinued, as a very wide field of medicine has now been covered and the exigencies of war necessitate economy in space.—EDITOR.

The award will be based solely on the value of the information contained in the answer. No importance will be attached to literary style. Answers should preferably contain not more than six hundred words, and should be written on one side of the paper only. All papers submitted become the property of the JOURNAL, and should bear the full name and address of the author for publication. The prize will not be awarded to the same person more than once within a year.

The prize of \$25 for the best answer to Question CXCII has been awarded to E. P. Hershey, C. E., M. D., of Denver Colo., whose paper appeared on page 645.

PRIZE QUESTION NO. CXCII. THE TREATMENT OF LOBAR PNEUMONIA.

(Continued from page 647.)

Dr. Alfred Gumbiner, of New York, says:

There are three ways of combating lobar pneumonia: Through hygiene, through medicine, and through vaccines. The first two are always indicated, the last is a supporting measure in desperately toxic cases. The hygienic measures include the prophylactic stage where careful living, including total abstinence, proper amount of sleep and rest, abundance of fresh air and suitable exercise, by bolstering up the bodily resistance stave off the disease. Let the patient be placed in a room with a southern exposure, if possible, the room temperature to vary between 65° and 70° F., depending on the comfort of the patient. The bed covering should be light and a flannel night gown worn. Chilliness is treated with hot water bags applied to the body. Exclude visitors so as to permit of frequent dozing and conservation of strength. Use antiseptics in the disposal of all excreta. Practice oral antiseptics with boracic acid solution gently sprayed as far back as the tonsillar region, being careful not to excite reflex cough.

Medicinally the initial drug is one tenth grain of calomel every fifteen minutes for ten doses, followed up by a saline cathartic. Then treat expectantly. Watch the signposts of danger—pulse, respiration, and urine.

The character of the pulse should determine the kind and nature of stimulation: (a) if full, strong, bounding, give one minim of tincture of aconite or gelsemium every fifteen minutes for three or four doses. (b) If weak, rapid, and labored, give one sixtieth to one thirtieth of a grain of strychnin sulphate every four hours. Caffein is dependable in such cases. (c) If irregular and intermittent, administer four drops of tincture of digitalis every four hours. Spartein sulphate is a good substitute in irritable stomach. In extreme, urgent moments, with faint, aortic second sound and cyanosis, administer digalen hypodermically. Camphor is also a wonderful standby in such cases.

Among aged patients, the alcoholic do well un-

der brandy or whiskey at stated intervals, when more drastic stimulation seems to do harm. Children do nicely on ammonium carbonate, and ammonium chloride is added if there is much bronchial secretion. An ice bag applied to the precardium will quiet an irritable heart.

The temperature does not call for heroic treatment unless high. A temperature of 102° F. is left alone. A temperature between 102.5° and 104° F. is treated by frequent sponging with cool water or alcohol and water. If it mounts to 105° F. and above, the cold ice pack is ideal in sthenic individuals. Study the patient's reaction. A temperature below 102° F. in the first and second stages, with failing heart, chills, or cyanosis, requires the application of external heat to the body and stimulation. Raise the foot of bed. For safety keep temperature at 102° F. until resolution sets in.

The urine should be frequently examined. Measure the twenty-four hours' output and examine it for albumin. A slight trace is not alarming but calls for watchfulness and a larger intake of sterile water. Albumin with red cells and other cellular tissue means danger. Give diuretics. The best is tincture of digitalis. Counter irritants should be applied to the lumbar regions; dry cups are best.

Additional symptoms may include: (1) Pleuritic pains, which should be treated by the application of an ice bag locally, and if severe, by hypodermic administration of codein sulphate in doses of a quarter of a grain; strapping as a last resort. (2) Cough. If the cough is violent and in absence of cyanosis, give a mild opiate. If the cough is hacking and indicates excessive bronchial secretion, give stimulating expectorants, such as a mixture of two grains each of ammonium chloride and ammonium carbonate every three hours. Apply counterirritants to the chest. (3) Headache should be relieved by the application of an ice bag to the head. (4) Delirium requires the application of ice bag to the head. Leiter's coil may be constantly applied. (5) Dyspnea, if present despite cardiac stimulation, especially if there is much bronchial secretion, calls for oxygen in small quantities. It is best to use it early and at stated intervals, rather than use it in extremis when it is almost useless.

The diet should be liquid, consisting of milk, plain or predigested. Liquid peptonoids or panopeptone is added in weak individuals. Thirst calls for pure water. Lemonade is grateful to the patient and may be given.

As every case of lobar pneumonia has its specific germ producing antibodies, an autogenous vaccine is made from the sputum. It should be administered early, intravenously, in the severe types of disease. It is given at eight hour intervals, 50-100 mls to the dose. The temperature should drop soon after its use. When the temperature begins to rise again repeat the dose and watch the effect. Compare with the temperature chart taken every two or three hours.

Convalescence should commence after the crisis has passed and the temperature should steadily decline. A continuation of high temperature means delayed resolution or complicating symptoms, such as empyema, endocarditis, or abscesses of the lung, which should receive proper treatment.

Dr. Joseph Nack, of Bronx, New York, writes:

Lobar pneumonia being a self-limited disease, the aim should be to keep the patient's strength up by proper hygiene, good nursing, nourishing foods, and an ever watchful eye on possible complication.

A word of warning. Much harm can be done by an overzealous physician and nurse by attempting too frequent chest examinations and pushing nourishment beyond the patient's assimilative power. The same applies to stimulants. Each case must be studied individually and one must treat the patient and not the disease.

As to hygiene, if the patient is treated at home, a well ventilated, light, and cheery room should be chosen, a bed of the hospital cot type is preferable. If circumstances permit, the patient should have a trained nurse and in cases of double pneumonia, and in severe cases, a night nurse should also be procured.

As to prophylaxis, sputum should be received in sanitary cups containing some disinfectant, e. g., phenol 5 per cent. Mouth washes, as peroxide, thymol solution, or listerine, help to keep the mouth clean and lessen the tendency to spread disease.

Food, during the early stage of the disease, when the fever is high, should be limited to fluids, e. g., milk, plain or peptonized, egg albumin, milk broths, eggnog. Of these I prefer plain milk in eight ounce quantities, every two hours during the day and every four hours during the night. Should milk disagree or cause constipation, substitute egg albumin in the same quantities. For thirst, cool water, orangeade, Imperial drink, can be given ad lib. Two days after the crisis I allow two eggs for breakfast and two for supper; eggs can be given in any style; milk toast, chicken broth, cereals, white meat of chicken, or small chop, with some dessert and cup of cocoa is allowed. After the seventh day, when the temperature is normal, allow full diet. All food should be well prepared and appetizingly served.

General symptomatic treatment: For the fever,

if it is not above 103° F., sponge baths of alcohol and tepid water, equal parts, should be given every four hours. If above 104° F., sponge every three hours. If above 105°, every two and a half hours sponge and apply cold wet sheets to the body. Antipyretic drugs have no place because of their depressing action on the heart.

For the severe chest pain, mustard plasters, belladonna plasters, cuppings (dry), and with these one fourth of a grain of codein sulphate every four hours is beneficial. If the cough is dry and harassing, ten grains of ammonium chloride, five grains of potassium iodide, and twenty minims of syrup of senega every three hours give relief.

The heart requires attention, and the blood pressure should be taken frequently to determine if cardiac power is at its maximum or beginning to fail. If the blood pressure falls, and the secondary pulmonary sound becomes poor in quality and there is evidence of dilatation of the right chambers of the heart, stimulation with ten minims of tincture of digitalis every two hours, or five minims of digalen by mouth every two hours. Other cardiac stimulants, such as caffeine, sodium benzoate, spar-teine sulphate, camphor in oil, tincture of strophanthus, and strychnine sulphate are beneficial. In cases of cyanosis, with small, irregular, and rapid pulse and beginning edema, venesection may be resorted to and the intravenous injection of one grain ampoules of strophanthin and subcutaneous injections of strychnine sulphate in doses of one thirtieth of a grain, alternating with fifteen minims of adrenalin solution every two hours.

Pulmonary edema is relieved by venesection, cupping, and quick acting cardiac stimulants; eight to ten ounces of blood taken from the veins relieve the heart, and one one hundredth of a grain of atropine and one one hundredth of a grain of nitroglycerin cause dilatation of the superficial vessels of the body and relieve the heart, when given by hypodermic injections every two hours.

For pleurisy with effusion, frequent tapplings may have to be done. If empyema complicates, a surgeon should be called in.

In alcoholic cases delirium sometimes appears as a complication and requires careful watching on the part of the nurse to see that the patient does not do harm to himself. Delirium is combated by cold packs, and the administration of twenty grains of strontium bromide every three hours.

In septic pneumonia, blood cultures, and autogenous vaccines made, are beneficial in some cases. Otitis media, pericarditis, meningitis, and peritonitis require appropriate treatment. The pneumococcus serum is still in the experimental stage, but cases have been reported as cured by repeated injections of fifteen to twenty c. c. of the serum three or four times a day.

For convalescence, some blood tonic, and plenty of nourishing foods. I make it a rule to keep patients in bed at least five days after the crisis, when they are allowed out for a few hours at a time. The patient should not resume his occupation till he has fully regained his strength. A trip to the seashore or the mountains is recommended.

Dr. Stanley Barnett, of Monroe, N. Y., writes:

Pneumonia is an infectious and communicable, endemic and occasionally epidemic disease, caused by four distinct types of pneumococci—as shown by the experiences and experiments of Dr. Rufus Cole and his coworkers at the Rockefeller Institute. Types I and II are responsible for most cases of primary pneumonia. Type IV present in normal individuals is most often responsible for secondary pneumonia, as that which follows measles. Type III infections are relatively small. The individual susceptibility and resistance, and the amount of virus present, as true of all infectious diseases, play a great part in the contracting of pneumonia. Natural resistance will protect individuals against Type IV infection, and even against Types I and II; but prolonged contact and factors lowering bodily resistance will set up the disease, characterized by a prolonged chill, high temperature, pain in the side of the chest, and by a dry painful cough.

The treatment of pneumonia therefore, since it is a self limited disease, resolves itself into serotherapy and symptomatic treatment. The patient should have an individual room, and one well ventilated. Wherever possible, one should endeavor to determine the type of pneumococcus present. Time, however, cannot be lost, and two or three doses of serum against Type I, or a polyvalent serum, highly protective against Type I and also containing antibodies against Types II and III, can be administered with safety and beneficial results, as recommended by Prof. William H. Park, when type determination is impossible. Daily injections hypodermically of camphor in oil (the equivalent of 10-30 grains of pure camphor to 100 pounds of human body weight) can be given. These often gradually reduce the severe toxemia, and favorably modify other symptoms. For the relief of the pain in the side, which is often excruciating, a hypodermic injection of morphine, one quarter grain, should be given. Counter irritation, over the affected side by a mustard plaster or by dry cupping (practised in almost all cases of pneumonia in France) affords relief from the pain and dyspnea. A milk diet is most suitable, to which the thin cereal gruels and soft boiled eggs may be added. Plenty of water should be given. An initial purge with calomel, followed up daily with an enema, will suffice to keep the bowels in good condition. For the tympanites fifteen to twenty drops of dilute hydrochloric acid in some hot water, taken with each meal, and, if necessary a turpentine stupe to the abdomen or the insertion of a rectal tube, will give decided relief. As regards heart stimulants the patient should be carefully watched, and when indications arise, a gram of digipuratum, best given in divided doses in one day, will steady the pulse. This, however, should not be repeated, if the patient's condition improves. Inhalations of benzoïn, eucalyptus and creosote often relieve the persistent cough. The inhalation should be brief and no attempt made to curtail the supply of fresh air. If the cough is severe, codein, one quarter to one half grain, or heroin, one twelfth grain, should be given every four to six hours. The nervous manifestations, such as

delirium and insomnia, must be quickly overcome. An ice bag on the head, and morphine hypodermatically will prove of great benefit in giving the patient mental and physical rest. Daily, systematic and careful sponging off of the patient, and if necessary hydrotherapy, help in combating the high temperature. For failure of the circulation and edema of the lungs—caffein, digitalin, strychnin and atropin, given by hypodermic injection, must be resorted to.

The Treatment of Anthrax with Normal Beef Serum.—Clarence H. Hyman and Timothy Leary

(*Boston Medical and Surgical Journal*, March 7) review the literature of the serum treatment of anthrax and report a case in which it was successfully employed. The modern conception of external anthrax is of a low grade infection, which usually remains localized for long periods, and tends to get well under expectant treatment, except in certain situations, such as the eyelid. Under any other treatment than that by serum if invasion of the bloodstream occurs, the mortality is 100 per cent. Immune serum was formerly used, but was replaced by normal beef serum mainly through the activity of Kraus, of Buenos Aires, who reported fifty cases treated with it with no deaths. In all 146 cases have been reported with one death. The most rational explanation of the activity of normal beef serum in anthrax is that it obtains results by provoking a nonspecific proteid reaction. Foreign serum is, perhaps, the blandest agent which can be introduced into the body for the production of this reaction, and beef serum has the advantage over horse serum in that it does not give rise to serum sickness. Quoting from Kraus, they say that the results "exclude all doubt regarding the real and positive efficacy of this treatment in the cure of malignant pustule, and even of carbuncular septicemia. Hypodermic medication was sufficient in many cases, but in grave cases with intense symptoms, or accompanied by septicemia, the intravenous method is better and more sure, and requires no more care than is necessary in other intravenous medication. Doses of ten, twenty, or thirty c. c. constitute the ordinary quantities for each injection, augmented to forty and fifty c. c. in more intense cases. It is interesting to note that the therapeutic application of heated normal beef serum has produced no general or local disturbances comparable to those frequently produced by horse serum. This last produces in ten per cent. or more of the cases treated allergy, or serum sickness. Nothing comparable has appeared following the use of normal beef serum. In only two cases have we seen a slight hyperemic zone, with little intensity and fugitive, surrounding the point of injection, and found commonly following the injection of even the most innocent solutions. The injections, whatever the via employed, lead to an immediate elevation of the temperature with a descent in from twenty-four to forty-eight hours to the normal. At the same time there is produced a favorable local reaction, characterized by diminution of the edema and a bettering of the general condition. In some cases the edema progresses and the fever continues until a new injection is made."

Medicine and Surgery in the Army and Navy

PRINCIPLES OF TREATMENT OF GUNSHOT WOUNDS AT CASUALTY CLEARING STATIONS.

By H. M. W. GRAY, C. B.,

Aberdeen, Scotland,

Temporary Colonel, A. M. S.; Consultant Surgeon, British
Expeditionary Force.

The necessity for going fully into the operative treatment of war wounds will be realized when one considers that military surgery was unknown in practice to most medical men before this war and further that many men who have had little or no experience as surgeons are called upon, during periods of severe fighting, to lend a hand in the treatment of wounds.

One of the greatest obstacles to successful wound treatment in France is the virulent inflammation which is prone to intervene. Fighting on a highly manured soil laden with pathogenic organisms of most noxious type, has provided many problems for solution. The behavior of the inevitably infected wounds has wafted us with unsavory breezes back to preantiseptic days. High explosive missiles have produced types of wounds which were new to the profession in many respects.

It seems as if war inclines many to carelessness in aseptic or antiseptic ritual during the performance of operations. No greater mistake can be made. Surgeons who get the best results are those who are most thorough and careful both with regard to removal of lacerated infected tissue and to rigid observance of aseptic technic. Difficulties arise constantly owing to the fact that those who have not seen cannot appreciate the appalling virulence and rate of development of infections which may occur. Avoidable loss of life and limb will be prevented if newcomers on this field, of whatever standing in civil life, will take warning from the dreadful experience to which surgeons on this side of the Atlantic have had to submit, and will mould their treatment of wounds on the lines now laid down.

It is well to bear constantly in mind the state of affairs existing in a gunshot wound and the objects to be attained by operation. A missile passing through a limb dissipates a considerable amount of its energy in the tissues; they are struck a terrific blow, and the greater the resistance they offer the more energy will the projectile lose in its flight. When the resistance is enough to arrest, for example, a bullet, it is obvious that all the energy of the missile is spent in the body. It does not follow, however, that the tissue injury caused by a lodging wound is greater than that from a traversing wound. The special gravity of lodging wounds depends on other factors. Given an equal resistance to its passage, the higher the velocity of the projectile, the greater the damage inflicted on the tissues. This damage is not limited to the track of the missile; it imparts its momentum to everything in its line of flight, so that a radiating area of vibration is set up destructive to cellular life. If the tissues vary in

density, the more compact will be driven through the more yielding, with a shattering effect.

This is the first point of importance: the immediate destructive effect of a projectile is not limited to its path. The second point is that practically every wound is permeated with foreign material bearing aerobic and anaerobic organisms, and some of the latter thrive luxuriously in the lacerated and devitalized tissues among which they are sown. The third point is that the organisms of gas gangrene grow rapidly in parts, and especially in muscular tissues, which are deprived of normal blood supply. The fourth point is that the amount of infection carried by various kinds of missiles varies enormously. This will be dealt with later.

Operation is performed to attain ample access to every infected part of the wound, so that all foreign matter and dead or dying tissue may be freely and thoroughly removed, and that thereafter adequate drainage may be insured when necessary. In most regions direct inspection of the greater part of the wound can be procured. Treatment guided by palpation alone is permissible or advisable only when incision would necessitate division of such structures as the main vessels or nerves of a limb or destruction of the function of vital organs.

Excision of wounds.—In certain wounds which can be excised *in toto*, primary suture without drainage is practised with success, provided that the necessary technic is observed. The great majority of wounds cannot be treated in this way. The nearer complete excision can be approached, the better will be the result. The presence of anaerobic gas forming organisms is so frequent in war wounds in France that all large lacerated wounds must be regarded in the preinflammatory stage as being infected by them. It is known that such bacilli grow most readily in muscular tissue which is deprived of circulating oxygenated blood. It is necessary therefore in the primary treatment of wounds to excise all lacerated muscle until definitely bleeding tissue is reached. In the case of a lacerated muscle or group of muscles whose blood supply has also been cut off by the missile, this principle may entail removal of the whole affected muscle or group. Failure to observe this indication often results in amputation or at best repeated excision. Such "repeat" operations, unless in cases of forlorn hope, usually indicate either timidity on the part of the operator or want of appreciation of pathological conditions and processes. Absence of bleeding in freshly incised muscle is of far greater importance as an indication for excision than is the presence of the so called "brick red" discoloration which is found so frequently in parts affected by gas gangrene. The writer has often left such discolored muscle, adjacent to excised, definitely gas infected muscle without ill effect, but has always made certain that the discolored muscle bleeds on superficial incision. The pathology of gas gangrene, described so ably by Colonel Cuthbert Wallace and others, should be closely studied. In the writer's opinion, the situation may be summed up

by saying that gas gangrene will not develop in tissues which are furnished with circulating well oxygenated blood. Primary operation should not fail in procuring a condition of affairs which will be inimical to gas gangrene. It is obvious that in many cases amputation is the only procedure which will accomplish this.

Wounds in men who have been lying out on the battlefield for several days are approached from a different standpoint. Here the patient has either utterly failed to combat gas infection and is, on arrival at the casualty clearing station, in such a condition that amputation is the only resort, or else has successfully overcome the tendency for inflammation to spread and may then be merely suffering from retention in pockets of the wound. In such cases only a limited operation is justifiable; all that is required is free drainage of the pockets of retention and possibly removal of foreign bodies. Attempts at radical treatment are unnecessary and have usually been followed by disaster.

Although, during "peace" times, primary suture of large wounds or amputation stumps treated on most recent lines is attended with gratifying success, yet in periods of severe fighting it is not advisable to make primary suture unless one is very sure of having procured asepsis. The patients cannot be retained for observation at such times and the wounds are apt to "go wrong" during transport to hospitals further in the rear. These remarks apply especially to wounds of the limbs and trunk in regions which cannot be absolutely fixed by splinting.

Primary suture should be done, however, when the necessary conditions are fulfilled, in, for example, wounds of the knee joint, because that joint can be absolutely fixed and supported during transport; in wounds of the brain or its coverings, and in chest and in abdominal wounds. The latter cases usually must be kept at the casualty clearing station for several days or weeks. In all such cases from which gross sepsis has been removed, it is found that restoration of function, where that is possible, occurs far more quickly and certainly after wounds have been carefully sutured. The use of paraffin pastes, solutions, or emulsions of different kinds has been found of much apparent value in insuring aseptic healing.

The use of antiseptics and dressings.—It cannot be too urgently emphasized that the use of antiseptics will not make up for inadequate operative treatment. One might safely say also that the stronger the antiseptic, the worse the result. One need not discuss the reasons why. On the other hand, provided that operation is adequate, one kind of rational aftertreatment does not seem to influence the patient's chance of life or limb very much more than another. The results claimed by the supporters of varying methods do not seem to differ very greatly. It is doubtful indeed whether, after proper operative treatment of the wound, a wound treated by antiseptic methods does any better than one treated by aseptic methods. One wound differs from another in behavior even in the same patient. The kind of dressing which will best assist Nature's endeavors in the processes of healing is that which

is most suitable. If a dog receives a wound in a leg, he does not use that leg. Only if the wound becomes inflamed and irritating does he change the dressing by removing the scab and noxious fluid under it by licking. We should procure rest for an injured part by splinting and support, and we should apply a dressing that does not require interference unless definite indications arise. It should not require routine attention. Disturbance of the walls of a wound is bad, especially if it is so gross as to cause bleeding, i. e., tearing open of blood channels which is performed accompanied by tearing open of lymph channels as well. Such disturbance, e. g., rough removal of adherent dressings or forcible movement of a wounded part, is usually followed in large wounds by such gross manifestations as rise of temperature, quickened pulse, deterioration in the local and general condition of the patient, and so on. The dressing applied in or on a wound should be soothing, and because our efforts in procuring asepsis are liable to be inadequate in many wounds, it should contain either a nonpoisonous antiseptic or a harmless amount of a poisonous one. The dressing should be capable of easy and painless removal. The writer believes that all these requirements are met best by the judicious use of solutions, emulsions, or pastes of various antiseptics in paraffinum liquidum. The antiseptics which have been used up to the present in this way are flavine, 1 : 1,000; brilliant green, 1 : 500; iodoform, one per cent., boric acid and chloramine, T. The boric acid is usually mixed with other antiseptics in sufficient quantity to form a paste of the consistence of soft butter. Wounds after operation are smeared with one or other of these applications and either sutured or packed lightly with gauze impregnated with plain paraffin, or better, iodoform paraffin, one per cent. Secondary suture is performed, if possible at all, when the wound is free from inflammation and excess of microbes. In many cases this can be done in two to four days. Bipp, recommended by Prof. Rutherford Morison, must be used sparingly in recent wounds, else severe symptoms of poisoning may ensue—bismuth subnitrate, one part; iodoform, two parts; paraffinum liquidum. Failure to get good results by such a dressing is possible evidence either of incompetence in cleansing the wound or impossibility of doing so. Pure paraffin applications have an obscure but definitely beneficial effect on the walls of a wound. Theoretical explanations need not be discussed.

During a period of severe fighting, when hundreds of serious cases pass through each casualty clearing station in a few days, it is essential to use a postoperative dressing which requires the minimum of attention. Dressings should therefore be applied in such a way that the wound can be easily inspected. A wound, efficiently treated in the way indicated above, can be left with safety for many days. Any form of dressing which requires frequent attention, whether by syringing or changing of applications, is unsuitable for base hospitals near the front. The use of strong antiseptics which cause necrosis of the tissues or coagulation of the body fluids has been proved definitely harmful.

Operative treatment.—It is unnecessary to do

any operation in the majority of wounds caused by undistorted rifle or machine gun bullets, in which there are only tiny entrance and exit wounds, and in many caused by very small lodging pieces of shell. In these the amount of infective material carried in may be so small that it can be dealt with by the tissues without further assistance. In all such cases, however, the part should be supported by a bandage or even splinted for a few days, especially if the missile has passed transversely across the fibres of a muscle. Careful watch should be kept for the onset of inflammation. If, however, the wounded part is swollen and tense owing to hemorrhage from a large wounded vessel in the depth, and especially if any inflammation is present, the part should be opened up freely and dealt with according to indications.

In larger wounds, in addition to what has already been said, excision of the edges of the skin and deep fascia should be made and further planned incisions should radiate from the new superficial wound, in order to expose freely the wounded tissues in the depth. Usually not more than one quarter inch of the skin margin need be removed. Besides lacerated muscle, exposed torn aponeurotic structures should be cut away as they are practically certain to slough. At the end of the operation such structures should be covered by skin or muscle whenever possible.

At the beginning of the war there existed a great antipathy in many quarters to making fresh incisions in the presence of acute and even of chronic sepsis, because it was thought that such incisions, by laying bare fresh tissue, entailed a greater risk from the spread of infection than the simple insertion of a large drainage tube through a smaller opening. When suitable treatment is used it is found that there is no such increase of danger; quite the reverse. The success of the open method of treating amputation stumps amply demonstrates the truth of this.

Necessity for planned incisions.—Transverse or oblique incisions admirably fulfil the purpose of free exposure and are sometimes compulsory, but one must remember that only rarely can a muscle which has been cut completely across be united again satisfactorily. Transverse incisions, therefore, are apt to be mutilating and harmful to function afterwards. A smaller cone shaped excision, in which only part of the muscle is sacrificed, sometimes gives even more efficient drainage. It must be remembered that occasionally the whole belly of a muscle is virulently infected. When that happens the muscle will necrose and it is far quicker and safer to excise the whole muscle at once, for example, the rectus femoris or gluteus maximus. Superficial incisions therefore should usually run more or less parallel to the muscles involved. In any case it is best to insert a finger in the wound and examine its extent and arrangement before deciding what form of incision or excision is to be employed. Counteropenings at the most dependant parts of the cavity are of great importance in certain cases, for example, when one cannot make certain that all infective material has been removed from the back of such a bone as the femur. It

must be remembered, however, that such dependent openings are somewhat inimical to the rapid success of Carrel's treatment, because, of course, injected fluid drains rapidly away.

It happens fairly frequently that so many multiple wounds from lodged fragments of shell occur close together that excision of each separately is not advisable. Such cases are often in bad condition so that haste is necessary. A single long incision down to the deep fascia, followed by rapid undermining of the subcutaneous fat to beyond the wounds, will usually reveal the extent of the damage to the muscle and facilitate quick decision as to what had better be done. In many such cases gas gangrene develops quickly, and free excision of the affected part of the muscle is best. The lodged fragments often cause considerable churning of the tissues where they finally come to rest. Needless to say their resting place must be scrupulously cleaned out if not excised.

Cleansing of the wound.—Extraordinary divergence of opinion still exists as to what constitutes thorough cleansing of the wound. Mere blind twisting of a swab inside a wound cavity may do as much harm as good. Simple flushing through with a solution is very ineffectual, but, if hydrogen peroxide is used, infective particles may be carried into the recesses of the wound which were previously clean. A lacerated deep wound should be thoroughly opened up and every pocket of it examined and enlarged if necessary. Meticulous care should be exercised in removing foreign bodies and blood clot by forceps, fingers or swab, and clipping away all necrotic or badly lacerated muscle or fibrous tissue. Irrigation is rarely necessary or desirable. Each pocket must then be carefully packed or have Carrel's tubes placed in them. If any recess be left untreated, there is great risk that the wound will not do well.

Fixation of the wounded part must be secured, in mild cases by proper bandaging, in severe cases by splints, even although the soft parts only are affected. Efficient fixation will limit effusion and consequent swelling as well as the amount of pain which the patient will suffer.

Support.—The soft parts must be prevented from sagging, especially where deep lacerated wounds accompany fractures of such a bone as the femur. Support is best provided in such a case by suitably shaped gutters of perforated zinc, properly padded and covered with waterproof material, which are placed under the limb. The edges of the gutter are bent over the bars of the Thomas's splint which is now universally used for such cases. The slings should be arranged so as not to interfere with easy access to the wound or with drainage. They may require renewal about once a week. Suitably sized pieces of Gooch's splinting make excellent reinforcing supports to such slings.

Drainage and kind of drain.—The primary object of drainage is, of course, to prevent accumulation in dead spaces of fluids which will form a favorable medium for the growth of pathogenic microorganisms, and which, on physical grounds alone, will prevent or delay healing by keeping the tissues

from adhering. All the same, if the dead space is not large and can be obliterated by suitable bandaging or suture, if the effusion is likely to be small in amount, and if the wounded part has been rendered aseptic, as, for example, after excision, then there is really no necessity for drainage. In certain cases, for example, when slight infection of the knee joint or of the brain exists, the presence of a foreign body such as a rubber drain, and still more a glass or metal one, in the affected part will probably allow sepsis to gain a firm hold, especially in the parts bruised by the drain, the very thing the drain is meant to prevent. It seems absurd to take a deal of trouble to remove one unyielding foreign body and forthwith to insert another, unless for very definite reasons.

Drainage of large wounds is effected best by inserting a fairly firm pack of paraffin impregnated gauze. Discharge finds its way readily at first between the walls of the wound and the pack and later into the pack itself. The pack should be made to fill the wound accurately. Flat pieces of gauze are laid on top and these can be changed when desired without disturbing the pack. The latter can usually be left *in situ* until granulation has begun. It will then be easily and painlessly removed. As already stated, in many cases the pack is removed and the wound closed in two to four days or so after the primary operation (4).

Many surgeons prefer to drain and purify such wounds by Carrel's method, especially when extensive comminution of bone has occurred. This method is a most excellent one, but entails very skilled and careful attention, which cannot always be obtained. The so-called "salt pack" also gives excellent results.

"*Down to but not into.*"—The more delicate or highly organized a tissue is, the more damage is likely to be caused by the introduction of a drain, especially a rigid one. Experience has shown that the principle of introducing such drains "down to but not into" the important structure or cavity which has to be drained is sound. It matters not whether brain, shattered bone, or pleural or synovial cavity has to be drained, this principle holds good. This refers to the preventive function of a drain which is used when infection has not yet obtained a firm hold. When infection is really well established and is already causing suppurative encephalitis, osteomyelitis, or synovitis, the matter is more difficult and requires much judgment. The presence of decomposing blood clot, loose purulent lymph clot, or even offensive pus in a joint, although the synovial membrane be swollen and injected, does not mean that the joint is inevitably doomed to destruction. Many brilliant results have been obtained, even in the knee joint, which was thought to be particularly vulnerable, when the cavity has been cleansed thoroughly of foreign bodies and purulent contents, washed out with appropriate solution, and then drained by a tube which led down to but not actually into the hole in the synovial cavity. In some cases, and this depends on the character of the wound left after operation, leaving the wound open, no drain tube being inserted, and protecting it from secondary infection by an antiseptic pack seems to be an equally efficient method. Absolute

fixation of the joint in the early stages is indispensable to success.

Drainage of the brain, when abscess has formed round imbedded bone or foreign body, is a very difficult matter. Rigid drains are particularly harmful to the brain. This is especially true if holes be cut, for the intracranial pressure forces even normal brain through the holes or the end of the tube; moreover, the constant friction of the pulsating brain against the hard foreign body must have a bad effect. The most satisfactory drain seems, on the whole, to be a piece of rubber tissue or similar substance, folded concertinawise. If, however, the pus be particularly thick or profuse, it may be necessary to insert, in addition, a tube for a short distance and for a short time.

A drainage tube thrust amongst the fragments of a shattered bone will tend to carry infection, and in any case to cause necrosis of the fragments in contact with it. A drain on each side, down to but not into the shattered mass, will do all that is required. Rigid drains in contact with pulsating vessels predispose to secondary hemorrhage. In a septic wound they are practically as efficient in causing this as are displaced fragments of bone or pieces of missile. When drainage of wounds which expose large vessels is required, the advantage of transverse incision of muscle or coneshaped excision is obvious.

It is not, as a rule, good practice to draw a non-collapsible drain through the whole length of a wound. It is in most cases quicker and safer either to excise and suture the wound entirely or to lay it open and make secondary suture as soon as it is healthy. It is especially dangerous to draw tubes through between the bones of the forearm or leg. The tube is likely to cause, from its pressure, sloughing of the interosseous membrane, secondary hemorrhage from the vessels which lie close to the membrane, and paralysis from destruction of the nerves which accompany these vessels. In some cases, e. g., in a tunneling shrapnel wound in which there is not much destruction of the walls, a "draw through" gauze wick, impregnated with antiseptic paraffin, is sufficient to prevent development of acute infection.

Removal of drains.—When one is certain that the wounds are healthy, and if there be no necrotic tissue in the depth, it is desirable to remove drains altogether, provided the surfaces of the wound are pressed together by external dressings, but it is probably safer practice to shorten them gradually. Rigid drains should give place to soft drains—jaconet, batiste, torn glove, or absorbent bandage—as soon as the discharge ceases comparatively to be profuse.

Tension.—Tension in a wounded part militates against successful treatment. It interferes with the efficient circulation essential for the combating of infection; parts which are best supplied with blood, for example, the scalp or face, heal most quickly. Therefore another great principle is established: that tension must be relieved, whether in a joint, in the thigh, in the chest, or in the brain. Aspiration of a joint or pleural cavity may suffice. The extensive incisions which are advocated in many cases probably do as much good by relieving tension as by providing free drainage.

(To be concluded.)

MEDICAL NOTES FROM THE FRONT.

GENEVA, January 30, 1918.

In my last communication I studied the most common form of chlorine gas poisoning which, in spite of its gravity, may still be successfully overcome by modern therapeutics. But occasionally rapidly fatal cases are encountered. Death takes place in one of two ways; either in an overwhelming way, in a few hours time or rapidly within the space of from three to five days at most. In the first variety there is no pulmonary disturbance, or at all events, pathologic changes are only just beginning. In the rapid form the patients are cyanosed and violently dyspneic or they are, on the contrary, very pale, as in cases from drowning or in asphyxia of the newly born we have the cyanosed and pale facies. In the latter class, auscultation simply reveals a nearly complete respiratory obscurity and no râles. There is no expectoration, the pulse, soft and depressible, is intermittent and does not appear to react to any form of stimulant.

These patients are quite indifferent to everything going on about them and die in a semicomatous state. Occasionally, they have periods of lucidity but die in a few minutes, probably from cardiac syncope. In the latter class of cases no lesions of pulmonary edema can be discovered so that pathology must be looked to for an explanation.

In the cyanosed cases the patient at first offers the same clinical picture as in the now fatal serious cases. Nothing at first indicates that death is at hand but soon a sign appears which denotes the gravity of the case. When speaking of the treatment I shall show that the gas poison cases bleed poorly, but in the fatal ones no blood will issue after a vein has been exposed and freely opened. Sometimes prolonged oxygen inhalations may result in an instant of calm, but only temporary, and soon another paroxysm of dyspnea comes on. In the fatal cases each succeeding paroxysm seems severer than the preceding, until the fatal one takes place during which the patient ejects a large quantity of bloody frothy secretion. These patients do not live more than three or four days and those who die from gas poison after a lapse of five days do so as the result of some complication.

At autopsy, subjects dying with symptoms of pulmonary edema show a marked congestion of the upper respiratory tract. There is congestion of the glottis, but in all necropsies there is always a slight degree of edema. The trachea is very hyperemic with minute hemorrhages scattered over its surface in certain areas. These hemorrhagic spots, which are never larger than a millet seed, seem to be scattered over the tracheal surface in islands.

Both lungs will be found in a condition of gross edematous inflammation but pieces of pulmonary parenchyma sink directly in water. On section they are literally soaked in a serosanguinolent frothy fluid, while the bronchi are obstructed by stringy mucus. The heart is enormously dilated, particularly the right ventricle, and on section the ventricular cavities are found obstructed by large clots. The liver offers the aspect of the cardiac liver. It is nutmeg color and on section gives the impression of fatty changes having taken place. This rapid de-

velopment of the hepatic lesions in chlorine poisoning is not to be wondered at if it be compared to what takes place in phosphorus poisoning, for example. In the latter, toxemia, steatosis also, occurs within six to eight hours.

These changes in the liver show how hepatic insufficiency even reaching icterus gravis, might be explained in cases of chlorine gas poisoning, but these symptoms apparently do not arise in patients who recover. The stomach presents small interstitial hemorrhages and these lesions of the mucosa explain the vomiting, as well as the gastric pain and burning sensation in the epigastrium. There is some renal hyperemia but all other viscera are normal.

In patients dying very quickly after inhaling the gas, a massive pulmonary congestion is found, but no edema or hepatic steatosis. The gastric mucosa is injected, likewise the brain. There is no ventricular hemorrhage, therefore death must be due to anoxemia before pulmonary edema has had time to develop. The treatment of chlorine gas poisoning has three principal ends to attain: to control the pulmonary edema, sustain cardiac action, and supply the insufficiency hematosis. The treatment of the pulmonary edema consists of a general and local bloodletting, both being employed at the same time because general bloodletting is rarely free, seeing the rapidity of blood coagulation in these cases is very marked. The blood clots in five or six minutes, while the normal time is about thirteen minutes. The viscosity of the blood is also very high, therefore it flows off slowly. Consequently, bleeding appears to be formally indicated and should be systematically resorted to.

The bleeding, however, which lightens the work of the heart and lungs is not in itself enough to completely free the respiratory tract, so that ipecac, given in emetic doses of fifteen to twenty grains at first, and afterwards at the dose of seven grains for five or six days is given. Ipecac is an expectorant, purgative, cholagogue and hypotensive in action and it likewise possesses a mechanical action in as much as by the vomiting and nausea to which it gives rise it causes contraction of the diaphragm and intercostals which tends to compress the lung, thus forcing out the pulmonary secretions which obstruct it. Emetine hydrochlorate hypodermically at the dose of two thirds grain has been employed for the same end.

What strikes one in chlorine gas poisoning is the rapid cardiac failure. The patients are somnolent and in some cases the great danger resides in bulbar paresis. Therefore the cardiac action must be sustained and the nervous system stimulated. This is accomplished by injections of camphorated oil (twenty per cent. solution) at the dose of ten c. c. and injections of strychnine sulph.

The use of camphor in pulmonary edema has the double advantage of acting on the myocardial atony and as an excitant of the nervous system. Strychnine, spartein sulph., caffein, and especially ether, are employed subcutaneously. Ether is an anti-dyspneic by its action on the respiratory centre and at the same time a cardiac stimulant. For the insufficient hematosis, inhalations of oxygen are useful and, combined with bleeding, is certainly the

treatment that has given the best results. The air of the ward should be maintained damp by vapors of menthol or eucalyptol which eases the cough and may to a certain extent prevent the development of complications. Many academic discussions on the treatment of chlorine gas poisoning have taken place, but from all accounts I believe the treatment above outlined will give the best results.

Regarding the proper measures for the prevention of gas poisoning: Each man has his mask and spectacles for protection against the gas, and certain measures of a technical nature have been devised for destroying the gas waves. Therefore, the soldier has only to observe personal discipline, namely, to adjust his mask with care, never to run, and evacuate the shelters immediately.

As soon as a gas wave is signaled or the odor of chlorine indicates its approach, the mask is to be put on without hurry. It should be applied hermetically over the face, but regardless of every precaution, if the gas waves succeed one another some chlorine may enter the respiratory tract. This is made evident by paroxysms of coughing.

The entrance of the gas through the mask may be explained as follows. The mask in reality serves as a filter over the nose and mouth, but after a time the neutralization of the gas is no longer complete on account of saturation of the liquid protective. In these circumstances, all that is necessary is to slightly displace the mask over the face to change the filter surface and thus the accidents will be avoided. If the cough persists it can be at once controlled by a few inhalations of ammonia, which forms chloride of ammonium.

The soldier must never run away from the gas wave because it rolls forward more quickly than a man can run and it will overtake the soldier almost certainly and from his running will catch his respiratory tract in disorder. The respiration will have been so greatly interfered with by the mask that the natural instinct of the man will lead him to raise it from his face in order to breathe more freely and the chlorine gas will be thus inhaled in massive doses. All shelters must be evacuated at once because the gas invades them. Therefore, with his mask well adjusted, the soldier should remain at his post which is the best means for avoiding chlorine poisoning. By so doing, the effects of the gas are practically *nil* and the Huns will once more be outwitted in their infernal endeavors to overcome civilization by these horrors. CHARLES GREENE CUMSTON.

The several naval hospital corps schools are now graduating more hospital apprentices than are being assigned to the corps from the recruiting service, due to the fact that the authorized strength of the enlisted personnel of the corps has been reached. As soon as Congress authorizes an increase in the enlisted strength of the navy, which will carry with it a corresponding increase in the hospital corps, special efforts will be made to resume enlistments for the corps. It is expected that the present enlisted force will be augmented by about 3,000 men, all of whom will be required to meet the demand.

MEDICAL NEWS FROM WASHINGTON

The Allowance of Doctors and Dentists for the Army.—New Classes at the Naval Medical School in Washington.—Transporting Home Wounded American Soldiers.—Health in Army Camps.—Increase of Naval Hospital Corps and Enlistments.—An Army Nurse Corps.

Questions relating to the total enlisted strength of the regular army authorized by law have been before the War Department officials for some time, in connection with determining the number of officers of the Medical Corps and of the Dental Corps allowed the regular army, these numbers being fixed by existing law on the basis of percentage of the regular personnel. Several decisions on the subject have been made by the Judge Advocate General of the Army and the Secretary of War, and a new, and presumably final one has just been rendered. It is understood that the ruling is that the authorized enlisted strength is 286,000.

Under a previous decision, 300,000 men in the army was taken as a basis for ascertaining the allowance of members of the Medical Corps, the national defense act of June 3, 1916, prescribing that "the total number of such officers shall approximately be equal to, but not exceed, . . . seven for every one thousand of the total enlisted strength of the regular army authorized from time to time by law." On this basis a number of promotions were made to the grades of colonel and lieutenant colonel. On the basis of the less number of 286,000, there is an excess number of officers now in those grades, and they will have to be absorbed. However, as a number of retirements are in prospect during the next few months, the situation will not be difficult to adjust.

There are now 833 officers in the Medical Corps, including those recently recommended for appointment, and on the basis of the prescribed total of the enlisted strength there will be over 1,000 vacancies to be filled in the lower grades.

The Dental Corps of the regular establishment, now consisting of 209 officers, is entitled to about ninety more, in view of the fact that its allowance is based on the total commissioned and enlisted strength of the army, estimated at 300,000, instead of the total enlisted strength only, one being allowed per thousand.

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Upon recommendation of the Surgeon General of the Army, the Acting Secretary of War has directed that the allowance of dental personnel for the divisions about to depart for France be increased. Such divisions will have thirty-one dental officers and thirty-two enlisted men as dentists' assistants, in place of the former allowance of twenty-five in each class.

The allowance of dental officers as prescribed by law for the regular army—one per thousand of the regular commissioned and enlisted personnel—has been followed in placing members of the Dental Reserve Corps and of the Dental Corps of the national army on active service. The increase in the allowance for the overseas divisions will not have the immediate effect of increasing the number of members of the Dental Reserve Corps and Dental Corps of the national army on active duty, but that ultimately will follow.

The dentists believe that the allowance is too small, and basing their estimates on the average number of patients taken care of by a dentist in civil practice they are advocating an allowance of three dental officers per thousand of the military personnel. The allowance of thirty-one dental officers to an overseas division gives less than two per thousand.

A new class of eighty-five recently appointed members of the regular Dental Corps and of the Dental Reserve Corps will commence a two months' course of instruction at the medical officers' training camp at Fort Oglethorpe, Ga., on April 15.

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It is contemplated by the Surgeon General of the Navy to appoint about 1,000 medical reserve officers during the next twelve months, and information as to this opportunity to enter the medical department of the navy is being communicated generally to the medical profession. The officers will enter the service as assistant surgeons with the rank of lieutenant of the junior grade. The expansion of the navy and its increasing personnel make it necessary to provide for these additional medical officers. A class of thirty officers of the Naval Medical Reserve Corps commenced a course of instruction on April 3d at the Naval Medical School at Washington, and it is the first one at the school composed exclusively of reserve officers. The course will specialize in laboratory work, sanitation, the use of chemicals, and war surgery. It will have the benefit of lectures by instructors well posted in the recent advances in medical and surgical work of the naval and military services as developed by the war. Lectures on surgery will be given by Medical Director Howard F. Strine, of the navy, who is not only a surgeon of unusual experience and ability, but also particularly well qualified to teach about developments in war surgery and to impart to newcomers the valuable information that has been received of the latest advances.

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The question of hospital ships in connection with the return of wounded soldiers from abroad has been settled. The Navy Department has taken charge of the transportation of the army sick and wounded, who will be provided for on returning transports. The surgeon general of the army believes that this is a very satisfactory settlement of the matter. The transports will not be fitted out as hospital ships, but the sick bays will be increased to some extent. There is a suggestion of the possible objection to using transports in this way, in that they do not have the protection of the Geneva Cross. It is realized that there will be a great deal of criticism if one of these transports loaded with sick and wounded is sunk. However, for comfort and real safety it is believed that the transports should be used. Moreover, owing to the scarcity of overseas tonnage, it is practically impossible to assign any of the larger types of vessels solely to hospital service. Besides, as the Germans do not respect hospital ships and their identifying flags and other marks, but have ruthlessly sunk them without notice, it is believed that sick and wounded can be brought

home on transports with as much safety, if not more, in view of the fact that they are armed.

* * * * *

Late medical reports show that the health of the troops in the United States continues generally good. Admissions, noneffective and death rates are some what higher, due chiefly to prevalence of influenza and bronchitis, with complicating pneumonias. Many of the northern camps, national guard camps, as a group, continue with remarkably low rates.

Statistics as to health conditions in the French and British armies at present are not available here, but the general figures obtained regarding the Japanese show that the health of our soldiers is very much better. There are many of our camps, with 40,000 men, where the death rate is less than one per thousand.

* * * * *

The Senate Committee on Military Affairs has reported favorably a bill prescribing the personnel of the army Nurse Corps, the qualifications for appointment, the method of appointment, the pay, allowances, and leaves of absence of the members, and the conditions under which they may be retired. It is provided that the female nurse corps of the Medical Department of the army shall be known hereafter as the army Nurse Corps, and shall consist of one superintendent who shall be a graduate of a hospital training school having a course of instruction of not less than two years, and of as many chief nurses, nurses, and reserve nurses as may from time to time be needed and prescribed or ordered by the Secretary of War, and, in the discretion of the Secretary of War, of not exceeding six assistant superintendents, and, for each army or separate military force beyond the continental limits of the United States, one director, and not exceeding two assistant directors of nursing service, all of whom shall be graduates of hospital training schools and shall have passed such professional, mental, moral, and physical examination as shall be prescribed by the Secretary of War.

The annual rate of pay for members of the corps is fixed as follows: Superintendent, \$2,400; assistant superintendents and directors, \$2,000; assistant directors, \$1,800; chief nurses, \$360 in addition to the pay of a nurse; nurses, \$780 for the first period of three years' service, \$840 for second period of three years, \$900 for third period, \$960 for fourth period, and \$1,020 after twelve years' service in the corps, including in all cases time of service as contract nurse; reserve nurses, when on active duty will receive the same pay as nurses that have served in the corps for periods corresponding to the full period of their active service; and all members of the corps, in addition to the foregoing, the sum of ten dollars a month when serving beyond the continental limits of the United States, except Porto Rico and Hawaii. Members of the corps, after twenty years' service, including for the purpose of computation time of service as a contract nurse, upon their own applications, may be placed on the retired list and receive seventy-five per cent. of the pay, exclusive of foreign service pay, they were drawing at the time they became entitled to retirement.

Editorial Notes and Comments

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MORE MEDICAL OFFICERS NEEDED.

The German army has taken into its own hands the question of speeding up the war. Launching a mass attack on a hundred and twenty-five mile front the allies have been driven back from five to thirty-five miles. Each day we read of small gains by the enemy, and, with occasional intermissions the pressure has been steady, and gains almost continuous. The reserves of the allies have been poured in to stop this relentless pressure, but with only partial success. The American troops are on the move to the fighting front, yet a cry has come for more men and still more men; for immediate transport of men to France whether trained or not. Within the year a million and a half American soldiers will be in France, taking with them fifteen thousand medical officers. There are only 15,174 officers of the medical reserve corps now on active duty. The remainder required for the second draft and for other drafts to follow must be furnished from medical men now in civil life.

The record made by the medical profession of America in this war has been a glorious one. Its members have come forward most generously, yet

to maintain the traditions established many more must go to the front. Every physician between the ages of twenty-two and fifty-five who is physically, morally, and professionally acceptable will be welcomed to the corps. Applications can be made either direct to the Surgeon General's Office at Washington or to any of the recruiting boards provided for the medical reserve corps at all the cantonments and large hospitals or the larger centres of population in the United States.

There has been no need to draft medical officers, but if this terrific drain goes on such a need may soon appear, for the available list of the reserve corps is insufficient to meet the demand of the second draft. Every doctor of medicine who is physically fit should send in his application for a commission that the supply of medical officers may not fall short.

CAN NOT OR WILL NOT.

There are many forms of disease launched into the world, christened, and already recognized before any one asks the date of their first recognition or the observer, so it comes that the "emotional psychoneurosis," as distinct from hysteria and neurasthenia or traumatic neurosis first noticed by Dr. Ernest Dupré in 1911 in his *Constitution émotionné*, and little heeded, has now found a place upon the battlefield and in the law courts and has been named by Dr. Maurice de Fleury, his associate, *la maladie de Dupré*. He thinks a recognition of the state would lead to a more rational classification of the psychoneuroses, and a fairer judgment of the so called "cowards," "slackers," and those accused of defrauding the accident insurance companies, because, as he shows in the *Bulletin de l'Académie de Médecine*, February, 1918, in the true emotional conditions, there is a tremendous effort made at self control; an eagerness shown to get back to duty, a shirking exposure of symptoms, all so different from the hysteric who welcomes publicity and whose symptoms ameliorate in proportion to the assurance of insurance compensation or exemption from duty. M. de Fleury gives two interesting cases—husband and wife, the suffering from a congenital form of emotionalism aggravated by responsibilities as an army officer, she from the same condition brought on through being in a serious railway accident. From the ordinary military or medicolegal point of view, the one would be pronounced almost a coward, the other an hysterical neurasthenic, but Dupré

classes as purely emotional the circulatory, digestive, respiratory disturbance, the trembling, the troubles of cardiac rhythm, hyperflexion, saying that they point to an enormous total of neuromuscular automatic activity, and have no connection at all with the clinical picture of nervous exhaustion. He admits the difficulty in diagnosis. Here was the officer, seized, in the presence of his men, with trembling all over, even to chattering teeth, profound sweating, violent tachycardia, and emotional disturbance so great that he could no longer give rational orders, in fact, lost his head completely. Was he cowardly or ill, or both? Rather was he worthy of commendation for having gone to the end of his resources rather than desert his post. That would have been the verdict of Babinski and Dupré on the man who had twice returned to duty after being wounded, and who had suffered intensely since childhood with emotional crises, and it would have been rendered with equal justice on the wife, who, herself wounded, with superhuman calm helped to rescue and dress the wounds of those taken from the burning train, yet, at the end of two years, had not wholly succeeded in conquering the emotional effect which the merest worry, shock, or usual noise would produce. Wholly emotional and in no way hysterical was the *crise de nerfs*, the suffocation, the trembling, the weeping, the sudden anger, of which she was ashamed and strove in vain to subdue. The picture in no way resembled the state of the neurotic hysteric who has attacks when there are spectators, and whose symptoms quickly disappear when alone; who is cured by discreet persuasion (the pithiatism of Babinski) and who shows, as Dupré points out, *mythomania* in its *mythoplastic* form.

The necessity for sounder diagnosis of mental conditions is urged as particularly needed in these days when many men (and particularly women) are more or less liable to wander on to the borderland of insanity and be ignorantly labeled as cowardly, hysteric, or worse by ill informed alienists.

THE AWAKENING DESIRE FOR A SPECIAL ARMY CORPS.

The Committee on Military Affairs of the House of Representatives held a hearing on the Edmonds bill, H. R. No. 5531, on March 19th, when representatives of pharmaceutical organizations appeared from almost every section of the United States and of several medical organizations to urge the passage of the measure establishing a pharmaceutical corps in the United

States Army. Something like one hundred delegates were in attendance at the hearing, including representatives of a score of colleges of pharmacy.

The arguments put forth in favor of the creation of a corps of skilled pharmacists in the service were based on the ground that, lacking such a corps, the soldiers were receiving less expert care than they would receive in civil life, that the creation of this corps would set free for purely medical functions a considerable number of surgeons who are now performing the functions of medical purveyors and other administrative officers which might just as well, or better, be performed by expert pharmacists of the high type who would be brought into the service by the organization of such a corps, and whose services would be most helpful to the surgeons, enabling them to accomplish more and better work.

One of the most convincing arguments presented was that set forth by Dr. J. Madison Taylor, of Philadelphia, who argued in favor of the establishment of the proposed corps from the standpoint of the physician who understood the superior qualifications of modern, educated pharmacists and who wished the army surgeons to benefit by their knowledge and skill.

One phase of the statements made, which seemed to make some impression upon the members of the committee, was a brief summary of the facts regarding the pharmacists in the armies of foreign countries. It was stated that in the armies of all civilized countries, except England, there is an organized corps of expert pharmacists with commissioned rank. A brigadier general is at the head of this corps in France, and there is, or was before the war, a colonel in Germany, in Japan, and Spain. He is a lieutenant colonel in Italy, Belgium, Holland, and Austria, and a major in Switzerland, Norway, Sweden, and Australia, for, curiously enough, the Australian army and the Canadian army give commissions to pharmacists, though the English army does not do so, with the exception of the comparatively few who have commissions in the quartermaster's corps.

It is understood that the proposal to follow the precedent of our French allies in this phase of military organization, as we have in others, meets the approval of Major Franklin H. Martin, of the Council of National Defense; of Major William H. Mayo, and of Major Stewart McGuire, of the advisory surgical board of the Surgeon General's Office, and of many other distinguished members of the Medical Reserve Corps.

We are heartily in accord with this movement,

though the Edmonds bill should be amended in several particulars in order to bring it into closer accord with the existing organization of the medical department. Among other things, a provision should be made, and we are informed will be made, in the measure for retaining in the corps all the nonmedical officers who are now performing the duties which would be assigned to the pharmaceutical corps. This would provide for the retention of the division medical supply officers, many of whom have had long experience in the regular army as sergeants in the medical department. It would seem desirable also to have the director of the corps a colonel instead of a major as proposed in the Edmonds bill, also there should be some provision for designating the number of officers in the corps based on the proportion of officers to the combatant force just as there is in the medical corps. All these amendments will no doubt be incorporated in the measure by the Committee on Military Affairs, and we hope the committee will favorably recommend the bill after suitable revision, for the interests of soldiers and surgeons alike demand it.

ADENOIDS AND HEARING IN YOUNG CHILDREN.

The association of adenoids with impaired hearing in the young has been noticed by the careful otologist since the day when the deleterious effects of these postnasal vegetations upon the physical and mental growth of the child had become a well established and indisputable fact. This condition is not observed early enough and is by far more common as a cause of early deafness than is usually supposed. According to some authorities, e. g., Ballenger, sixty per cent. of all persons with hypertrophied adenoids in the pharynx have more or less interference with audition. Unfortunately neither the parents at home nor the teacher in school are in a condition to detect beginning deafness early enough, and the process becomes well established by the time a marked deficiency of hearing is either complained of by the child himself or becomes evident to those about him. Incipient deafness caused by adenoids is comparatively easy of detection if the child is found to be a mouth breather and a snorer and in more or less pronounced cases the possessor of the characteristic adenoid facies. On further inquiry the child is found to be somewhat dull in his school work, and unable to keep up with his classmates; a digital examination of the posterior pharynx, a procedure that can be accomplished rapidly and

with comparative absence of pain, will clinch the diagnosis of adenoids and make the probability of deafness due to their presence so much the stronger. Here the cooperation of the family physician with the specialist will prove of immense value in forestalling further defect and frequently inaugurate a complete cure and a possible return to the normal in cases where the condition has not lasted long enough to lead to organic changes. Every practising otologist can recall cases of deafness in adults in which the appearance of the drum, usually retracted with or without marked congestion of almost the entire membrane, does not suggest any nasopharyngeal obstruction or any other palpable causative agency, an old condition that originated in childhood and was either entirely neglected or not properly attended to. Here while the adenoid vegetations had entirely disappeared they usually atrophy at puberty, the effects produced by them in early life remain as more or less complete deafness.

Since the detection of adenoids and their removal in children is a comparatively easy matter, these cases should be taken in hand as soon as any degree of deficient hearing is manifest. While an adenectomy, especially with the aid of new instruments, is easily mastered, it should be remembered that the lymphoid mass pressing at the fossa of Rosenmüller is the chief offender in these cases, and therefore that space should be thoroughly cleared as well as the central portions of the pharyngeal wall. Failure to do this is often responsible for the so called return of the adenoids and the nonrelief of the aural condition of which the patient frequently complains. The treatment should be continued in an effort to restore the drum to normal condition through careful Politzerization or catheterization.

A GLIMPSE AT THE DOCTORS.

It seems a pity that the world should not know more of what the doctors are doing, and, to that end, we quote from a lengthy article in the pages of a contemporary.¹

A calm, dispassionate picture drawn by a doctor, of war, limping, bandaged, diseased, half fed, half crazy, is perhaps more striking than one given by a newspaper man, because the former is not seeking sensationalism but aiming at incisive truth telling. Two members of the American Red Cross Commission to Rumania graph-

¹Observations on Medical Conditions in Rumania. By Gifford Wells, M.D., and Rogers G. Peckham, M.D. *Memorial of the American Red Cross Commission to Rumania*, January 3, 1918, March 16, 1918.

ically picture what war really means when they show the Rumanians retreating from Bucharest before the Germans, with nearly a million refugees ahead to raid available supplies, refugees without food or clothing, many walking for twenty or thirty days, they with the retreating army and nearly a million Russians, becoming a heavy burden on Moldavia, a state not much larger than Massachusetts, with a population of nearly 2,800,000 souls. She was so far from the firing line that hospital shelters had not been erected, yet in surged the crowds of wounded and sick soldiers. Food became scarce, for railroads were elementary; oil for autos was in the captured territory; horses, estimated at some 3,000,000, had been sold to Russia and Germany before Rumania entered the war, and now sunk eyed Famine pointed her wasted finger at her companion Disease, summoning cholera first to begin the horrible work of decimation.

But here Science and heroic devotion take up the tale. Professor Cantacuzene had his anti-cholera vaccine station at Jassy, and, in spite of the prevailing cold and starvation, won out with the enemy. His trained staff were scattered throughout the country, and the tremendous value of a high grade bacteriologist has never been more strikingly proved.

Then, among the ever shifting and crowded soldiers and refugees, arose a deadlier enemy—typhus—though hitherto almost unknown endemically in Rumania. With this came also another louse borne disease, recurrent fever. The doctors fought grimly, but the simple weapons needed—baths, petroleum, fires, clean clothes—were generally lacking, and, worn out, 200 of the entire medical force of 1,200 fell victims to the disease. In the little city of Jassy as many as 500 persons died in one day. The stricken Moldavians fled hither and thither; stories are told which leave the imagination jaded in conceiving. Hospitals and barracks swarming with the sick who “perished pell mell in their fecal matter, lying on the ground, or at best on a bundle of straw. Men were on the beds and under the beds, huddled together for warmth,” thus giving easy progress to the loathsome louse. Soldiers, doctors, nurses, orderlies were infected, and so shorthanded were the staffs that at first the “treatment” consisted in removing the dead to make room for the living. In trainloads of those seeking flight the dead still stood upright in the densely packed cars, and many lay dying in the streets of starvation and exposure. Doctor Devaux, of Paris, who studied the epidemic at Jassy, says the nervous system was the most ex-

tensively affected; many of the deaths were due to bulbar paralysis. There were cases of actual hemiplegia and many of paralysis: nearly 200 of atrophy of the forearm with *main en griffe*. In cases of collapse with low blood pressure, epinephrin was used; the serum of convalescents could not be thoroughly tried out.

The heavy demand for army doctors has disorganized the old system, each district having a physician in chief with a staff of doctors under him, and the epidemics are smouldering, not eradicated. The lack of salvarsan for the recurrent fever added to the mortality, it being of great value in this spirochetal disease. Splendid efforts are now being made to keep the barracks free from lice, and the Rumanian soldier is a willing helper, having no objection to cleanliness, and skillful in building hospitals, baths, etc.

Typhoid has been fought with compulsory vaccination, its efficacy being shown from the fact that in one hospital one hundred cases were officers and only fifty-six among the privates, the former not compelled to be vaccinated. Flies seemed largely responsible. In some hospital typhoid and dysentery patients were lying with their faces, food, bedclothes, and often excreta swarming with flies, yet Science is slowly making headway, for even an ignorant peasant cannot deny obvious cures.

The commissioners sound one little note of cheer by telling that, at any rate, meningitis and poliomyelitis are not present, but the note dies away in a sigh when we learn that pellagra and a severe form of edema persist, and that, when the latter invades a pellagran, his fate is sealed. The disease is like a severe nephritis, but with an albumin free urine. The edema is chiefly in the face and hands and lower extremities, and exists *exclusively* among those suffering severe privations, so here Charity holds the bag, and Science folds her hands. Listen to her speaking through the doctors:

There were as many as “twenty in one room, dying solely of lack of food . . . Women and children swollen with famine dropsy, ulcerating with acute pellagra, emaciated to skeletons with dysentery. One dreads to contemplate what conditions will be when cold weather again comes.” “There is a terrific lack of suitable food and clothing.”

Then, again, a note of hope, if material help in the form of supplies and supplemental medical reinforcements can be assured to tide over evil times. The Rumanians are familiar with the situation and are competent to face it if helped—helped soon—for the death rate mounts slowly

over that of births, and these people are deserving of all we can give.

There is a modest ignoring of what the doctors and nurses did, and, just as we find it all out by drawing our own conclusions and are raising a great shout of applause, the commissioners again point to the Rumanians and ask whether "a nation which can arise from a crushed condition, fight through two such plagues as cholera and typhus, bear the burden of a vast, inert, hungry, foreign army, and with the aid of a thousand stimulating and inspiring Frenchmen reestablish itself so that, seven months later, it can hold off the concentrated attacks of Mackensen's army and pile up from 60,000 to 80,000 German casualties" is not entitled to all respect and help?

"JUST A FEW WORDS."

There is many a doctor called upon today to "speak just a few words" to associations, clubs, or schools, on what is popularly termed "the sex problem," whereupon he wrinkles his brows, suddenly realizing that his ideas are rather hazy and, taking from his shelves some leading writers on the subject, tries to put his own opinions into good form with the other man's ideas as mortar. But such volumes are not in every doctor's library, or, if there, he generally has to blow the dust off before using them, because they are more read by the terribly in earnest, inquisitive layman than by the average general practitioner.

An occasional article in the weekly medical journals serves to keep the subject before him and to solidify some experiences he may recently have had with young patients, and it is just with this idea in mind that we give, from time to time, a helpful paper for his use. The adjectives, such as "indelicate," "naughty," "coarse," deemed in early Victorian days fit to precede the sex question, have all been blown away by the sprightly breezes of common sense. Shocked whispers are superseded by shouts of indignation at the havoc wrought by guilty silence, even the term "problem" is expiring, because we have discovered it never was one, but simply a barrier foolishly erected across the gate of life through which the pure and innocent babies come to find themselves among a people holding meetings to decide whether their coming is a fit subject for discussion among pureminded persons. Nice for the babies?

Obituary

LIEUTENANT COLONEL WILLIAM W.
RENO, M. C., U. S. A.

Information has been received to the effect that Lieutenant Colonel William W. Reno, M. C., U. S. A., was lost at sea from the United States ship *Susquehanna*, March 21st, while en route to the United States. When Colonel Reno disappeared from the ship boats were lowered and a careful

search made without finding any trace of the body. He was born in Indiana on May 10, 1872, received the degree of A. B. from the University of Kansas in 1893 and that of M. D. from the College of Medicine and Surgery of the University of Michigan in 1900. He entered the army as assistant surgeon in 1901, became captain in 1906, major in 1910 and lieutenant colonel in 1917. Colonel Reno had made a special study of army organization and more particularly of the work of the field hospital. He was stationed at Fort Riley as instructor in field hospital work until the fall of 1917, when he was sent to France as inspector of field hospitals at the front. Colonel Reno was a clear and forceful writer and contributed a series of very interesting articles on the organization of the United States Army to the *NEW YORK MEDICAL JOURNAL* last year. His death will inflict a serious loss upon the service.

News Items.

Nurses Ask for Military Rank.—A bill is now before the House Committee on Military Affairs giving military rank ranging from second lieutenant to major to the nurses in the United States Army Nurse Corps. Active propaganda in favor of this movement has been inaugurated by the Committee on Nursing of the Master's Committee of Women on National Defense of New York.

American Red Cross Contributes \$500,000 to Canadian Organization.—The war council of the American Red Cross has appropriated \$500,000 as a gift to the Canadian Red Cross, in recognition of the part Canada has played in the war. The gift is made without restrictions, but with the expressed hope that it will be possible to use the contribution for the relief of Canadian soldiers at the front.

Base Hospital on Staten Island to Be Enlarged.—Plans have been filed which provide for the enlargement of the United States Base Hospital at Fox Hills, Staten Island, to twice its present size. When completed the institution will have accommodations for 6,000 soldiers. The eleven original buildings, which will accommodate 3,000 men, have been completed. Besides the three additional large buildings, a number of small buildings will be erected. About 250 acres of land have been acquired by the government for the hospital.

Eliminating the Unfit Army Doctor.—Surgeon General Gorgas has undertaken to eliminate all those from the Army Medical Reserve Corps who are unfitted by health or by not possessing some quality absolutely necessary for efficient work in war time. Some are too old, some too young, to submit to hardships in the way of strict discipline and cordial relations with the Regular Medical Corps. Also, many men whose health permits of good work in a particular climate rapidly go down hill when placed in camps on Texan deserts or when exposed to extreme cold and damp in the north. The "weeding out" may involve some fifteen hundred doctors.

A Year of War.—During the past year of war the Medical Department of the United States Army has increased its hospitals in the United States from seven to fifty-three with a bed capacity of 58,400; in France from nothing to 1,000, and capacity of 1,000,000; and increased the strength of the expeditionary force. The number of medical officers has been increased from 900 to 10,000 and of nurses from 375 to 7,000 and the total strength from 8,000 to 106,000. The army laboratories have been increased from 112 to 650, the medical training schools have been founded and built up to a number of 100,000 men. One hundred and fifty thousand psychological examinations have been made and \$95,000,000 expended by the Medical Department. The department has examined over 2,000,000 men and has reduced the death rate from disease to 6.6 per thousand, which is lower than the death rate for men of the same age in civil life.

Philadelphia Physicians' Liberty Bond Committee.—The government has appointed the following committee to promote the sale of liberty bonds to the medical profession in Philadelphia: Dr. William Duffield Robinson, chairman; Dr. T. H. Carmichael, Dr. Solomon Solis Cohen, Dr. Judson Daland, Dr. John B. Deaver, Dr. Frank C. Hammond, Dr. Hobart A. Hare, Dr. William E. Hughes, Dr. W. W. Keen, Dr. Wilmer Krusen, Dr. Ernest LaPlace, Dr. W. B. Van Lennep, Dr. Edward Martin, Dr. D. J. McCarthy, Dr. W. C. Posey, Dr. McCluney Radcliff, Dr. J. F. Schamberg.

Women Bacteriologists Wanted.—Announcement is made that about one hundred women bacteriologists are needed in the cantonment laboratories, to take the place of men who are going abroad with hospital units. Applications are being received from all camps, some asking for as many as nine women. A good practical knowledge of clinical pathology and bacteriology is needed for the work. The present salary is \$720 with maintenance and \$1,000 without, with transportation furnished by the government. Application should be made to the office of the Surgeon General, Washington, D. C.

Medical Association of the Greater City of New York.—A stated meeting of the association will be held in Du Bois Hall, New York Academy of Medicine, Monday evening, April 15th. Dr. John Coriss will read a paper on Papillary Cystadenoma of the Ovary, which will be discussed by Dr. Thompson T. Sweeney and Dr. Frank R. Oastler. Dr. A. F. R. Andresen will report a case of syphilis of the stomach, illustrating it with lantern slides; Dr. William A. Downes will discuss it. Dr. Tasker Howard will present a paper entitled Some Types of Nephritis, based on a study of sixty-six cases; Dr. Austin W. Hollis, Dr. Lewis Fox Frissell, and Dr. A. A. Epstein will discuss it.

Meetings of Medical Societies to Be Held in New York during the Coming Week.—Monday, April 15th, New York Academy of Medicine (Section in Ophthalmology), Yorkville Medical Society, Medical Association of the Greater City of New York, Psychiatric Society of Ward's Island; Tuesday, April 16th, New York Academy of Medicine (Section in Medicine), Tri-Professional Medical Society of New York, Federation of Medical Economic Leagues of New York; Wednesday, April 17th, New York Academy of Medicine (Section in Genitourinary Diseases), Alumni Association of City Hospital, New York, Women's Medical Association of New York City (New York Academy of Medicine), Medicolegal Society, New York, Bronx County Medical Society; Thursday, April 18, New York Academy of Medicine (stated meeting), German Medical Society, Brooklyn, New York Celtic Medical Society; Friday, April 19th, New York Academy of Medicine (Section in Orthopedic Surgery), Clinical Society of the New York Post-Graduate Medical School and Hospital, New York Microscopical Society; Saturday, April 20th.

Physicians Wanted in the City Service.—The Municipal Civil Service Commission announces three important medical examinations for which applications will be received at Room 1400, Municipal Building, Manhattan. Applicants must be citizens of the United States and residents of the State of New York.

Assistant Medical Examiner.—The duties of this position include making investigations of violent and suspicious deaths and to perform autopsies in connection with such investigations. There are at present two vacancies in the office of the Chief Medical Examiner. The position pays a salary of \$3,000 a year.

Deputy Medical Superintendent, Grade 3 and 4.—The duties are to perform such details of supervisory work in the management and control of a large hospital or a group of hospitals as may be assigned by the medical superintendent or to act as a superintendent of a small hospital. There are two vacancies in the Department of Charities, at salaries of \$2,520 a year with maintenance—*at Sea View Hospital (exclusively for tuberculosis) and at Cumberland Street Hospital.*

Pathologist.—The duties of this position require the exercising of independent judgment in and responsibility for pathological examinations and the performing of research work under supervision. There are three vacancies in the office of chief medical officer; salary \$1,920 a year. For further particulars apply to the Municipal Civil Service Commission, Room 1400, Municipal Building.

Personal.—Dr. William B. Noyes announces that he has resumed practice at 616 Madison Avenue, New York, after six months' service in the Medical Reserve Corps, United States Army.

Dr. George H. Meeker, of Philadelphia, has been appointed dean of the Polyclinic Department of the Post-Graduate School of the University of Pennsylvania.

Dr. Benjamin Franklin Royer, who has been chief medical inspector of the Pennsylvania State Department of Health for a number of years, has been appointed acting health commissioner, pending the selection of a permanent successor to the late Dr. Samuel G. Dixon.

Meetings of Medical Societies to Be Held in Philadelphia during the Coming Week.—Monday, April 15th, Academy of Medicine and Allied Sciences, Blockley Medical Society, Medical Society of Woman's Hospital; Tuesday, April 16th, Mt. Sinai Hospital Clinical Society, West Branch of the County Medical Society; Wednesday, April 17th, County Medical Society (business meeting), Section in Otology and Laryngology of the College of Physicians; Thursday, April 18th, Northeast Branch of the County Medical Society, Academy of Stomatology, Section in Ophthalmology of the College of Physicians, Southeast Branch of the County Medical Society; Friday, April 19th, Logan Medical Association.

Number of Physicians Recommended for Commissions in Army Medical Reserve Corps.—The following table compiled in the Surgeon General's Office, Washington, D. C., shows the number of physicians recommended by Surgeon General Gorgas for commissions in the Medical Reserve Corps, also the relative rank of the states in responding to the call:

State.	Number of physicians in state.	Number recommended March 1, 1918.	Per cent.	Rank of state in list.
Alabama	2,568	326	12.7	49
Arizona	307	70	22.8	2
Arkansas	2,637	104	7.4	49
California	5,637	783	13.8	30
Colorado	1,233	181	14.6	47
Connecticut	1,678	232	13.8	20
Delaware	261	35	13.4	32
District of Columbia	1,482	236	15.9	18
Florida	1,321	172	12.9	51
Georgia	3,421	446	13.0	38
Idaho	439	70	15.9	19
Illinois	10,648	1,686	15.8	20
Indiana	4,872	610	12.5	44
Iowa	3,751	456	12.1	44
Kansas	2,683	385	14.3	25
Kentucky	3,584	598	16.7	17
Louisiana	2,060	287	13.9	28
Maine	1,205	142	11.8	46
Maryland	2,048	267	13.0	37
Massachusetts	5,689	804	14.1	26
Michigan	4,360	756	17.3	16
Minnesota	2,447	445	18.2	7
Mississippi	2,048	267	13.0	37
Missouri	6,300	904	14.1	27
Montana	636	132	20.8	3
Nebraska	1,911	337	17.6	9
Nevada	184	37	20.0	1
New Hampshire	690	84	12.2	43
New Jersey	3,239	544	16.8	16
New Mexico	430	63	14.7	23
New York	15,670	2,687	17.0	15
North Carolina	2,102	358	17.0	14
North Dakota	586	101	17.2	12
Ohio	8,045	1,011	12.6	41
Oklahoma	2,614	317	12.0	45
Oregon	1,837	230	12.5	36
Pennsylvania	11,502	2,278	19.8	4
Rhode Island	772	103	13.3	36
South Carolina	1,300	187	14.3	33
South Dakota	676	98	14.5	24
Tennessee	3,457	463	13.4	34
Texas	6,230	832	13.3	35
Utah	465	71	15.3	22
Vermont	668	86	12.9	39
Virginia	2,547	393	15.4	21
Washington	1,695	302	17.8	8
West Virginia	1,720	233	13.5	31
Wisconsin	2,803	481	17.2	13
Wyoming	251	23	9.2	48

On March 1st there were 144,866 physicians in the forty-eight States and District of Columbia. The Surgeon General's report for March 22d gives a total of 181,138 officers in the Medical Reserve Corps, and of these 14,911 are on active duty. Weekly reports indicate that the officers are being called to active duty in greater numbers than they are being admitted to the Reserve Corps. In all, 22,309 doctors have been recommended by the Surgeon General to the Adjutant General's Office for commissions in the Medical Reserve Corps—fifteen per cent. of the doctors of the country.

Modern Treatment and Preventive Medicine

A Compendium of Therapeutics and Prophylaxis, Original and Adapted

THE TREATMENT OF HEMOPHILIA.

By LOUIS T. DE M. SAJOUS, B. S., M. D.,
Philadelphia.

(Continued from page 661.)

According to recent observations, summarized in the preceding issue, administration of calcium in hemophilia is definitely indicated only in a small proportion of cases, those in which there appears to be an actual deficit of calcium in the blood stream. The tests necessary for the detection of this deficit in a given case not being, however, feasible in practice, tentative use of calcium even in the absence of this definite indication is often justifiable; the effects of the doses given on the hemorrhagic tendency should in so far as possible be continuously traced, the fact being borne in mind that in excess the calcium salts may lengthen instead of shortening the coagulation time.

What of the internal or hypodermic use of gelatin in hemophilia? A number of observers, albeit not very recently, have reported isolated cases in which gelatin appeared to exert a definite effect in arresting obstinate hemophilic bleeding. C. H. Hare, 1901, reported the case of a girl of thirteen, belonging to a family of bleeders and subject to severe attacks of epistaxis, who was seen in extremis at her first menstruation, which had continued unchecked for two weeks. As a last resort, a half pint of a one per cent. solution of sterilized gelatin was injected twice on the same day under the breast. The hemorrhage ceased and recovery followed. Similarly Heymann, 1899, reported the case of a bleeder aged twenty-three years in whom removal of adenoids was followed by obstinate hemorrhage, various usual remedies and anterior and posterior plugging all proving vain. Finally 140 mils of a two and a half per cent. neutral, sterile solution of gelatin in normal saline fluid was injected under the skin of the chest. The bleeding thereafter dwindled, and ceased altogether in forty-five minutes. Subsequent removal of plugs on two occasions resulted in return of bleeding, but after repeated gelatin injections this difficulty was at last overcome. An actual effect of the repeated injections seemed substantiated by the progressively decreasing amount of hemorrhage from the site of injection, application of adhesive at the time of the first injection proving feasible only after steady local pressure for fifteen minutes, whereas, by the third injection the bleeding was controlled immediately by application of adhesive. E. Hahn, 1900, reported a case of inherited hemophilia, with frequent and obstinate epistaxis and prolonged bleeding after the extraction of a tooth, in whom copious renal hemorrhage set in and resulted in extreme pallor and debility. After ineffectual treatment by rest in bed, a milk diet, and ferric chloride for two weeks, the patient was given gelatin, six to eight ounces daily by mouth. Next day marked lessening of the hemorrhage was noted and within forty-eight hours the bleeding had

stopped. The gelatin was continued two weeks, and the urine remained permanently free of blood. Many other analogous observations might be mentioned.

There is thus at least some evidence that gelatin may favor arrest of bleeding where blood coagulability is deficient, though by some it is considered ineffectual. Karchesy a number of years ago tested out the value of hypodermic injections of gelatin for lessening parenchymatous hemorrhage in surgical work. Two hundred grams of a two per cent. solution of gelatin in normal saline fluid were injected into the thigh one hour before anesthesia. The result is asserted to have been wounds much drier than usual, with marked reduction of oozing and rapid clot formation. The action of the gelatin seemed but temporary, however, necessitating undiminished care for the prevention of secondary hemorrhage. Again, Chaput, in 1909, reported good results from gelatin injections in the treatment of postoperative secondary hemorrhage.

Experimental evidence of the action of gelatin on coagulability is likewise not lacking. H. C. Wood, 1902, observed regularly a shortening of coagulation time and reduction of bleeding from cut arteries upon administration of gelatin by mouth to dogs. Grau, 1910, after injections of sterilized gelatin, usually noted a decrease of at least sixty-six per cent. in the clotting time, and in isolated cases, of eighty-five per cent. The effect attained its maximum ten to twelve hours after the injection and persisted for several days. The cause of the action of gelatin on coagulability has been repeatedly studied, but as yet without any positive conclusion. It is at present ascribed by many to an increase of the viscosity of the blood. While Zibell, 1901, attributed the effect to the presence of 0.6 per cent. of calcium in gelatin, Burton-Opitz, 1906, noticed an increase of blood viscosity after intravenous administration of gelatin, and according to Cmunt, 1912, gelatin causes increased viscosity especially when given under the skin. The last named author upon hypodermic use observed an increase of viscosity by 140 per cent. in twenty-four hours, and upon internal administration an increase by sixty per cent. in ten days. Boggs, according to Pratt, 1915, failed to show experimentally that gelatin reduces the coagulation time of the blood, thus apparently contradicting Woods's earlier conclusion. Even granting, however, the accuracy of Boggs's view in regard to the coagulation time as estimated with the Boggs coagulometre, these observations seemingly do not disprove the property of gelatin to favor clotting in the presence of hemorrhage, for in the Boggs apparatus the blood is most of the time at rest during the process of coagulation, whereas in hemorrhage the constant *vis a tergo* must in addition be antagonized during coagulation, and the increased viscosity of the blood shown, has an opportunity to exert a favorable influence which is not presented in the Boggs apparatus.

An objection to the hypodermic use of gelatin, unless carried out with strict precautions, is the risk of infection. When gelatin was first introduced, cases of abscess or even fatal tetanus, were met with and traced to bacteria or spores contained in it. Specially prepared sterile gelatin should therefore be employed where such injections are to be given. The solution used may be of one to ten per cent. strength, preferably the latter, according to Heddaeus, 1908, who also specifies that the amount of gelatin given at a dose should be not less than two grams. The tetanus spores which gelatin may contain are destroyed only at a very high temperature, and where a sterile solution is not obtainable, internal administration is safer, and, according to Wood, equally effective, though slower in action. The oral dosage recommended by Wood is three or four ounces of a ten per cent. jelly three times a day. The fact should be mentioned that, according to some, the change undergone by gelatin through digestion in the alimentary canal renders it nonhemostatic.

Other objections to gelatin hypodermically are, local pain occasioned, rise in temperature which sometimes follows, and the difficulty which in severe cases may be experienced in controlling hemorrhage at the point of injection. Engelmann, 1910, advises the application of warm, moist dressings to accelerate absorption and reduce irritation.

On the whole, it must be recognized that systemic use of gelatin is by no means a certain therapeutic measure, though sometimes good results follow, at least, temporarily. For certain other measures, to be taken up in the next issue, gelatin is but an inferior substitute; it may be looked upon as an auxiliary remedy, or one available where these other measures cannot be applied.

(To be continued.)

Pituitrin: Its Value in Postoperative Treatment.—Neville Davis and Robert Owens (*New Orleans Medical and Surgical Journal*, March, 1918) make the following claims: That pituitrin is a valuable drug in stimulating the muscular coat of the intestine after abdominal section in nonseptic cases. That it is of decided assistance in preventing postoperative shock after abdominal section in nonseptic cases, as evidenced by the lack of rise of temperature and pulse rate. That it had very little, if any, effect upon cases complicated by septic peritonitis, but the small number of cases makes the results observed inconclusive. That it stimulates the secretory action of the kidneys in cases of eclampsia. That it materially reduces the amount of postoperative suffering. As regards the use of the drug to shorten the time of labor, they have long abandoned it, for their experience has shown it to be as dangerous as ergot, that it should not be used until after the expulsion of the placenta, and then only to anticipate postpartum hemorrhage. Their method of using pituitrin in surgical cases is: Morphine grain 1/6 and atropine grain 1/180 given hypodermically one hour before operation. Immediately after operation, before the patient is returned to bed, 1 c. c. of pituitrin hypodermically. This dose is repeated two hours later. Four hours

after the operation half a c. c. is given, and eight hours after the operation another half c. c. Unless the case was one that involved considerable handling of the abdominal viscera, no more is given, but in these severe operations doses of half a c. c. are continued every four hours until twenty-four hours after the operation. Twenty-four hours after the operation they give half a grain of calomel every half hour until three grains have been taken, and then a saline purgative to prevent cramping. To avoid actual colic they give an enema four hours after the saline purge. They report a series of 126 cases, 104 nonseptic, twenty-two septic. The results certainly seem to have been good.

Solvents for Dichloramine-T.—H. D. Dakin and E. K. Dunham (*British Medical Journal*, January 12, 1918) emphasize the fact that while this substance is freely soluble in most organic solvents the selection of a suitable one is a matter of considerable difficulty. This is due to the fact that many of the solvents favor the rapid decomposition of the dichloramine, while others prove too irritant for use on wounds or the mucous membranes. After very extensive experimentation a chlorinated paraffin wax oil emerges as the most satisfactory. This is called "Chlorcosane" as a convenient descriptive name. It is readily prepared from available and cheap constituents, has a viscosity between that of olive and that of castor oil, is perfectly bland, dissolves dichloramine-T up to ten per cent. and the solution retains its activity for two months if stored at room temperature in amber bottles. The method of preparation of chlorcosane is described. The chlorcosane solution of dichloramine is suitable for application to wounds and can be nebulized by a power spray, but is somewhat too viscid for use in a hand spray.

Urinary Antiseptis.—Edwin G. Davis (*Journal A. M. A.*, March 2, 1918) states that the ideal urinary antiseptic must be chemically stable, non-toxic and nonirritating to the lower urinary passages; it must be antiseptic in high dilution in urine as well as water, and it must be eliminated unchanged by the kidney and in high percentage. No such drug as this is known, but phenolsulphonaphthalein nearly fulfills all requirements except that it has no antiseptic power. Experiments with about 195 derivatives of phenolsulphonaphthalein and allied substances show that the metallic salts of the phenolsulphonaphthalein offer no promise of being of value as urinary antiseptics. Several other sulphonaphthaleins are excreted rapidly by the kidneys, others are not, and none is of value as a urinary antiseptic, since the only one which is excreted rapidly is not germicidal. The halogenated sulphonaphthaleins do not promise to be of any value, and the same is true of the phthaleins themselves. Certain of the xanthones are very rapidly excreted by the kidneys and of these rhodamin is antiseptic in water but loses this property in urine. The experiments have not as yet yielded any satisfactory urinary antiseptic but they point the way to the ultimate elaboration of one. They also show the marked property of the urine to prevent the antiseptic action of many substances which prove strongly antiseptic in water.

Etiology of Diabetes Mellitus.—R. T. Williamson (*British Medical Journal*, February 2, 1918) lays great emphasis upon three general factors which seem to play an important rôle, at least as predisposing causes, in the production of diabetes mellitus. These are: habitual consumption of sugar and sweets; prolonged and intense mental anxiety, worry, overstrain, or sudden shock; a family history of diabetes. The importance of these three factors is brought out by an analysis of a series of 300 cases. A history of prolonged use of a great excess of sugar was obtained in ninety-three cases, or thirty-one per cent., and in forty cases this was the only one of the three factors present. In 120 cases, or forty per cent., diabetes followed directly upon intense and prolonged mental strain, anxiety, or worry, or after sudden severe shock; the latter occurring in thirteen of the cases. In this group of 120 cases the strain, anxiety, or shock was the only predisposing cause in sixty-one cases, while in twenty-five others it occurred in persons with a family history of diabetes. Twenty-five per cent. of the 300 cases gave a family history of diabetes. In the whole 300 cases only nineteen per cent. failed to give a history of one or more of these three factors. The recent food restrictions as to the use of sugar should tend to diminish the incidence of diabetes, but the mental anxiety and the large amount of overstrain may in a large measure counteract this beneficial effect. The recognition of these important predisposing causes provides methods of prophylactic attack in the prevention of diabetes.

Predisposing Factors of War Psychoneuroses.—Julian M. Wolfsohn (*Lancet*, February 2, 1918) sought to determine the true importance of previous nervous unsoundness as a predisposing factor in the development of the various war psychoneuroses by subjecting a group of 100 unselected cases of such psychoneuroses to critical study of their past personal and family histories. As a control a group of 100 surgical cases in soldiers who did not develop psychoneuroses was similarly analyzed. The comparative results showed strikingly the very great importance of previous personal instability in the family history. Thus in the psychoneurotic group (Group A) sixty-four per cent. gave a strong family history of nervousness, as compared with only fifteen per cent. with such history in the non-neurotic group (Group B). Group A also gave a family history of alcoholism in fifty per cent., of irritability of temper in thirty-six per cent., of insanity in thirty-four per cent., of epilepsy in thirty per cent., of stigmata of degeneration in ten per cent., and of one or more of the above in seventy-four per cent.; as contrasted with twenty-four per cent. of alcoholism, twelve per cent. of irritable temper, no insanity or epilepsy, no stigmata, and one or more of these factors in only thirty-eight per cent. among the men of Group B. The comparative results were even more striking in the case of personal histories of the two groups of men. Finally, the element of acquired neurotic instability, as the result of strain and the conditions of life, was found to play a relatively small part in the production of war psychoneurosis.

A Method for Producing a Rapid Immunity to Pneumococci.—H. L. Alexander (*The Journal of Medical Research*, January, 1918) produced a potent antipneumococcus serum rapidly in rabbits by the use of antigens containing large numbers of living pneumococci, which were first sensitized, and then incubated with leucocytes. Their viability after this treatment was demonstrated, as they grew well on broth and blood agar. By this method protective substances in considerable amounts were produced in the blood serum of rabbits within six to eleven days after the first injection of the antigen, as contrasted with other methods requiring weeks or months for the production of an antipneumococcus serum of like potency. The protection is not obtained so quickly with similar antigens containing killed organisms, or in the absence of the leucocytes. Apparently there is no increase in protective bodies after three series of injections. Experiments made to determine whether long incubations would produce a more effective antigen showed that this resulted in acute protein poisoning. The analogy is pointed out between this rapid immunization and the production of protective substances within a short time in pneumonia patients at about the time of the crisis.

Local Heat and Metallic Copper in Surgical Tuberculosis.—Berthier (*Journal de médecine de Paris*, January, 1918) points out that, in conjunction with the tubercle bacillus, tuberculous disease may be considered as the result of a process of local anemia or obliteration of the vessels. Stenosis of the pulmonary artery terminates in phthisis, while mitral stenosis, causing congestion of lung parenchyma, tends to restrict tuberculous disease. In surgical tuberculosis the author attempts, therefore, to excite the circulation locally by the use of heat, thus provoking more active vascularization. For this purpose a flexible thermophile or heat conducting tissue is used, which adapts itself closely to the shape of any area of the body measuring up to thirty by forty centimetres, and is applied over a few layers of gauze. Upon heating with the electric current the temperature rises in a few minutes to 50°, 60°, 70°, or even 80° C. A thermometer passed permits watching the temperature attained. The heat is applied daily or on alternate days for ten to twenty minutes, according to the persistency of the vascular reaction provoked. Above 50° C. the virulence of the tubercle bacillus begins to be impaired, and phagocytosis, favored by the increase of local circulation, becomes correspondingly more effective. For bony and lymphatic involvements, the optimum temperature is 50° to 70°. Into the depths of sinuses or at the surface of open lesions, powdered metallic copper in small amount is placed every two to four days. The resulting nascent copper chloride exerts a distinct antiseptic effect, and progressive improvement in the local condition is noted. Luton, a few years ago, maintained that copper acetophosphate would cure tuberculosis. In Berthier's hands the treatment proved especially effective in tuberculous glandular involvements. For small areas, the electrically heated tissue was sometimes replaced by small sacs of sand at 50° to 70° C., with satisfactory results.

The Pathological Uterus at the Menopause.—

Charles R. Robins (*American Journal of the Medical Sciences*, March, 1918) is of the opinion that in cases favorable for cure from operation it is not always possible to make an exact diagnosis; that in our efforts to make our diagnosis exact we are liable to lose the advantage of an early operation by our efforts to secure tissue for examination, in this way disseminating cells and stimulating vicious growth; that a pathological uterus at the menopause is potentially a malignant one, and that even if cancer is not already present it may develop later. Consequently he advocates total abdominal hysterectomy as the operation of election in the pathological uterus at the menopause as the surest protection to women from cancer.

Urinary Infections of Pregnancy and the Puerperium.—F. H. Smith (*American Journal of the Medical Sciences*, March, 1918), says that when a pregnant or puerperal woman has any fever a catheterized specimen of urine should be obtained at the first visit. If the urine is cloudy, acid, and albuminous, infection of the higher urinary tract should be suspected and a microscopic examination made before any other diagnosis is accepted. Clinical signs may be most confusing, without or with laboratory aid, and especially are we apt to miscall the case appendicitis. The treatment recommended is rapid alkalization of the urine with potassium citrate, and the use of a "sensitized" vaccine of the colon bacillus, because it can be sooner given than an autogenous vaccine, which should be prepared as soon as possible and then administered. Mere persistence of pyuria is to be expected and need cause no alarm if there is no fever, leucocytosis, or other symptoms, but, if stormy symptoms persist, the patient needs irrigation of the kidney pelvis, or possibly nephrotomy or nephrectomy.

Frontal Sinus Operation Performed under Local Anesthesia.—M. P. Boebinger (*New Orleans Medical and Surgical Journal*, March, 1918) thus describes the preparation and anesthetization of his patient. Quarter of a grain of morphine was injected fifteen minutes before operation. Pledgets of cotton were introduced into each nasal chamber after being soaked with a ten per cent. solution of cocaine and adrenalin 1-1000. After an interval of fifteen minutes the cotton was removed and the mucosa about the frontal openings, the middle turbinate, and the anterior wall of the sphenoid was rubbed several times with a swab wet with the same solution. A Mosher operation was then performed on the ethmoid, modified so as to include removal of the middle turbinate and of the anterior wall of the sphenoid. The upper septum was next well swabbed with cocaine and adrenalin, and after an interval of ten minutes one dram of a one quarter per cent. solution of novocain was injected high up into the septum, just beneath the floor of the frontal sinus. The skin and unshaven eyebrow were cleansed with alcohol and iodine, after which one dram of the same solution of novocain was injected beneath the skin of the eyebrow, about quarter of an inch from its mesial margin, then deeper into the superficial tissue, and finally beneath the periosteum. The supraorbital, supratrochlear, and

infratrochlear branches were then injected. The entire anesthesia about the frontal sinus externally was done through a single skin puncture, with a two inch needle, withdrawing the needle just far enough to inject each succeeding area, but not out of the skin. No pain was felt by the patient during the operation, no postoperative nausea was experienced, and the patient was up and about earlier than when general anesthesia is employed. It was unnecessary to cocaineize the mucosa of the frontal sinus, no postnasal pack was necessary, and there was very little reaction about the eyelid.

Action of Ethyl Alcohol on the Respiratory Centre.—D. R. Hooker (*Journal of Pharmacology and Experimental Therapeutics*, August, 1917) reports experiments in which this question was studied by perfusion of very dilute alcohol solutions through the mammalian medulla. This method brought the alcohol in contact with the nerve cells very promptly and ensured that the results obtained should represent the direct response of the centres. The perfusion fluid consisted of defibrinated blood with alcohol added. Addition of 0.025 per cent. of alcohol was found to stimulate respiration. When the amount was increased to 0.1 per cent. the respiratory response was greater than before. When, however, it was further increased to 0.2 per cent., a transitory stimulation occurred followed by prolonged inhibition of respiration. Concomitant observations on the heart rate and arterial blood pressure indicated that the former is not affected while the latter is raised under the influence of alcohol.

Studies of Oxygen in the Venous Blood.—Christen Lundsgaard (*Journal of Experimental Medicine*, February, 1918) reports preliminary investigations on the oxygen unsaturation in patients with circulatory disturbances. The difference between the total oxygen capacity of the hemoglobin and the oxygen in the venous blood, the oxygen unsaturation, is calculated. Thirty-one determinations were made on sixteen patients who were divided into two groups—those with clinically compensated heart lesions and those with uncompensated circulatory disturbances. In the first group the oxygen unsaturation of the venous blood was found within normal limits, while the figures for the second group are all above the upper normal limit, ranging from 9.7 to 15.2 volume per cent. The author hopes to fix the limits of the oxygen unsaturation in people with normal circulation and lungs, and study the variations in carefully controlled patients with symptoms of abnormal circulation and abnormal respiration. From these observations the figures for the oxygen unsaturation may be arbitrarily standardized, the pathological conditions affecting it may be ascertained, and a new link will thus be forged in the clinician's chain of accurate diagnosis.

Following this paper are two others by the same author dealing with the determinations of oxygen in the venous blood of five patients with compensated circulatory disturbances and of five patients with uncompensated circulatory disturbances. In each case the history, physical examination on admission, and treatment are fully described.

Miscellany from Home and Foreign Journals

Detection of Pretended Loss of Hearing.—R. R. Brownfield (*Jour. A. M. A.*, March 2, 1918) emphasizes the great difficulty of proving the falsity of claims of partial or complete unilateral loss of hearing, and the fact that there is no satisfactory apparatus by which the determination can be made. Further, the prodigal use of high explosives in the present war makes the need for some means of detecting frauds with reference to loss of hearing more than ever necessary. An apparatus is described by which fraud can be detected and precise measurements of the acuity of hearing made with ease and certainty. It consists of a telephonic sound producer in which the intensity of sound can be regulated to a nicety over a very wide range; a second similar sound producer in which the sound is of precisely the same pitch and quality as in the first, but in which it is always maximal; and of a potentiometer and scale for the exact regulation of the sound in the variable producer. In ordinary tests of acuity of hearing only the variable producer is used and the precise acuity is readily measured for each ear in turn. In the case of feigned complete or partial unilateral deafness the patient holds the maximal sound producer over his alleged deaf ear and the variable over the good ear. The sound is begun in the variable at the lowest point and slowly increased until the patient says he can hear it with his good ear. If there is feigned deafness this will be at a point of intensity nearly equal to that of the sound in the maximal producer. If there is true deafness in one ear the acuity of hearing in the other is easily measured. A complete description of the apparatus is given, along with the methods of using it.

Eye and Ear Complications in Cerebrospinal Meningitis.—P. Zarzycki (*Bulletin de l'Académie de médecine*, December 18, 1917) asserts that these complications occur more frequently than is generally realized, viz., in about fifteen per cent. of all cases. Some of the orbitoophthalmic complications, e. g., conjunctivitis, keratitis, corneal ulcer, dacryocystitis, and orbital phlegmons starting in the accessory sinuses, appear to arise by direct transmission of germs from the nose and pharynx. Others, e. g., certain cases of iritis or iridochoroiditis, metastatic ophthalmia,* and thrombosis of vessels, arise by transmission through vascular channels. Finally, some are transmitted along nerves, retrobulbar neuritis, papillary stasis, optic neuritis, and neuroretinitis. Central involvements, comprising ocular paralyses, nystagmus, muscle contractures, pupillary disturbances, and disturbances of the visual field, seem to result from inflammatory changes in the cerebral visual mechanism or cortical disease. Similar considerations apply in middle ear involvements of pharyngeal origin and in internal involvements of central origin. During an epidemic all suspicious eye or ear lesions should be examined bacteriologically and treated with serum if the meningococcus is found. The eye examination should be directed to the inner membranes, the musculature, the functions of the iris, the appearance of the anterior and posterior chambers, and

especially the nerve head and retina. The ear, in spite of an intact drum membrane, may show hyperemia in the posterior quadrant of the tympanum and the neighboring posterior portion of the auditory canal—a condition due probably to vasomotor paralysis the result of labyrinth involvement. For conjunctivitis, keratitis, etc., a few drops of antimeningococcal serum should be instilled in the lower conjunctival cul-de-sac and serum or Vincent's mixture sprayed into the nose. For dacryocystitis, polyvalent serum should be injected into the lachrymal sac with Anel's syringe. For iritis, iridochoroiditis, and metastatic ophthalmia, subconjunctival serum injections are indicated. In middle ear involvements, with mastoid reaction, wicks dipped in serum should be introduced in the meatus and subcutaneous injections of serum administered in the mastoid region. For central ocular or labyrinth involvements, systemic treatment is alone available.

Cerebral Tetanus.—L. Bérard and A. Lumière (*Bulletin de l'Académie de médecine*, December 18, 1917) refer to the recognized view that tetanus spares the cerebral centres and that the absence of mental disturbance is of import in the differentiation of tetanus from meningitis. In the last year, however, they have encountered eleven cases of tetanus with cerebral disturbance, all in patients who had already received one or several injections of antitetanic serum. Most of the cases were instances of late tetanus, the first symptoms appearing in a period ranging from twenty-two to seventy days in eight of the eleven patients. The cerebral disturbances generally appeared only one or two weeks after the contractures. The interval between the first tetanus symptoms and the cerebral involvement ranged from seven to thirty days in no less than nine of the eleven cases. Five had no trismus and five others only slight trismus. The single case which died was that with the shortest incubation period—ten days—and with the shortest interval—five days—between the contractures and the cerebral symptoms. The latter comprised hallucinations, delirium, restlessness and morbid fear with nocturnal exacerbation. These symptoms began suddenly and with maximal intensity, remained constant for eight or more days, then gradually diminished, complete disappearance taking place as a rule only after fifteen to twenty days. No fever ever accompanied the mental disturbances save in the fatal case, and in this it was due to a coexisting local infection. Having noted but one instance of cerebral tetanus among over eighty cases of tetanus seen before June, 1916, the authors ascribe the recent massive incidence of such cases to the changes in treatment introduced since that time. Hitherto cases succumbed as soon as the tetanus toxin had ascended as far as the medulla. At present, however, as a result of improved methods and the free use of serum, sodium bisulphate, and regional anesthesia, the bulbospinal system is enabled to escape lethal involvement and the poison continues its ascent, with attenuated effects, to the cerebrum.

Experiments Bearing on the Flow of Lymph in Nerves.—L. B. Alford and S. I. Schwab (*Journal of Nervous and Mental Disease*, February, 1918) thus summarize their paper: 1, The hypothesis that there is a flow of lymph along nerve trunks in a central direction has been advanced and has been used in explaining the situation of the lesion in paresis, tabes, herpes zoster, and other affections of the nervous system, and in accounting for some of the facts of tetanus, rabies, and poliomyelitis. It is supported by the results of a number of experiments. 2, In attempting to repeat and amplify some of these experiments, we have injected a solution of certain iron salts, of fuchsin India ink, turpentine and ether into nerve trunks of animals, but have found no evidence of the existence of an ascending lymph stream. 3, It has been found, however, that when certain substances, particularly turpentine and ether, are injected into nerve trunks, they flow along under the sheath for long distances and may enter the subarachnoid and subdural spaces. This fact, and not the presence of an ascending lymph stream, may account for some results of other observers. 4, It has been found, finally, that ether injected into infraorbital branches in the cheek passes into and causes a degeneration of the Gasserian ganglion.

Malarial Mimicry.—A. E. Kamar (*Journal of Tropical Medicine and Hygiene*, December 15, 1917) believes few practitioners realize how closely malaria can mimic other diseases. In a tropical town a man arrested because he is extremely noisy and apparently drunk may next morning be found very ill or dying and the blood examination shows many subtertian parasites, indicating pernicious malaria. A man brought to a hospital in a stuporous or melancholic condition, with normal or subnormal temperature, may be considered a lunatic, but a blood film leads to the true diagnosis of pernicious malaria. A man never known to have malaria, attending a concert, slipped off his chair, unconscious, and was thought apoplectic; a blood examination showed malarial parasites. Pernicious malaria may produce a clinical picture by no means unlike cerebrospinal meningitis. A boy aged twelve was brought to a hospital, unconscious, with dilated pupils, very slight corneal reflex, involuntary passage of urine, twitching of the fingers and toes, rectal temperature 103° , tongue coated, and spleen enlarged. Lumbar puncture was negative but subtertian parasites were found in the blood. In another case, a male aged twenty-five, the malarial condition resulted in acute mania so violent that the patient had to be put in chains and under guard. He talked incessantly and never replied correctly to questions. Under repeated ten grain intramuscular injections of quinine bihydrochloride he recovered completely in fourteen days. The temperature in this case never rose above normal, though there was a history of recent attacks of fever. In malarial districts, in the event of sudden insanity or a violent crime committed without any sufficient reason, malarial infection should be tested for by blood examination and quinine therapy. The case simulating cerebrospinal meningitis indicates that the diagnosis of this disease without lumbar puncture may not be trustworthy.

The Nature of the Mononuclear Cells Seen in the Exudate of Lobar Pneumonia.—Jonathan Forman and C. Claron Hugger (*American Journal of the Medical Sciences*, March, 1918) find that mononuclear cells predominate in the exudate of lobar pneumonia accompanying typhoid fever. These mononuclear cells may be classified as lymphoid cells; epithelial cells which have desquamated into the air sac; large mononuclear leucocytes in abundance which contain indophenol oxydase granules; and large mononuclear leucocytes which are not so numerous and do not contain granules which react to the indophenol blue synthesis.

Therapeutic Experiments with Rosenow's Antipoliomyelitic Serum.—Harold L. Amoss and Frederick Ebersson (*Journal of Experimental Medicine*, February, 1918) performed two series of experiments, the object of which was to compare Rosenow's so called antipoliomyelitic serum with the immune serum obtained from monkeys which have convalesced or recovered from experimental poliomyelitis. An active virus of poliomyelitis was introduced into the blood of monkeys, and then the two kinds of serum were injected into the cerebrospinal meninges. The results of the experiments are exceedingly interesting, in that they show the Rosenow serum to possess absolutely no power to protect, and that it acts in the manner of normal horse serum, promoting the passage of the virus of poliomyelitis from the blood into the nervous organs. The monkeys receiving the virus intravenously and the convalescent or immune monkey serum intraspinally did not develop paralysis.

Streptococcal Infections after Measles and Other Diseases.—Ernest E. Irons and David Marine (*Journal A. M. A.*, March 9, 1918) observed a series of thirty cases of streptococcal infection developing in a military camp among men ill with measles, bronchitis, tonsillitis, diphtheria, or who were exposed to excessive fatigue or other factors tending to diminish their resistance to infection. In most cases the main symptoms were pulmonary and developed with a sudden chill and pleural pain. In a few the symptoms were abdominal. In the pulmonary cases the physical signs were often very misleading, owing to the fact, as revealed by autopsy, that the lesions included bronchopneumonic consolidation, pleural adhesions, and empyema. One of the most striking features was the frequent very rapid development of large empyematous collections. In all of these cases which came to autopsy a streptococcus, generally hemolytic, was isolated from the heart blood, spleen, and pericardial, pleural or peritoneal exudate. Similar streptococci were isolated from the throats of about seventy per cent. of apparently healthy men in the camp. It is suggested that the condition was one which arose from invasion by the streptococcus commonly present in the throats of the men, which invasion was made possible by the reduction of resistance through the presence of some other disease, or through some other factor, such as exposure or great fatigue. In order to save as many cases thus infected with these streptococci one should practice frequent exploratory chest puncture to discover the pleural infection at the earliest possible moment.

Studies of Ferments in Cancer.—B. Brahn (*Zeitschrift für Krebsforsch.*, ref. in *Correspondenzblatt für Schweizer Aerzte*, January 26, 1918) reports concerning the content of the ferments in the autolyzed livers of individuals affected or not affected by cancer. Carcinomatous disease of any of the organs pertaining to the digestive tract, the stomach, intestine, pancreas, or gall bladder, causes a diminution of the ferment content of the liver both when these tumors have caused metastases in the liver and when they have not. Autolyzed carcinomatous and sarcomatous tissue itself shows a very slight content of ferment in comparison with normal liver tissue.

The Pathogenesis of Benign Albuminuria.—C. v. Dzienbowski (*Berliner klinische Wochenschrift*, ref. in *Correspondenz-Blatt für Schweizer Aerzte*, January 19, 1918) believes that benign albuminuria depends on a vagatonía which is itself due to a reduced tonus of the sympathetic caused by aplasia and insufficiency of the chromaffin system. In vagatonía the renal vessels are constantly dilated because of the decreased tone of the sympathetic. When, in a person so affected, a greater quantity of adrenalin is secreted because of any reason whatever, the reduction of tone of the sympathetic becomes still greater, and consequently the dilatation of the renal vessels becomes so great as to give rise to renal stasis and so to an albuminuria.

Acute Yellow Atrophy in Syphilis.—Stuart McDonald (*British Medical Journal*, January 19, 1918) enters into a discussion of the occurrence of acute yellow atrophy in association with syphilis, using as his material five recent cases studied post mortem. In each of these cases the blood from the heart and lung gave pure cultures of an organism of the coli-typhoid group. All of the patients had recently been treated with salvarsan and mercury. It is suggested that the infection, acting upon livers which had been previously injured by syphilis and possibly by arsenic plus mercury, completed the damage which permitted the onset of autolysis of the liver cells with the production of typical acute yellow atrophy.

Achylia Gastrica and Chronic Connective Tissue Lienter.—Noble Wiley Jones (*American Journal of the Medical Sciences*, March, 1918) comes to the following conclusions from a clinical study of 322 cases. Achylia gastrica is usually associated with a too rapidly emptying stomach in the broadly built, nontotic person. In the ptotic individual the factors of position and atonia seemingly tend to overbalance this tendency, and the emptying time of the stomach may be seven hours, or longer. Both the above conclusions seem to hold true in the case of chronic connective tissue lienter. In both groups dysentery is prone to occur in the nontotic type of person in whom a hypermotility of the stomach is present. Contrariwise, constipation is apt to be found in the ptotic individual in whom the mechanical factors leading to constipation exist. The symptoms and response to treatment in both groups differ noticeably according to the presence or absence of the general asthenic state. Both are distinctly amenable to treatment, and good end results can be obtained.

Vincent's Angina and the Wassermann Reaction.—Frank E. Taylor and W. H. McKinstry (*British Medical Journal*, January 19, 1918) direct attention to the confusion which has arisen in connection with the discovery of a positive Wassermann reaction in the presence of throat symptoms similar to Vincent's angina and having the fusospirochætic organisms. To test the relationship fifty-five unselected cases of proved Vincent's angina were subjected to the Wassermann test and all reacted negatively except two. Upon careful investigation of these two it was found that each of the men had had syphilis several years earlier. The conclusion was reached that the occurrence of the positive Wassermann reaction was independent of the Vincent's infection but was due, either to the coincidence of active syphilis and Vincent's infection, or to the occurrence of the latter in a latent syphilitic. In the absence of syphilis reaction was always negative.

Sterilization of Hypodermic Syringes.—H. Lyon Smith (*British Medical Journal*, January 26, 1918) has tried several methods for rapidly and safely sterilizing all glass, or glass and metal syringes and their needles without the delay and difficulty of boiling. The following mixture has proved entirely satisfactory:

Lysol,	1.0 (min. xv);
Ether,	8.0 (dr. ii);
Alcohol,	to make 30.0 (oz. i).

This solution should be drawn up into the syringe, with the needle on, two or three times to half fill the barrel; the piston should then be fully withdrawn and the syringe well shaken for a few seconds. The fluid can be used over and over until it is very turbid and tends to block the finer needles. The solution is also very satisfactory for sterilizing the skin for injections and blood cultures. It is not irritating if left on for not over ten seconds and removed by swabbing with plain alcohol.

Experimental Study of the Pathogenesis of Carcinoma.—Katsusaburo Yamagiwa and Koichi Ichikawa (*The Journal of Cancer Research*, January, 1918) produced papillomatous new growths (which they call folliculo-epithelioma) on the ear of rabbits by the repeated application of coal tar (thirty to one hundred days). By this treatment they obtained eight cases of carcinoma in its earliest stages, sixteen in an early stage, and seven complete carcinomata, in most of the cases appearing after the 150th day. After the irritant has been stopped, the hyperkeratotic pedunculated or sessile folliculo-epithelioma continue to grow and finally develop into cutaneous horns. Some of these horns grow for over a year, while others fall off spontaneously. Usually new cutaneous horns develop from the same base or from the neighboring epithelium, and in two cases an early stage carcinoma developed from them about 300 days after the tar had been stopped. Metastasis was demonstrated in the regional lymph nodes in two cases of carcinoma. This work confirms Yamagiwa's hypothesis: "The retention or continuation of chronic irritation may cause a precancerous alteration in epithelium previously normal. If the irritant continue its action, carcinoma may be the outcome, even though no specific agent has been interpolated."

Proceedings of National and Local Societies

NEW YORK ACADEMY OF MEDICINE.

Stated Meeting Held Under the Auspices of the Public Health Committee, March 17, 1918.

DR. GEORGE D. STEWART, First Vice-President, in the Chair.

Symposium on the Prevention of Disease in War Industries.—Dr. DAVID LINN EDSALL, of Boston, devoted his address to the clinical aspect of the problem of occupational diseases which he had found to be alarmingly on the increase. The first thing for the clinician to do was to divorce his mind from the traditional attitude of the medical profession; he needed to get rid of the idea that accidents alone constituted industrial hazards.

Industrial poisons alone constituted a problem. There was no way of knowing accurately how many cases there were in this country because of lack of uniform methods of statistical records or investigation. It was known, however, that two years ago thirty thousand people at one particular time were seriously exposed to these poisons in the manufacture of war explosives, and twenty-five hundred cases, confirmed by medical diagnosis, had suffered from serious poisoning. That number represented an incomplete total for it comprised only those cases actually found. Since that time the number had largely increased.

But behind manufacturies of munitions in which these conditions prevailed, there were other war activities in which poisoning occurred, such as those from lead, used for so many war purposes. More people were exposed to this poisoning than to those from substances of munition, because it was used in so many ways and by so many people, but there seemed no way of knowing just how many people were so exposed and how many poisoned. His opinion was based on experience at the Massachusetts General Hospital where in the Industrial Diseases Clinic for one year an intensive study was made of the amount of lead poisoning received there, and the results showed more than there had been any inkling of.

The manner in which that clinic was conducted was interesting. The general medical staff were so little concerned about industrial diseases that they failed to weed out these cases, so a plan was established of having a notation made on the cards of all patients admitted to the hospital of the name of the industry in which they labored, and their particular occupation. Then a trained social worker was given a list of the industries liable to yield certain clinical conditions, and stationed in the receiving room through which all patients passed. In a short time she was able to make a very accurate discrimination, and sent to the Industrial Diseases Clinic all those cases in which there was likelihood of the existence of any industrial disorder. A full time attending physician, Dr. Wade Wright, was in charge with trained assistants. In that way a fair approach was made to getting all the cases in which there was a probability of industrial conditions contributing to the disease for which the patients came to the hospital.

This was particularly valuable, especially in regard to lead conditions for there was a difference in studying the subject in that way instead of waiting for some gross indication of poisoning. The figures showed that in the five years preceding the establishment of that clinic there were 146 cases of lead poisoning received in the hospital; in the first year in which the Industrial Diseases Clinic was in operation there were 148 cases, two more than were found altogether in five years before. They were confirmed by definite clinical evidence and every well established tests. This certainly showed how much more common lead poisoning was than ordinarily supposed, for Boston was not in a special centre of lead poisoning; most of the cases were housepainters.

There were other effects of industry upon the health that might be said to be more important than poisoning itself. In ammunition works, the hazards ran very high. Careful examination of the workers would show many health disturbances, and unless some accurate, definite method of studying these questions was adopted in ordinary medical work, particularly in hospitals, one of the most important factors in the production of ill health would be overlooked. It had become increasingly urgent that medical schools and hospitals and other organized medical affairs should undertake definite and determined methods of instruction. In the short time the Industrial Diseases Clinic had been running in the Massachusetts General Hospital, it had been able to demonstrate the nature of conditions which otherwise would have received a mistaken diagnosis and incorrect treatment.

The hazards in the work itself did not end the scope of investigation. There were factors partly medical and partly social and economic, and medical men should take an interest in them all in order to reinforce influence, public opinion and indignation in regard to their influence on health. Take the question of housing: It was a pressing one in this country and had become very important in the matter of health; transportation conditions, too, were important for over fatigue more readily threatened the laborer who had to travel long distances to and from work, especially in unsanitary conveyances. The matter of food was involved; workers often came to work ill fed or not fed at all, though this did not happen so often in this country as in England where in some factories an hour or more of work was done before breakfast. The questions of resting facilities, social service facilities, hours of work, overtime, night work, and of resting periods had a large bearing on over-fatigue which, more than any other thing in relation to industry, was the most important factor in producing ill health. In recent years the question of fitting the individual physically to his job had come up. This was very important, particularly now, in the matter of getting adequate labor supply. Men with heart disease, high blood pressure and other conditions making them unsuitable for some forms of work, could be adapted to other forms, their

condition even improving with the proper labor and in a suitable environment.

Ideal conditions could not be created offhand. What was most urgently needed? The first thing was to establish minimum health regulations and proper supervision to see that these regulations were carried out. There should be Federal regulations and Federal supervision because of their power. In States where these things were well done, the Federal authorities should be advisory; in the States where they were not well done, Federal authority should be supervisory. The regulations should include protection from dangerous hazards. The next thing was to establish some organized body that would have the responsibility of carrying out definite research in methods of prevention of these hazards, but more particularly of watching for and making early demonstration and protecting people from new dangers which the inventions of this war were making more and more numerous. The information about them should be constantly increased. Then there should be provided a means of carrying on the work of the Committee on Industrial Fatigue, of studying those factors tending to produce fatigue and general disturbances of health. Physicians should also concern themselves in making public through the medical journals the various phases of industrial diseases. This responsibility could in a measure be met by properly training medical students. If regulation and supervision of regulations providing for the health of factory workers were established, there would be many occasions for the members of the medical profession to be of service, particularly those men who for some reason or other could not go into military service. Methods of supervision needed to be studied, for there were not very many men trained to examine large bodies of workers, and peculiarly adapted to place them suitably in regard to their work. It might be desirable to establish a school for intensive, rapid, and thorough training of special men as there had been for the training of military medical men in orthopedic reconstruction, head surgery, neurology, and psychiatry, and the variety of things urgently needed by the army. There could be no question that civilian medical men were as anxious to do their part for their country in its present crisis and here was the opportunity for many of them.

New Poisons in War Industries.—Dr. W. GILMAN THOMPSON, New York City, illustrated with lantern slides the hazards to which workers in war activities are exposed. He shared the opinion of the previous speaker that these were matters, particularly poisoning in the munition industry, of great interest from a medical as well as an economic point of view. These poisons incapacitated many workers and the results had sometimes been fatal. The cases were of interest to medical men also because they showed a new group of symptoms and of lesions, many of them being immediate in the intensity of their effect and in the seriousness of their results. For some time after the outbreak of the war, the manufacture of munitions in England was retarded by the lack of appreciation of the nature of these poisons and the methods of preventing their deleterious effects.

In a general way industrial poisons might be classed under those which accomplished their toxic effect through inhalation and those which were absorbed through contact. In the manufacture of different kinds of high explosives, sulphuric and nitric acids were used, and if the carbonyls or retorts broke or the fumes gained access to the room in any manner a number of workmen might be overcome. Other substances used were also volatile. The second group arose from handling and dealing with nitrite compounds, and some of these constituted a serious menace to the workman. It is not always the workmen specifically employed in the handling of these materials who suffered these accidents, for, to a large extent, they had learned how to take care of themselves, but more frequently the casual laborer employed in some emergency. There had been instances of a steamfitter, for example, going into a large retort to make repairs and being overcome because he had been unprotected against so serious a hazard.

The symptoms which arose from handling specific poisons formed a definite group. Those from benzo and toluol affected primarily the nervous system, with vertigo and mental excitement followed by stupor and twitchings, varying pulse rate and convulsions. In mild cases the symptoms were not unlike those of alcoholic intoxication. Postmortem examination of victims poisoned with those substances showed vascular congestion with hemorrhages and degenerative changes in the liver. Among the compounds which went to form one of the highest explosives manufactured was trinitrotoluol, commonly called T. N. T., and this produced deleterious changes in the blood. Many of the nitrites caused degeneration of the epithelium with fatty emboli which gave rise to hemorrhages of greater or less degree. Trinitrotoluol also caused a lymphocytosis which was characteristic of this poison. This was one of the poisons which was cumulative, reaching its intensity in a month or two; meantime there were changes in the skin, the patient acquired a yellow, livid color, and as the condition progressed a variety of symptoms might be superadded such as cramps, diarrhea, and nervous disorders. In some cases there was edema of the legs. All these poisons acted both upon the central nervous system and the blood. If death occurred from trinitrotoluol poisoning, a postmortem showed a condition of the liver resembling acute yellow atrophy.

The methods of manufacturing these explosives involved a number of different processes, such as the pouring of strong acids and washing the substances to render them neutral, grinding, etc. Sometimes the substances were obtained in powder form; others came in a pasty condition. They had to be shovelled and sometimes barreled for transportation to the loading plants. This variety of processes and machines required much attention and care and a large number of men were employed to do this work.

Absorption of the nitrite poisons took place through the skin and the respiratory tract if the workmen were not adequately protected by mouth and nose coverings and close fitting gloves and overalls. If in loading, any of the trinitrotoluol ran

down the sides of the shells or spilled on the floor it might poison any one who touched it with bare hands, or it worked in through thin shoes. To avoid this the outside of the shells could be protected by a covering and the workers should wear respirators, caps, gloves and close fitting overalls. It has been found that the women were more careful than the men to protect themselves.

Lead poisoning was often acquired in the war industries because lead was used in so many ways that one would hardly think of unless familiar with the different processes. It was used in painting aeroplanes, in the manufacture of glass lamps and lenses, for storage batteries, soldering joints and seams, on food tins, and in numberless ways.

Another source of poisoning was in handling dye stuffs which were used in the preparation of war materials and in many of these plants conditions were very bad, as shown by some of the pictures which had been taken recently. Another hazard lurked in those shops where emery wheels were used for grinding and polishing; there was an enormous increase in the output of brass apparatus and implements of all kinds which had to be ground and polished, and those doing this work were subject to pneumoconiosis from the inhalation of the dust.

Legislation alone would not lower the morbidity records; intelligent supervision was an additional and important requirement as well as education of the workers in an appreciation of the dangers that menaced them without protective appliances. The attitude of many manufacturers was very gratifying, even if chiefly due to the economic advantage to them of keeping their employees in good health.

Methods of Prevention and Control.—By Dr. JOSEPH W. SCHERESCHESKY, Assistant Surgeon General, The United States Public Health Service, Washington, D. C. An abstract of this address was published in the JOURNAL March 16, 1918.

Aid from the Medical Profession.—Dr. ALFRED STENGEL, Philadelphia, confined himself to speaking of and for the attitude of the medical profession toward the very desirable work outlined by the other speakers. Under the head of war industry he included not merely munition works but a number of occupations and a number of people engaged in them such as ship building, textile factories, iron and steel works, all those industries which tended to be speeded up under governmental control in such a way that the maximum of output be secured. The munition plants, especially those manufacturing high explosives, would naturally be segregated; they would be under governmental control and probably the living conditions of the workmen also, or under that of organizations associated with the government. To safeguard men under such conditions was simpler than in other war industries located in the midst of large communities, the workmen particularly living in crowded contact with the rest of the community. In these industries the medical profession might perhaps be particularly helpful.

Certain assumptions might be made in the first place. The Government Health Service, or whatever organizations took this matter up, would see to it that the particular arrangements were made at the plants to prevent so far as possible the incidence

of disease and undue fatigue. It could be assumed that fatigue, sanitation, proper lighting, heating, ventilation and health hazards of all kinds would be provided for. In connection with that, the matter of proper nourishment was important; as concerning the industry, and it has been found a matter of economics to establish canteens, through which wonderful results had been gained in the efficiency of the workers.

Now where did the medical profession come in? It came in after these preliminary provisions had been attended to. It would be a futile arrangement to establish an expensive scheme for the protection of the workman during his eight working hours if the sixteen hours in which he did not work received no thought or care or attempt at regulation.

Before anything could be done by the medical doctors which would be helpful, it was necessary that its members educate themselves up to the needs of this important demand. All were not experts; indeed, many were tyros in this matter of industrial diseases. It was only in the last few years that any one had become keenly alive to the significance in industry of morbidity and disease. Some few had had opportunities, and a small army of industrial physicians had grown in this country, but the average conception of such a man was a narrow one. It was necessary to have a campaign of education; special medical meetings should be held, all medical societies should have discussions on the general subjects of housing, food, and proper environment, the attention of physicians should be directed to descriptions of industrial diseases now beginning to crop up so abundantly. That this was important could be instanced from the speaker's own experience. In Philadelphia he had seen a number of cases from neighboring states, regarded as suffering from obscure conditions by local physicians and the patients treated without knowledge of the real diagnosis. They obtained leave of absence for gripe or colds, without investigation at the plants where they worked or any idea that they were suffering from occupational diseases. The family physician recognized fatigue, but the proper and scientific evaluation of it was a different matter.

There should also be prepared, under the direction of the Public Health Service, leaflets or pamphlets in uniform editions so that they might be bound, containing information about these industrial diseases and physicians should be stimulated to interest themselves to secure and keep these for reference.

An effort should be made to establish more public industrial clinics, well equipped and established for clinical work and for giving courses of instruction and investigation of conditions as they were at present.

Every medical school should be encouraged to establish courses on industrial diseases and every large hospital encouraged to establish clinics for industrial diseases.

Finally, and this most important, particularly as a direct contribution, arrangements should be made by public health authorities to cooperate with the National Council of Defense to report all forms of industrial diseases; more than this, health cards should be kept by the family physicians which would record not only the definitely ascertained diseases,

but every medical and surgical condition for which the workman consulted him. This might seem a trespass on personal liberty and an additional lot of clinical work for the doctors, but neither workmen nor physicians were lacking in these times, in the loyalty that would be shown in helping to secure the results being striven for.

First aid work in the plants themselves was important. Physicians in charge of cantonments had discovered that with the receipt of each number of new recruits, a number of new cases of illness were brought out. The men in the cantonments were not crowded together. The same thing happened in factories, and a great deal of the ill health there was not so much from fatigue as the result of minor infections. Where men were massed together, unless close inspection was made of those with minor ailments there would be deterioration of all the workmen. Under the circumstances this was a hazard to all. A part only of this would be the care of the family physician, but also it would be the care of the state aid department in connection with war industries.

These were merely suggestions that occurred in regard to the part the medical profession had to play, apart from the organizations. It would seem desirable that those physicians too old or for other reasons reasonably certain of being unfit for military duty, should prepare to serve their country by making themselves proficient in all matters pertaining to industrial diseases, particularly those of war industries, for the health of the nation was its greatest asset and those units of the nation, the laborers, were and would be still more so after the war, of the greatest value in the welfare of the country.

Letters to the Editors.

EFFECTS OF ARSPHENAMINE AND NEOARS-PHENAMINE.

WASHINGTON, D. C., April 5, 1918.

To the Editors:

In view of the reports in current medical literature of untoward results from the use of arsenphenamine and neoarsphenamine, I have to ask that you give publicity to the statement that it is requested that samples of any lots of these arsenicals which have shown undue toxicity be forwarded to the Hygienic Laboratory for examination.

In sending these samples it should be ascertained that the lot number is the same as that of the ampoules used on patients. The samples sent should, if possible, be accompanied by a brief note stating the approximate body weight and age of the patient, the dose and dilution of the drug given, the symptoms and result; that is, whether fatal or not.

Respectfully,

G. W. McCoy,

Director Hygienic Laboratory, United States Public Health Service.

DISINFECTION AT THE BASE HOSPITALS.

RICHFIELD SPRINGS, N. Y., April 4, 1918.

To the Editors:

Notwithstanding the numerous excellent articles by well known men, on the care and management of pneumonia as a sequela of la grippe and the frank manifestation of the disease, they fail to lay stress on the necessity of preventing extension of the disease in army encampments by rigid measures of disinfection of clothing, utensils, bedding, etc.,

used by the sufferer. It must be borne in mind that during epidemic periods of either pneumonia or la grippe, it is the physician's duty in every instance to give instructions concerning the character of both diseases; the absolute necessity of thorough fumigation of the apartment occupied, and complete disinfection of every article which has been in contact with the patient. It is the close observance of these rules which will positively diminish the gravity of the disease and abort the extension of epidemic duration.

ALFRED R. CRAM, M.D.

Book Reviews.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

Tratado de Cirugia Clinica. Por P. TILLAX, Catedratico de clinica quirurgica de la facultad de medicina de Paris, Miembro de la Academia de Medicina de Paris, Cirujano del Hospital de la Caridad. Tercera edicion española. Traducida, Revisada, y Anotada, de la Quinta Edicion Francesa. Por el Dr. Leon Cardenal, Catedratico de patologia y clinical quirurgica de la facultad de medicina de Madrid. Tomo II con 88 Figuras en el Texto. Barcelona: Salvat y C., S. en C., 1917. Pp. 335.

This is the translation into Spanish of the second volume of the work published originally in French by P. Tillaux, of Paris. It is printed on the usual poor grade paper of European publications which the purchaser is expected to have bound to suit his own fancy and to conform to the binding of the rest of his library. The illustrations are few and rather crude, and diagrammatic, photographs being entirely absent. This volume treats of the surgery of the abdomen and the pelvis, including the bladder, the prostate and urethra. While it is hardly fair to judge of a system of surgery by the perusal of one volume, it may be safely said that the American student of surgery has much to be thankful for that he has not to rely for his surgical information on the dull, dry, unattractive pages of the average European text book, of which this is a fair sample.

The Treatment of Infantile Paralysis. By ROBERT W. LOVETT, M.D., Boston, John B. and Buckminster Brown Professor of Orthopedic Surgery, Harvard Medical School. Second Edition, Revised and Enlarged. With 123 Illustrations. Philadelphia: P. Blakiston's Son & Co., 1917. Pp. xi-175. (Price \$1.75.)

Experiences in the last year or two have demonstrated beyond doubt the great importance of anterior poliomyelitis, and much literature has naturally made its appearance dealing with phases of this disease. At the beginning of the recent epidemic the first edition of Lovett's book was already on the market, but he himself could hardly have anticipated the course of events. The occurrence of something like 27,000 cases in about one year's time of a disease which had been considered rather infrequent than otherwise has naturally changed our attitude toward that disease, as well as increased our understanding of it. Lovett is here presenting a revised and enlarged edition containing, so far as it has crystallized out, the knowledge we have gained from the epidemic. He makes especial use—and rightly so—of the 2,500 cases studied in so much detail by the New York Health Department.

True to its title, this book deals with the treatment, although the first chapter is given over to a discussion of the pathology, symptomatology, diagnosis, and prognosis as they bear on the treatment. We especially commend Lovett's attitude toward prognosis, indicated in this statement: "There seems to be no time limit to the benefit to be derived from treatment." There has been far too much "expectant" treatment—too much naive admiration of the mirage of "spontaneous improvement." Lovett's treatment is, in a word, muscle training, and he is in the relation to infantile paralysis that Frenkel is to locomotor ataxia. He does not neglect, however, other forms of treatment, for in this book will be found discussion of all the conven-

tional methods of treatment in each phase—the so called acute, convalescent, and chronic. The operative treatment is thoroughly and intelligently discussed, as we would expect from such a consummate anatomist. It is, however, when we come to the subject of muscle training that we find the best part. The author describes no less than 162 exercises together with sixty-eight examination methods, which are illustrated with informative diagrams. The spring balance muscle test, devised by the author and E. G. Martin, is fully described in the last chapter. Altogether this little volume is well conceived and admirably executed. Its physical makeup is good, paper, binding, print, and illustrations, no common matter nowadays, as any publisher will attest.

Manual of Splints and Appliances for the Medical Department of the United States Army. Report of a Board convened for the purpose of standardizing certain Medical Department supplies. Lieutenant Colonel WILLIAM L. KELLER, M. C.; Major ROBERT B. OSGOOD, M. R. C.; Major ALEXANDER LAMBERT, M. R. C.; Major JOSEPH A. BLAKE, M. R. C.; Captain W. S. BAER, M. R. C., and Captain NATHANIEL ALLISON, M. R. C. New York: Oxford University Press, 1917. Pp. x-208. (Price \$0.75.)

One of the valuable by-products of the war is the series of concise manuals for the guidance of military surgeons which have begun to make their appearance. One of the latest of these deals with splints and appliances for the Medical Department of the United States Army and consists of the report of a board convened for the purpose of standardizing certain Medical Department supplies. Under special orders from the headquarters of the American Expeditionary Force in France. The board is composed of Lieutenant Colonel William L. Keller, M. R. C.; Major Robert B. Osgood, M. R. C.; Major Alexander Lambert, M. R. C.; Major Joseph A. Blake, M. R. C.; Captain W. S. Baer, M. R. C., and Captain Nathaniel Allison, M. R. C. While the Medical Department does not desire to dictate the exact line of treatment to be followed in base hospitals, it is necessary to have certain standardized simple forms of splints and appliances designated so that surgeons will be able to have their wants filled with the least possible trouble and delay. This little manual which is issued by authority of the board will be a great aid in this direction and will prove invaluable as a guide to hospital authorities as well as surgeons.

La Prothèse du membre inférieur. Par Le Dr. F. MARTIN. Avec 45 figures dans le texte. Paris: Masson et Cie., 1918. Pp. viii-107.

The "Ambulance de l'océan" at La Panne has become justly famous for its remarkable surgical work during the present war, and this little book gives a good idea of the originality, the patience, and the attention to detail possessed by the French army surgeons.

The striking point of the work described in this monograph is the early transformation of leg amputation cases from bed cases to ambulant cases. This occurs on the ninth day in cases of amputation below the knee and on the twenty-first day where the amputation is above the knee, and is accomplished by the making and adapting of a provisional artificial limb which enables the patient to go about without crutches. This temporary leg is made by molding a plaster of Paris cap to the stump and incorporating in it wooden bars which give it very much the appearance of a crutch at the bottom. This is made to correspond to the length and axis of the missing leg and renders possible walking without crutches, and usually without even a cane, thus obviating the atrophy of the muscles of both the stump and the trunk which occurs when the patient is kept too long in bed and when he then goes about still longer on crutches.

The permanent artificial leg is carefully constructed from drawings by an artist, that it may correspond in every way to the good remaining natural leg, and it is interesting to note that the Belgian and not the American product is preferred, as the latter has not, and cannot be given any individuality. Motion pictures are taken of the patient from in front and from the side to see if there be any noticeable difference in the gait on the affected side, and if there be any it is corrected. The many excellent photographs show the steps of the method, and they certainly show no atrophy of muscles in cases

thus treated, and, further, the short stay in bed with freedom from the hated crutches seem to practically remove all the mental depression usually seen in bedridden leg cases.

A Text-Book of the Practice of Medicine. By JAMES M. ANDERS, M. D., Ph. D., LL. D., Professor of Medicine, Medico-Chirurgical College Graduate School, University of Pennsylvania; Consulting Physician to the Jewish Hospital; Officier de l'Instruction Publique, etc. Thirtieth Edition. With the Assistance of John H. Musser, Jr., B. S., M. D., University of Pennsylvania. Illustrated. Philadelphia and London: W. B. Saunders Company, 1917. Pp. 1259. (Price, \$6.00.)

In a notice of a book which has taken and held its place among the standard text books, and which is now in its thirteenth edition, it is perhaps necessary merely to indicate its advances over the preceding edition. Anders's *Text-Book of the Practice of Medicine* is well established in medical bibliography and the profession has long since been accustomed to look to it as a high authority and court of appeal. This last edition shows evidence of a conscientious effort to incorporate the permanent scientific advance of the last two years, evidence borne out by the statement of revisions, reprintings, and recopyrights of twelve editions in eighteen years. Much matter has been added—e. g., on Treatment of Tetanus, Acidosis (in Diabetes), Chylothorax, on Etiology of Aortic Incompetency, Treatment of Asthma, Diverticulitis, Functional Tests of Hepatic Insufficiency, Gaucher's Disease, Estimation of Renal Function, Anaphylaxis of Food Intoxication, the Pneumococcal Infections, Focal Sepsis, Rat-bite Fever, Febris Wolhynica, and Pyorrhea Alveolaris. The following subjects have been rewritten: Prophylactic Vaccination, Specific Therapy in Typhoid Fever, Specific Therapy in Tuberculosis, Pellagra (Nutritional Disorder), Splenic Anemia, the Arrhythmias, Intestinal Toxemia, Bacteriology of Whooping Cough, Hemolytic Jaundice, and the section on Diseases of the Nervous System. The classification of diseases is remodeled to suit new needs. This text book gives, on the whole, thoroughly dependable, well-balanced, and progressive descriptions of physical cause and effects and treatment.

Ammunition for Final Drive on Boose. An Up-To-Date Arsenal for Prohibition Speakers. By Rev. LOUIS ALBERT BANKS, D. D. New York and London: Funk & Wagnalls Company, 1917. Pp. xv-402. (Price \$1.50.)

This volume is a contribution to the "Ten Nights in a Bar-Room" school of literature. In it are herded together all the arguments, epithets, and vilification by a thousand prohibition orators. The book contains no study of alcohol, therapeutically or psychologically, nor any attempt to solve the alcohol problem, nor even a distant approach to the problem which lies back of it—human inadequacy, with its defence reaction. The book contains much turgid rhetoric, a little eloquence, and a trace of logic.

Births, Marriages, and Deaths.

Died.

HOPPER.—In Jersey City, N. J., on Monday, April 8th, Dr. Thomas Banta Hopper.

JOLIFFE.—In Hackensack, N. J., on Sunday, April 7th, Dr. Charles C. Joliffe, of Hasbrouck Heights, N. J., aged sixty-nine years.

MCCURDY.—In Delta, Pa., on Thursday, March 21st, Dr. William Henry McCurdy, aged sixty-four years.

RENO.—At sea, on Thursday, March 21st, Lieutenant Colonel William W. Reno, Medical Corps, United States Army, aged forty-six years.

VON RUCK.—In New York, N. Y., on Sunday, April 7th, Dr. Silvio Von Ruck, of Asheville, N. C., aged forty-two years.

WALTHER.—In New York, N. Y., on Wednesday, March 27th, Dr. John August Walther.

WATSON.—In Concord, N. H., on Wednesday, April 3d, Dr. Irving Allison Watson, aged sixty-nine years.

WHITE.—In Hackensack, N. J., on Tuesday, April 2d, Dr. Frank H. White, aged fifty-five years.

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Original Communications

MALPOSITIONS AND THEIR TREATMENT.*

By J. W. MARKOE, M. D.,

New York,

Attending Surgeon, Lying-in Hospital.

The obstetric service of the Lying-in Hospital has been statistically recorded from 1890 to the present date, a period of twenty-eight years, and the number of confinements on which these records are based has passed the hundred thousand mark. The compiling of such a great number of cases into an article that will be accurate and comprehensible is a most difficult task, but it is hoped that in the near future this can be accomplished. In the mean time I must refer to my article published in 1909, *Observations and Statistics in Sixty Thousand Labors Occurring in the Service of the Society of the Lying-in Hospital*, from which the following is taken.

Displacement of Fetal Parts.

	Per cent.
Upper extremity, prolapsed.....	309 0.50
Lower extremity, prolapsed.....	92 0.15
Funis, prolapsed.....	569 0.93

Presentation in Cases of Displacement of Fetal Parts.

In cases of prolapse of the upper extremity, the presentations were as follows:

	Per cent.
Vertex presentation.....	110 30.00
Breech presentation.....	38 12.30
Shoulder presentation.....	142 45.95
Face presentation.....	2 0.65
Brow presentation.....	3 0.97
Not observed.....	14 4.53
Total.....	309
Twins.....	39 0.10

In cases of prolapse of the lower extremity, the presentations were as follows:

	Per cent.
Vertex presentation.....	17 18.48
Breech presentation.....	53 20.61
Shoulder presentation.....	19 20.65
Face presentation.....	3 3.20
Total.....	92
Twins.....	5 5.43

In the cases of prolapse of the funis, the presentations were as follows:

	Per cent.
Vertex presentation.....	17 18.48
Breech presentation.....	53 20.61
Shoulder presentation.....	19 20.65
Face presentation.....	3 3.20
Total.....	92
Twins.....	5 5.43

*Read at the meeting of the Eastern Medical Society, February 8, 1918.

	Per cent.
Vertex presentation.....	310 14.8
Breech presentation.....	115 29.21
Shoulder presentation.....	97 17.05
Face presentation.....	10 1.76
Brow presentation.....	6 1.05
Not observed.....	14
Total.....	569
Twins.....	42 7.38

Many malpositions are unrecognized as they not infrequently become normal in the course of labor where the passages and the child are so proportioned that there is no interference with flexion or extension by the natural forces.

There are two main causes of malpositions: variations and deformities in the natural parturient canal, and abnormalities connected with the child.

Variations and deformities interest the obstetrician only where the variation or deformity is of a very limited degree, for in the marked type of a contracted pelvis delivery of a living child through the vagina is impossible and resort must be made to some other mode of procedure. Abnormalities in the child are extremely difficult to diagnose before the onset of labor, notwithstanding all the ingenious methods that have been devised for measuring a fetus in the uterus.

In normal presentations, that is, the two anterior positions of the occiput, there is rarely malposition unless one considers the pendulous abdomen where the presenting part is forced rather toward the promontory than into the brim. This can usually be directed into the proper channel by posture and abdominal support. The most difficult case is that in which an old ventral suspension pulls the anterior wall of the uterus directly downward toward the symphysis, and surgical interference is not infrequently called for.

Occipitoposterior positions should be considered abnormal, as, in a given number, the occiput fails to rotate to the front; yet we all know that many occipitoposterior presentations do rotate and are born without untoward symptoms. When in occipitoposterior positions the head does not rotate, it is usually due to a failing of the head to properly flex so that it may pass forward under the spines of the ischia. This may be due to a relaxed perineal floor or to a combination of it with ischial spines that project abnormally within the pelvis.

In all such cases when seen early, every effort

should be made to complete flexion and produce downward pressure by posture. This, in the majority of cases where the proportions between mother and child are relatively normal, will end the case by converting it into an anterior occiput presentation. In cases where for some reason this fails to take place, there is a possibility of the birth being completed without injury to mother or child if the forces are adequate and the maternal tissues so distensible as to allow the passages of the persistent occipitoposterior. In some the rotation may be accomplished by using one blade of the forceps as a vectis and then assisting the head to rotate, but the use of the forceps, applied as they must be in such a case, is to my mind a dangerous procedure.

In the more severe cases, especially in a small primipara with a large child, operative measures will have to be adopted according to exigencies. Brow and face cases may be taken together as the treatment is virtually the same, and the same rules apply to these cases as in the occipitoposterior positions. Some will come through without aid and in other cases interference will be necessary. Whenever a case presents in this way at the brim, and efforts to convert it into an occipital presentation fail, it is wiser, where possible, to perform a podalic version before the presenting part becomes impacted. Rarely will it be necessary to do more if the mother's pelvis be normal. Where there is certain dystocia due to the pelvis, abdominal section may be indicated, but such a condition has never presented itself to the writer.

Breech presentations should also be classed as malpositions and one of the most difficult classes to deal with, as one never accurately knows what the relation of the aftercoming head bears to the mother's pelvis. If the bones of the skull are soft and the fontanelles large, allowing of easy over-riding, there is likely to be but little difficulty, but, if we have a firmly made bony head with very little resiliency, there is apt to be difficulty in its extraction, with consequent danger to the child.

McPherson in his article, *Is the Operation of Cesarean Section Indicated in the Delivery of Breech Presentation?* shows that the fetal mortality is generally estimated as from ten to thirty per cent. In 3,412 breech cases, curiously enough, there was but slight difference in the fetal mortality in primipara and multipara. The maternal mortality was not very greatly different from that of normal cases—0.47 per cent.—but nothing is said of the morbidity in the shape of deep lacerations of the cervix and perineum, which one who has done much obstetric work knows to occur more frequently than generally believed.

Therefore, before undertaking a case known to be a breech every preparation should be made to meet emergencies which may arise, such as instruments for craniotomy on the aftercoming head. A breech case should not be undertaken without adequate skilled assistance, as the management of the head from above must be, next to the extraction, the most important step.

One of the cardinal rules in these cases is to prevent if possible the rupture of the membranes. The full breech is a better dilator than the half breech,

so it is never wise to pull down a foot until the operator is ready to deliver, or where the membranes have already ruptured and it becomes necessary to begin traction in order to complete the dilatation of the maternal parts. Great care must be taken not to injure the cord during the extraction and to release slowly the extended legs or arms so as not to cause a dislocation of the epiphysis or a fracture of a fragile bone. Shoulder presentations usually indicate a deformity, either in the uterus itself or a pelvic deformity which prevents the normal presentation to continue. These cases are comparatively easy of delivery, provided they are seen early and the membranes have not been ruptured. In rare instances they may be converted into a vertex or breech presentation and the case continue to a normal ending, but this is extremely rare, for the conditions that originally caused the shoulders to present usually cause a rapid recurrence of the original presentation.

In these cases posture is of more assistance than that of any other method up to the time that the membranes rupture; then there is nothing left to do but perform a podalic version, taking it for granted that the mother's pelvis is sufficiently normal to allow the passage of the aftercoming head. In long neglected cases there is, of course, great danger of rupturing the uterus especially in old multiparae where the cervix has been previously ruptured and is friable.

Prolapse of the cord, in rare cases, can be replaced in the knee-chest position and the child then delivered by the best adapted means. Here again a resort to podalic version may secure a living child, especially in cases where the pelvic canal is large and the perineum not a barrier.

Instruments have been devised for replacing the cord, but no better one exists than the ordinary sterile catheter with a stilette to carry the loop of the tape which is passed through the catheter and brought out of the eye, thus being then looped over the cord and the tape passed over the head of the catheter; the cord is thus held firmly and will easily carry the cord well up into the uterus. On withdrawing the catheter the tape will slip off the head of the catheter and the cord be released. If this does not occur, it is wiser to withdraw the stilette and allow the catheter to remain in the uterus. It can do no harm.

These are the main malpositions which are met, and yet, in an experience of thirty years, I can truly say that no two cases present exactly the same features. What is needed is a most careful study of each case that comes to us and a realization that obstetrics is, first and foremost, a truly surgical procedure, and if an obstetrician be surgically clean in all his technic his results for mother and child will be greatly improved. Remember that sepsis is the leading cause of death to the former in all confinements recorded. This is graphically demonstrated from time to time to those of us with large hospital services where cases are sent in with rupture of the uterus. It is my regular practice in all such cases to take a culture with the greatest care from the vagina and one from the uterus before even a finger is introduced into the canal. The results are

according to the infection. A hysterectomy is performed and if the culture is sterile, the patient usually recovers promptly, but in cases where the cultures are positive, death is the rule.

12 WEST FIFTY-FIFTH STREET.

MEDICAL SUPERVISION OF TRINITROTOLUOL WORKERS.

By W. G. HUDSON, M. D.,

New York, and Wilmington, Del.,

Medical Director, E. I. du Pont de Nemours and Company, Chairman, Subcommittee on Industrial Diseases and Accidents.

TNT poisoning has attracted a great deal of attention during the past few years partly because of its alleged novelty, partly because of its association with the various war industries, and as a most serious industrial disease. As a result of its study by distinguished members of our own profession working in conjunction with equally proficient safety engineers and operating experts, the prophylactic side of the question has been pretty well worked out. And I might be permitted to go on record here as saying once for all that the side of prevention is by all means the most important, lest anything I may say later may be misconstrued.

TNT manufacture is not by any means so novel as imagined, for the Du Pont Company have been making it for about ten years under its former trade name "Triton," and its poisonous qualities have been early recognized and studied. Also, when abroad, I visited a well equipped factory for its manufacture in Scotland in 1912, which had been running for several years, and where the possibilities of poisoning were fully recognized and guarded against. But while a number of poisoning cases have occurred in the manufacture of TNT, the number has been negligible when compared with those who began to drop on all sides as soon as the thousands of workers in all countries commenced the wholesale loading of high explosive shells. The reason is plain: it does not take many employees to operate a TNT factory having a tremendous output, and preventive measures and medical supervision have always been maintained in such factories. On the other hand, many times the number of employees are required to load the output of a factory into shells. The early loading factories were generally put up in a hurry without much knowledge of the poisonous nature of the substance to be handled, and the work itself actually involves far greater exposure to poisoning by the compound than does its manufacture.

Therefore when the Du Pont Company put up its first shell loading plant—a comparatively recent venture—it not only had experience to guide it, but a warning conveyed by the numerous and often fatal cases recorded since 1914. What it is possible to do in the way of precautions is well embodied in a paper by Dr. J. W. Schereschewsky, of the United States Public Health Service, *Practical Points in the Safe Handling of Trinitrotoluol* (*Monthly Review of the United States Bureau of Labor Statistics* for December, 1917) which I believe is based largely upon a visit to this plant. If still more detailed information is desired, there is the set of manu-

facturing standards adopted by the Subcommittee on Industrial Diseases and Poisons of the Advisory Board, Council of National Defense. These go as well into all the sanitary requirements of a plant, and are quite workable because they were only formulated after several conferences with all the manufacturing experts who could be induced to attend, and, as finally adopted, everything shown to be a real obstacle to efficient manufacturing and loading ironed out. These standards will probably be published in time in the *Monthly Review of the United States Bureau of Labor Statistics*.

These works cover the field of prevention so well that I will now turn to the more immediate object of this paper, which is an effort to answer in greater detail the numerous letters continually received from various physicians inquiring what it is best to do in managing cases of TNT poisoning.

The physician who is employed on a full time basis by the munitions maker and established at the plant is the one who can make his efforts count the most. He should read Doctor Schereschewsky's article and compare it with what is going on around him, in order to make sure that all that is possible is being done. But, even with all this, there will be some cases of poisoning, and the next best thing to prevention is to catch them in their incipency. To do this, one must be familiarized with the symptoms. Let me outline the usual symptoms.

If there is an appreciable quantity of TNT vapor or dust present, a bitter taste is soon noticed. Even if the mouth is kept closed, what is inhaled through the nose will be tasted. TNT is an irritant, so that what is swallowed leads first to gastrointestinal indigestion, later to vomiting. Some cases are obstinately constipated, a few develop diarrhea. The irritant effects are also manifest on the skin of some persons, varying from the mere building up of an excessively thick cuticle to an eruption resembling papular eczema.

In the course of a few days a severe general malaise appears, with headache, pain in the chest, vertigo, and weakness in the limbs. If the exposure is allowed to continue, it will not be many days before cyanosis is noticed about the lips, with a sickly yellowish pallor of the rest of the skin. Still later, a true jaundice appears, and we are then rapidly approaching a condition where treatment will not avail and the man will die of toxic jaundice. We have so far been fortunate in catching our cases long before they have reached this stage; but from the experience of others it would seem that there are fulminant cases which develop rapidly into a malignant toxic jaundice with but little previous warning.

There are three other points in which our experience has differed a little from others. First, quite a number have shown as much as three or four degrees of fever. Second, we have noted changes in the blood (relative lymphocytosis, changes in size, shape, and staining of red cells) with sufficient frequency as to aid often in diagnosing doubtful cases. Third, in old chronic or repeated mild cases we have seen a number of them develop a severe gangrene in the lower extremities.

Besides the blood examinations we have obtained useful information from the urinary examination known as Webster's Test, which is:

Measure out 125 c.cm. of the urine in a measuring cylinder, then add 125 c.cm. of diluted sulphuric acid, made up by mixing 20 c.cm. of strong sulphuric acid with 80 c.cm. of water. Pour the mixture of urine and acid into a separating funnel of 100 to 150 c.cm. capacity and provided with a stopcock; add to the mixture 10 c.cm. of ether, shake up well and allow to settle; take out the cork or stopper from the top of the separating funnel, open the stopcock at the bottom and allow the mixture of acid and urine to run off, then turn the stopcock off so as to retain the ethereal solution in the separating funnel. Now add 25 c.cm. of tap water to the ethereal solution in the separating funnel and shake up again to remove the traces of the mixture of urine and acid and allow to settle again for two or three minutes, then run off the water by opening the stopcock, retaining the ether in the funnel. Finally let the ethereal solution flow into an ordinary test tube and try for the presence of TNT as follows:

Prepare a solution of alcoholic potash by dissolving four to five grams of caustic potash in 100 c.cm. of methylated spirit or absolute alcohol. Where many tests are to be carried out this solution may be made by having a stock saturated solution of caustic potash, and adding, when a fresh quantity of the reagent is required, 10 c.cm. of this to 90 c.cm. of alcohol.

To the ethereal solution obtained as above described 5 c.cm. of this alcoholic solution of potash are added. When TNT is present a purple coloration is at once developed, varying in intensity according to the amount of TNT present, from the faintest trace to a deep purple. The color changes rapidly from the purple to a brown color, and it has been found that the best results as to intensity are obtained by judging quickly after the color is struck.

But by far the most important means of detecting the incipient cases is for the resident physician himself to make trips of inspection through the plant every day, and closely observe the employees at their work. There is a peculiar facial expression and manner of carrying one's self when poisoned with this material that can be quickly recognized by any observant man after a little experience, and our own physicians pick them out without the least hesitation and have the foreman send them over to the dispensary for further investigation and treatment.

What can we do in the way of treatment? The first thing is to make sure that all further absorption is absolutely prevented. To this end we not only remove the man from the kind of work he has been doing, but we see that he immediately takes a warm bath, during which every part of the body is scrubbed with a mixture of softsoap and sand, and that he puts on an entire suit of clean clothing. Then we begin the medical treatment, where unfortunately we have to deal with a poison for which there is no known antidote.

However, remembering that most of these early cases do well even if left to themselves once the absorption of the poison is stopped, it is plain that the chief indication is to assist elimination in every possible way, and to meet any other indications that may arise on general medical principles. Our plant physicians generally start with a rather brisk catharsis, preceding this, if there is nausea, with effervescing sodium phosphate until the nausea is relieved. Then the kidneys are stimulated by copious draughts of milk, preferably warm. I learned of the good effects of warm milk quite early in our manufacture of this explosive, and the information is published in *The Occupational Diseases*, by Prof. W. Gilman Thompson, page 336. Of course it is the water in the milk which does most of the work,

but these patients seem willing to drink a great deal more milk than they will take of water, and the water contained in milk seems to be taken up with greater avidity for some reason. When convalescence is established, tonic doses of nux vomica, syrup of the iodide of iron, and arsenic are of material benefit.

About the only condition requiring different handling from that indicated on general medical principles is the accompanying weakness. Here we should under no circumstances be tempted into giving alcoholic stimulants of any kind. Even aromatic spirits of ammonia had better be replaced by a solution of ammonium carbonate of the same strength. Not only is alcohol a good solvent of TNT, which might thereby increase the absorption, but it actually seems to be a synergist.

Besides taking these men out of the work on the first signs of poisoning, the physician can do a great deal to keep down the number of cases if he will make physical examinations of those taken on for this work. The ones to particularly exclude are alcoholics, mouth breathers, and persons showing the slightest indication of liver or kidney disease. Those who have recently had malarial fever are also open to suspicion. Of course the physical examination will also cover the other customary points, but these have a direct bearing on work in TNT. The men selected should be thoroughly instructed in the risks and in the prophylactic measures.

The great factor in keeping these men up in spite of the small amounts of poison they may absorb after we have done our best is the recuperation period, i. e., when the man is off work. If the work period is but eight hours out of twenty-four, his recuperative powers can do a great deal in these sixteen hour periods if they are spent in clean and wholesome living. But even a slight increase in the length of the working shift may greatly increase the incidence of poisoning, because it not only increases the exposure but shortens the recuperative period. This also goes to show how important it is that these men leave for home scrubbed clean of the poison and in uncontaminated clothing; otherwise the recuperative period is a misnomer, and the man simply spends his sixteen hours off duty in absorbing the poison in perhaps a slightly different way.

I do not share the optimism of those who believe most of our troubles from TNT poisoning will be solved by the adoption of the newer shell fillers in which seventy-five to eighty per cent. of the TNT is replaced by ammonium nitrate. A British physician with large experience recently told me that the danger is equally great. Nor do I share the pessimism of those who predict enormous numbers of fatalities from this source in the coming year. We would have to make and load TNT even though many of us should lose our lives at it, for this is war. But with the amount of study given to the prophylactic side, the prompt recognition and treatment of early cases, and the fact that no more manufacturing or loading concerns are likely to embark upon the work of handling this material in total ignorance of its poisonous properties, I look for a greatly lessened incidence of TNT poisoning for the rest of the war.

126 EAST THIRTY-FOURTH STREET.

BRETONNEAU, TROUSSEAU, AND
DIEULAFOY.*Three Famous French Physicians.*BY I. L. NASCHER, M. D.,
New York,AND MALFORD THEWLIS, M. D.,
Wakefield, R. I.,

Lieutenant, M. R. C. U. S. Army.

In a public square in the city of Tours, there stands a monument, erected to the memory of three great physicians, Bretonneau, Trousseau, and Velpéau. Today these names are well nigh forgotten or unknown, yet each of these men was in his time and in his way the master mind in his chosen field of medicine. To these we will add one more name, that of Dieulafoy, the pupil and later the successor of Trousseau at the Hôtel Dieu in Paris. With Dieulafoy's death in 1911 the famous line of French clinical observers came to an end, which began with Bretonneau a century before.

BRETONNEAU.

Modern medicine has forgotten Pierre Bretonneau though medicine owes to him the name and the first accurate account of one of the most dreaded diseases of former times, diphtheria. Diphtheria was not a new disease for it was apparently known to the earliest physicians and in the second century Aretæus described a disease which he called *malum egyptiacum* and which presented the characteristic features of diphtheria. It is probable that many of the epidemics of angina which prevailed in the sixteenth, seventeenth, and eighteenth centuries and which were described under various names by English, French, Spanish, Italian, and Dutch observers, were really epidemics of diphtheria. To Bretonneau belongs the credit of first describing it as a pathological entity having distinct clinical features by which it could be distinguished from other forms of angina, and giving to it the name by which it has since been known.

On June 26, 1821, Bretonneau presented to the French Academy of Medicine his first essay on the disease, which he called "*la diphtherite*," and during the next five months he read two more papers on the same subject. In March, 1826, Bretonneau read his fourth paper on *la diphtherite* before the French Academy and followed this with the celebrated monograph *Des Inflammations spéciales du tissu muqueux, et en particulier de la diphtherite*. The hypotheses advanced in the work form the basis of innumerable medical papers and scientific discussions for nearly sixty years. These hypotheses dealt solely with the clinical side of the disease, that diphtheria was a distinct pathological entity, that several pathological conditions formerly considered distinct and unrelated diseases were really different aspects of diphtheria, that croup was a descending diphtheria invading the larynx, that gangrenous angina and diphtheria were totally different diseases. The physician of today knows the nature of diphtheria. The science of bacteriology has exposed the fallacy of the innumerable theories which attempted to explain the nature of contagion and the definite course of infectious diseases.

In 1821 at the Académie Royale de Médecine, Pierre Bretonneau read his article on Croup and Malignant Angina. To the latter he gave the term diphtheritic phlegmasia. Bretonneau's memoirs gave consideration to sporadic tracheal diphtheria and contagion of diphtheria. The epidemic of La Ferrière and others gave him an opportunity to study this disease. It was Bretonneau who gave to diphtheria somewhat the characteristics of a substantive affection. He used the term *diphtherite* also for a condition of the skin which was similar to the throat affection. Before Bretonneau some physicians, Starr in particular, had remarked that, in certain cases of malignant angina, the skin was covered with white, putrid, false membranes, terminating in the production of gangrene; these authors had seen the analogy which existed between certain inflammatory diseases of the pharynx, esophagus, the external auditory canal, the nasal fossæ, etc.

ARMAND TROUSSEAU.

For some time Trousseau was the representative of the people in the national assembly. Trousseau was a pupil of Bretonneau and by being acquainted with the methods of this learned physician, obtained a knowledge which in years to come made him one of the world's greatest physicians, especially in the therapeutic field. Trousseau's observations on diphtheria were continued in 1835 and he gave much attention to cutaneous diphtheria. He realized the infectious nature of this disease, in fact the modern theories of infection differ very little from Trousseau's. Although he knew nothing of bacteriology yet in a clinical way he had made many conclusions regarding infection which are fully as logical as many of our modern theories.

It is interesting to note that in 1818 and 1824, Bretonneau ventured to perform tracheotomy for membranous croup, but both patients died. In 1825, he repeated the experiment with success. Trousseau performed the operation thirty-six times since 1826 for membranous croup and nine children survived. Trousseau said, "If we suppose croup to have arrived at such a stage that death is imminent the event may be retarded by tracheotomy."

Trousseau later became professor of clinical medicine in the Faculty of Medicine, Paris, and a great part of his clinical lectures were given in the Hôtel Dieu of Paris. These lectures covered many different diseases. Trousseau's method of lecturing and writing made his students profoundly enthused with his work. His remarkable power of observation, his ability to make new discoveries, and most of all, his knowledge of therapeutics made him one of the foremost physicians of the world. The lectures were published in 1868 in five volumes and are now very rare, likewise his several volumes called *Traité sur Therapeutics* which were published in 1880, were not only very valuable at that time but at present it is difficult to find a modern work in therapeutics which contains as much valuable information as that written by Trousseau.

The wave of nihilism now seen with therapeutics could be overcome if the physicians of today possessed the therapeutic knowledge of this French master. It would be unfair, however, to depreciate

modern medicine, but a careful study of the writings of Trousseau would show that in therapeutics he was fully as capable, with few exceptions, as the modern therapist. Trousseau believed in his remedies and applied them empirically. It was only by experience that he could tell whether a remedy would be rational. The so called "Trousseau's diuretic wine" is one of his most valuable remedies, and today is used with excellent success at the Hôtel Dieu, Paris. The power of observation in clinics gave these older physicians fully as much knowledge as our modern methods of diagnosis. Owing to the lack of instruments of precision, however, they were forced to spend more time in observation.

What Is Clinical Medicine? was the title of a famous lecture at the Hôtel Dieu by Trousseau, and the following extracts from his lecture are well worth reading:

Although the clinic is the keystone of medical study, I would not wish you to suppose that it ought to be deferred till you have nearly reached the close of your curriculum as students. From the day on which a young man wishes to be a physician, he ought to attend the hospitals. It is essential to see, to be always seeing, sick persons. The heterogeneous materials, though amassed without order or method, are nevertheless excellent materials; they are for the present useless, but you will, at a later date, find them stored in the treasure house of your memories. I am now an old man, yet I remember the patients whom I saw forty years ago, when on the threshold of my career. I recollect their principal symptoms, their anatomical lesions, and the numbers of their beds, and sometimes the names even of the patients come into my mind, after that long interval of time. These recollections are of service to me; they still afford me instruction, and you sometimes hear me appeal to them at our clinical meetings.

The young man is attracted by the display of surgical operations; the pomp of preparation, the dexterity of the surgeon, the immediate conquests which he achieves, combine to strike and bewitch the youthful imagination; but, so far as instruction is concerned, the performance which he has witnessed is barren. I have always observed that young men were more delighted by those operations which demand no more intelligence than is required by a butcher's lad to cut up an ox than by those wonderful proceedings, those delicate and thoughtful manipulations, the ability to perform which constitute the real surgeon, and which strike with admiration the thoroughly informed who can understand and appreciate them. You will not, then, derive real benefit from frequenting the surgical wards till you have been initiated in anatomy, while, for studying the rudiments of medicine, it will suffice to have acquired some superficial acquaintance with physiology. The public think it strange to hear physicians speak of the fascination which accompanies the study of our art. Literature, painting, and music do not yield an enjoyment more keen than that which is afforded by the study of medicine, and whoever does not find in it, from the commencement of his career, an almost irresistible attraction, ought to renounce the intention of following our profession.

I would fail in my duty if I did not lay strong emphasis on the words I am now going to utter: To know the natural progress of diseases is to know more than half of medicine. I have long been disposed to doubt the efficacy of medicine in acute pneumonia. Long ago I was tempted to leave nature to bring to a favorable issue in this disease, against which we are all disposed to act so vigorously; but I have not yet dared so to act. Antimonials, emetics, and digitalis, are my chosen weapons; and I should consider that I failed in my duty if, convinced as I am, perhaps erroneously, of their great utility, I did not employ them, that I might see in what manner nature would bring the disease to a conclusion. Every year I am indebted to active, devoted young men for the opportunity of learning facts with which I was unacquainted, and reviewing erroneous views which I had long been teaching. In such opportunities I

find a very agreeable reward for my efforts to be useful, and for the love I bear to my pupils.

Most of the ascertained facts in therapeutics have proceeded from empiricism; but I have taken care to let you understand that, although the primitive fact be purely empirical, its applications pertain to the intelligence of the physician who has discovered them. The inferences, however, from an elementary fact, will only have value in proportion to the extent to which experience is developed; and experience can only be acquired by experimenting. When this view was once acquired—a view, as you have seen, wholly due to experiment—there flowed from it the great therapeutic principle of substitution, which, at present, rules supreme in medical practice. Thus it is that, step by step, therapeutics have become enriched; and it is thus that, day by day, experiment has added one fact after another to our store. When facts were seen to present analogies, and when their relations to each other became understood, groups of systems were formed, which afterwards expanded, and constituted a sort of body of therapeutic doctrine, doubtless leaving beyond its limits many unexplained facts, which must remain provisionally within the domain of empiricism, until they can, at a later date, be placed in a special category and in a general system.

I grieve to see beginners pressing around the beds during the visits which immediately precede the lectures in the theatre, and absenting themselves from the wards on the days on which no public lectures are given. Let me tell you that such a course of proceeding is most unprofitable. You must remember, gentlemen, that hospital patients are poor creatures forced into our wards by distress and want. This fact ought of itself to be enough to conciliate our esteem and inspire our respect for them.

It will be seen that the empiricism of Trousseau has done much to place therapeutics on a rational basis. It is only by continued experimentation that we know whether a remedy will help a disease or not. Thus when the Countess Del Chinchon sent to Rome the miraculous powder which cured her of fever, the matter was only empirical. However, this powder, which was Peruvian bark, as adopted by Sydenham, became one of our chief examples of rational therapeutics. When we find by empiricism that a remedy is beneficial to disease, its application depends upon the intelligence of the individual physician using it. He regulates the dose and method of administration. Trousseau said: "Though empiricism, therefore, has furnished the original suggestion of the employment of cinchona, although up to this day we are quite unable to explain the action of this powerful drug, physicians have taken possession of its unexplained action, have extended its beneficial sphere, and have, with a medicine which is empirical, instituted a system of treatment which is not empirical."

Dothienteria or typhoid fever was given consideration by Trousseau in 1859. The specific lesion was described in the intestine and he spoke of intestinal perforation and peritonitis without perforation. This lecture on typhoid fever is more valuable today than some of the modern treatises on this disease. The question of contagion was discussed and Trousseau said: "The number of disbelievers in contagion is daily diminishing." So far back as 1829, the fact of contagion was announced by Bretonneau, by Gendron, of Château-du-Loir, and by Leuret. Trousseau said: "When the malady is once installed, its propagation goes on by a series of transmissions which are sometimes very easy, and at other times impossible, to follow." In uncomplicated cases of mild nature, Trousseau said: "Recovery takes place spontaneously; and a judicious physician will avoid disturbing the curative

efforts of nature by unseasonable meddling. On the other hand, when the cases are severe, the disease often shows threatening tendencies as it advances, and then our interference may be of real benefit." This statement made by Trousseau is very valuable today. When a disease is selflimited we should not interfere with it. Trousseau endeavored to teach his pupils to study the natural course of disease in order that they would know when to begin active treatment. The lectures on tracheotomy in diphtheria and also diseases of the stomach are very valuable today, especially "simple chronic ulcer of the stomach." He gave excellent lectures on syphilis in infants, gout, nodular rheumatism, and ulcerating endocarditis.

Trousseau lectured on contagion, not including parasitical diseases; spontaneous development of morbid germs, infection; infectious diseases becoming contagious; the dormant state of germs; immunity, temporary and absolute; conditions as to age and previous contamination; direct inoculation and inhalation. It will be noted from these headings that Trousseau in 1853 had an excellent clinical knowledge of infection. His lecture On Aphasia should be copied today as it is still as valuable as many present teachings on this subject. The unusual ability of studying cases clinically gave Trousseau a style of lecturing and writing that impressed his pupils.

GEORGES DIEULAFOY.

Armand Trousseau gained much of his knowledge from his learned master, Bretonneau. In later years at the Hôtel Dieu of Paris, Professor Trousseau had as his pupil an able physician, Georges Dieulafoy, who later succeeded Trousseau as professor of clinical medicine at the Faculté de Médecine de Paris and physician to the Hôtel Dieu. Dieulafoy was associated with Trousseau and spoke of him as his "venerated master." Dieulafoy gave many new things to the practice of medicine, especially in his study of syphilis. He was a remarkable teacher and clinician, and when he died in 1911 the world lost one of its most able physicians and possibly the most able one at that time.

From about 1820 to 1911 we have a school of French medicine which we believe was the greatest the world has ever produced in general practice. The expansion of Bretonneau's work by Professor Trousseau and the further work by Dieulafoy brought the original work of Bretonneau and Trousseau to a modern treatise on clinical medicine, giving an incomparable line of medical experience. These men were keen observers, loved their work as an artist loves his art, and practised medicine from the true spirit of art devoid of any commercial inclinations. Their work today is more valuable than the average work on medicine that is called modern. Most modern treatises are simply the older works rearranged. These physicians believed in therapeutics and by continual study of remedies grew each day to have more faith in medicines. The modern wave of therapeutic nihilism could be corrected if instructors in medicine would study and recapitulate the old lectures on therapeutics as delivered by this famous school of French physicians.

THE INTRAMUSCULAR INJECTION OF A FOREIGN PROTEIN, CROTALIN, IN 300 CASES OF EPILEPSY.

Certain Nonspecific Phenomena and Therapeutic Results.

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The treatment of disease by the hypodermic injection of various foreign proteins into the human system has been given considerable attention by laboratory workers, as well as clinicians, for the past two or three years. The foreign proteins employed have included those of bacterial, vegetable, and animal origin.

Snake venoms were thoroughly investigated, by S. Weir Mitchell in 1860 and Mitchell and Reichert in 1883, but only in recent years have they aroused considerable attention because of their similarity to the bacterial toxins and because of the aid which their study has given to immunologic problems. Mays, in 1908, I believe, first used a solution of the dried venom of the rattlesnake, crotalin, hypodermically in the man. While working with Mays, after reading that Self, of Texas, had reported the cessation of attacks in an epileptic who had been bitten by a rattlesnake, the writer gave his first hypodermic injection of crotalin solution in March 12, 1909. The patient was a girl, eleven years old, who had been having two to five epileptic convulsions a week. The injections of crotalin were continued at weekly intervals for four months. It has now been over eight years since a convulsion has occurred, and when I recently examined the patient, I found a splendidly developed young woman of nineteen years, enjoying the best of health.

Clinical results from my early empirical use of crotalin warranted further investigation and careful study in an effort to account for its therapeutic value. It has been my privilege to study and treat in private practice, during the past eight years, over 400 epileptic patients, from thirty-eight States and foreign countries. To these patients more than 10,000 hypodermic injections of crotalin solution have been given intramuscularly. Routine laboratory examinations and blood counts have been made, and their findings carefully recorded. It is my purpose in this communication to point out the effect of hypodermic injections of venom protein, crotalin, in the human system, to compare their reactions with those of the bacterial proteins, to record certain nonspecific phenomena resulting from their use, and especially to report the study of over 4,000 differential leucocyte counts made in a series of 300 cases, before, during, and after the patients received the venom protein injections.

Foreign proteins for therapeutic purposes.—For several years the action of various protein substances, when injected in the human organism, has been extensively studied. A wide variety of tests have shown that injections of various vegetable, bacterial, and animal proteins into the human body set up certain reactions which tend to establish a greater or less resistance to toxin. Beebe and Williams (1)

have obtained some striking results in the treatment of cancer by the injection of vegetable proteins. Vaughn (2), of Ann Arbor, has given much study to the effect of foreign proteins and his experiments promise to influence the therapy of many ailments. The literature of the subject contains many instances showing that in the treatment of infectious and toxic conditions, both acute and chronic, beneficial results have followed the use of nonspecific substances, but since these were not in keeping with the prevailing conceptions of specificity they were stamped for disapproval by the medical profession.

For example, Kraus (3) found that typhoid patients recovered with the use of colon vaccine and that typhoid vaccine greatly benefited certain cases of pelvic inflammation. Ludke (4) used a deuterioalbumose, a nonbacterial protein split product with good results in typhoid. Miller and Lusk (5) produced beneficial results in acute and chronic arthritis by intravenous injections of typhoid vaccines and proteoses. L. D. Smith (6) has shown that in gonorrheal infections an anaphylactic reaction obtained with normal horse serum is of great benefit, provided only that the allergy is sufficient.

Results have been obtained with suspensions of various organisms, normal horse serum, various solutions of vegetable and animal proteins, all of which have been followed by more or less improvement. At first it was concluded that these were specific responses, but at present they are pointed out as nonspecific and of the same character as the results following the injection of any foreign protein. Body cells were formerly regarded as the source of antibodies, but Becht and Leuckhart (7) have shown that the hematopoietic organs are the chief source, and anything which stimulates them floods the body and blood with antibodies and overcomes infection or neutralizes toxins. Dunklin (8) finds that the injection of proteoses in immunized rabbits causes a marked increase in the antibodies. Hence, as Jobling and Peterson (9) point out, the mechanism in producing beneficial results in toxic or infectious conditions, by the injection of foreign proteins, depends on a selective stimulation of the hematopoietic system by nonspecific substances, resulting in the production of specific antibodies and allergic phenomena. Mathers (10) says that there is no evidence that the specific in any way excels the nonspecific antigen.

The beneficial result following the use of vaccines has usually been explained as the specific response of the body to its autogenous virus. If, however, arthritic cases show definite improvement with typhoid vaccine and typhoid conditions can be modified and cleared up with colon vaccine or normal horse serum, we are forced to admit that such reactions are nonspecific and purely protein in nature. Several theories have been advanced to explain the disappearance of previous symptoms of disease, following the injection of foreign proteins, and they are summed up as follows by Irons (11):

Jobling and Peterson have shown that the serum proteose of the blood is increased by intravenous injection of protein, and suggest that the ferment normally held in

check by antiferment is freed by the removal of the latter, and at once acts on the toxic fever producing substances in the body, breaking them down to nontoxic elements. The hyperleucocytosis which accompanies the reaction has also been held to accelerate the phagocytic removal of invading bacteria. This seems to be largely a nonspecific factor. There is also some evidence to indicate that the reaction produces indirectly a specific effect by mobilizing or calling into action specific immune substances which have already been formed, but have not developed their maximum effect in the body of the patient.

At the present time unstandardized bacterial proteins, in the form of vaccines, are being used for all sorts of diseases. If, therefore, it is desirable to use a foreign protein for therapeutic purposes, one should be selected which is standardized and whose dose can be accurately measured and sterilized.

Snake venom being a protein substance, containing a protease enzyme, which is physiologically standardized by the animal itself, would seem to be worthy of consideration when it is desirable to inject a foreign protein into the human body for the purpose of producing nonspecific antigens to counteract toxic conditions, provided, of course, that clinical experience can prove the venom protein to be of definite therapeutic value and that it can be used without danger to the patient.

Mays (12) reports that, in the dried state, snake venom, can be preserved for years without affecting its toxicity. Venoms are, therefore, more staple than the bacterial vaccines and can be handled in exact and definite quantities. From my clinical experience of over eight years, during which time many hundreds of intramuscular injections of venom have been given to more than 400 patients, without a death or serious anaphylactic shock, I am convinced that when one uses a solution of venom which has been preserved with trikresol and which has been found free from aerobic and anaerobic contamination, it can be injected into the human body with every confidence of safety.

Properties and nature of venom protein.—In 1883 Mitchell and Reichert (13) described two poisonous proteins, constituents of venom, one of which seemed to be a globulin and the other a proteose or "peptone." Newman (14) easily separated these two constituents by placing venom, dissolved in a little distilled water, in a cylinder, the lower end of which is covered with animal bladder and stands in another vessel filled with water. The peptone passes through the porous membrane, while the globulin remains behind as a white mass which can be easily dissolved in a little salt water. By mixing the two substances the original poison can be produced again. In testing the effect of these separate constituents upon animals and the human body, he found that the globulin element, in poisonous doses, entirely destroys the power of the blood to clot in animals; but that in minute doses, in animals and man, it tends to lengthen the clotting time of the blood. The writer (15) recorded a study of the effect of venom on the coagulability of the blood in eighteen cases of epilepsy and showed that the venom, given in small doses, hypodermically, lengthens the clotting time of patients' blood.

The second constituent of snake venom, the peptone, in large doses, has a paralyzing effect on the

nerves of animals, but in minute doses the effect is quieting to animals and, as will be discussed later, the peptone or protein substance in venom produces a modified anaphylactic effect in the human body, and has the power to produce a selective stimulation of the hematopoietic organs and alter very decidedly the leucocyte picture.

Flexner and Noguchi (16) have found enzymes in venoms, e. g., proteases and lipases. They have distinguished and classified the various elements as hematoxins, hemagglutinins, neurotoxins, and endotoxins. They regard hematoxins in the nature of an amboceptor that is active with serum complement. They have also demonstrated that blood corpuscles of certain animals undergo hemolysis when a suitable serum is present and believe that the amboceptor of the venom is active with serum complement.

Care in preparation of venom protein for hypodermic use.—Snake venom being an albuminous substance, it is impossible to sterilize it with heat. It is, therefore, necessary to add to a solution of the venom some antiseptic. In the writer's experience the most satisfactory preservative and antiseptic for this purpose is trikresol. The venom is extracted from the living reptile, *Crotalus horridus*. The evaporated, dried, yellowish crystals of the venom are dissolved in sterile water and glycerin, to which is added enough trikresol to keep the solution sterile. This solution is prepared in varying concentrations and put into sterilized ampoules containing one c. c. each, representing 0.0025 grain, 0.005 grain, and 0.01 grain, et cetera, according to the dilution desired by the physician. A bacteriological test of each new lot of venom is made to determine freedom from aerobic and anaerobic contamination. Plates of agar agar are also made in addition to the other tests and allowed to incubate for seventy-two hours. That danger of infection from the solution is practically eliminated is attested by the fact that in using over 10,000 injections I have had no infections or deaths.

Technic of giving injection.—It has seemed best to use an all glass, aseptic, hypodermic syringe and a platinoid needle about one and a half inches in length. The syringe is sterilized by cleansing with alcohol and boiling. The needle is heated over a Bunsen flame or boiled. After breaking off the neck of the ampoule the crotalin solution is drawn into the syringe and after expelling the air, is ready to be injected. The site of injection is cleansed with tincture of green soap and alcohol, or touched with tincture of iodine. The needle is introduced into the muscles at an angle of about sixty degrees, and the contents of the syringe expelled slowly. After withdrawing the needle the wound is covered with Turlington's balsam and a little sterilized cotton.

Site of injection, local reaction, and systemic effect.—It has been my practice to give the injections in the supinator group of muscles of the forearm, as a rule using the right and left arm alternately. The degree of local reaction obtained varies with the individual susceptibility of the patient. In most cases the patient complains of a slight burning or stinging sensation at the site of

the injection, and this sensation frequently radiates for a few inches up and down the forearm. This discomfort lasts but a few minutes, and no further effect is noticed for from two to six hours, when a swelling and slight erythema appear. The degree of cellulitis thus produced varies greatly in different subjects, and a variance in susceptibility is often shown from time to time in the same individual. In the average patient the maximum amount of local reaction is obtained in from twenty-four to thirty-six hours after an injection, and by the third or fourth day the part, in which the injection was given, will usually have regained its normal condition. Systemically no chill or rapidity of heart action follows an injection. Occasionally there is a slight elevation of temperature amounting to one or two degrees for from twelve to twenty-four hours, but in most cases the normal temperature range for the patient is not disturbed. As will be pointed out later no leucocytosis accompanies or follows the local reaction and if there is any tendency to anaphylaxis it is of a very modified form.

Dose.—In the average adult case I usually give 0.0025 grain of crotalin in solution at the first injection. In children, anemic adults or plethoric subjects, I frequently use only 1/600 grain for the initial dose. The second treatment should not be given until all evidence of local reaction from the first injection has disappeared. As a rule it is best to wait at least seven, and in some instances ten days before administering the second dose. It is wise not to increase the strength of dose at the second treatment in order to judge of the patients susceptibility, and to guard against any possible tendency to anaphylaxis.

Early in my experience with crotalin the question arose: Is there any scientific method to guide the physician in regulating the strength of dose and the frequency with which injections should be administered? It was evident that to depend on the degree of local reaction or one's clinical experience was unsatisfactory. My work was criticised on the ground that "all venoms have a hemolytic effect" and because, theoretically, it was thought there might be danger from a possible anaphylaxis. Three deaths were reported by other physicians in various parts of the country, caused by infection following the use of nonsterilized crotalin solutions given in large doses of from 0.04 to 1/15 of a grain.

Effect of venom protein on the blood.—Since 1912, therefore, I have been studying very carefully the effect of crotalin injections on the blood of epileptic patients. It has been my rule to count the red and white cells, to estimate the hemoglobin and make a differential leucocyte count before any crotalin is used. White counts are also made at the time of the local reaction and after it has subsided. Differential leucocyte counts are made at regular intervals after injections and the proportional relation of the white cells noted and compared.

In going over the records, in a series of 300 of my cases, I find that 382 complete red blood counts and estimations of hemoglobin were made. 963 leucocyte counts were recorded, and 4,621 differ-

ential leucocyte counts made. To the 300 patients 6,538 injections of crotalin were given over periods of time ranging from one month to five and a half years. Fifty-two patients in the series were under treatment for one year or over; fourteen between nine months and a year; twenty-five between six and nine months; sixty between three and six months; 110 between one and three months; thirty-nine for at least one month. The least number of

While crotalin injections, ranging from 0.0025 to 0.02 grain, do not produce a leucocytosis, crotalin does have the power decidedly to alter the proportional relation of the white cells in the differential leucocyte count, with a special tendency to increasing the eosinophiles. An analysis of the differential leucocyte counts in 100 of the cases in the above series to whom ten or more injections of crotalin were given is summarized in the following table:

TABLE I.
RANGE AND AVERAGE OF DIFFERENTIAL LEUCOCYTE COUNTS IN 100 CASES OF EPILEPSY.

Cell	Normal range (Howell) Percentage	Range in 100 cases of epilepsy before and after using crotalin.						Average for the 100 cases		
		Within normal limit		Below normal limit		Above normal limit		Before using crotalin %	After using crotalin %	Within 24 hrs. after a seizure %
		Before	After	Before	After	Before	After			
Poly-morphonuclear . . .	60-75	.84	.26	..	..	16	74	61.82	50.83	72-72
Small lymphocytes . . .	20-25	.55	.41	.40	.33	5	26	26.44	24.85	18-40
Large lymphocytes . . .	1 or less	6	2	94	98	..	..	8.55	8.14	6-20
Eosinophiles . . .	4 or under	.97	..	..	100	3 absent	..	1.85	15.05	1-57
Basophiles . . .	1 or less	100	100	..	..	..	..	.56	.47	.34
Transitionals . . .	2 to 10	.55	.45	..	..	.45	.55	.78	.66	.68

injections given to any one of the cases reviewed in this series was three and the greatest number given to any individual patient was 317. In the series thirteen patients received over 100 treatments; 18 received between 50 and 100 treatments; 8 between 40 and 50; 15 between 30 and 40; 22 between 20 and 30; 91 between 10 and 20; and 132 received between 3 and 10 injections.

A careful analysis and study of the effect of crotalin on the blood in this series of 300 cases reveals many interesting facts. Because all venoms, in large or poisonous doses, have a hemolytic effect does not warrant the assumption that crotalin in small doses is dangerous and that its use should be prohibited for therapeutic purposes. On the contrary, it has been found, in doses of 0.0025 to 0.02 of a grain, that crotalin produces no hemolytic or dangerous results as attested by the fact that in the present series more than 6,000 injections were given, at weekly intervals, for from one month to five years to 300 patients, none of whom showed any destructive changes in the blood. In fact, when bromide or other sedative treatments were withdrawn, these cases, under the effect of crotalin, showed uniformly an improvement in the hemoglobin content of the blood and an increase in the number of red cells, with no crenation or evidence of hemoglobinemia.

In a former article (17) I reported a series of 100 cases of epilepsy in which the leucocyte counts, during interparoxysmal periods, ranged between 3,650 and 9,360. At the time of an epileptic attack and usually for from twelve to twenty-four hours after the convulsion a leucocytosis develops running as high as 15,000 or 20,000 and at times reaching even 40,000 leucocytes in a cubic millimetre in the peripheral blood. In studying the leucocyte counts made twenty-four to forty-eight hours after crotalin injections in the present series, I find that only a normal variation—3,760 to 8,350—in the total number of white cells occurred, unless an epileptic seizure intervened. The bacterial proteins produce a leucocytosis when injected into the human body, with an increase of the polynuclear cells in the differential count. The stimulating effect of venom protein on the hematopoietic organs is, however, quite different.

Howell (18) gives a range of sixty to seventy-five per cent. as what may be considered normal for the polynuclear leucocytes. It will be noted in the above summary, before using crotalin that in eighty-four per cent. of the cases in this series, the polynuclears are within the normal limit and that in sixteen per cent. they fall below the normal range. The average for the series, however, before using crotalin, was 61.82 per cent., which is close to the low limit of Howell's normal range. After using Crotalin only twenty-six per cent. were within the normal limit and seventy-four per cent. were below Howell's normal range. The average for the series after using crotalin, was 50.83 per cent., which is about ten per cent., under Howell's low normal limit.

The small lymphocytes, for the series, averaged 26.24 per cent. before crotalin was given. This is only slightly above the high limit of Howell's range. After using crotalin they averaged 24.85 per cent., which is within the normal range of twenty to twenty-five per cent. The large lymphocytes, according to Howell, are normally one per cent. or less. In this series only six of the 100 cases fell within the normal limit before using crotalin and ninety-four were above the normal range. After using crotalin there was practically no change, two falling within normal limits and ninety-eight above. The large lymphocytes averaged 8.55 per cent. before, and 8.14 per cent. after using crotalin.

The eosinophiles, regarded by Howell as being a subdivision of the polymorphonuclears, were within the normal limit of four per cent., or under, in ninety-seven of the cases before using crotalin and in three of the counts no eosinophiles were found when 200 leucocytes were counted. After using crotalin the eosinophiles were above the normal limit of four per cent. in all—100—of the cases. The counts recorded after using crotalin were made within forty-eight hours after an injection was given. The eosinophile cells averaged 1.85 per cent. before using crotalin and the average for the 100 cases after using crotalin was 15.05 per cent. The basophile and transitional forms showed practically no variation before and after the use of crotalin and fall about within the normal range in both instances.

It is most interesting and instructive to note the effect of epileptic attacks on the proportional relation of the cells in a differential leucocyte count. In this series of 100 cases, who were receiving cro-talin injections, differential leucocyte counts were made in each case within twenty-four hours after a convulsive seizure and are summarized in the last column of the above table. The polynuclears averaged 72.72 per cent. after attack in the 100 cases. This is near Howell's high limit in the normal range and is eleven per cent. above the counts made in interparoxysmal periods in the same cases, before any cro-talin was used. In nine of the 100 cases the polynuclears, a few hours after a seizure, were as high as ninety per cent. The small lymphocytes averaged 18.40 per cent., which is a little below the low limit of the normal range. The large lymphocytes remained above the normal limit and averaged 6.29 per cent. The eosinophile cells dropped decidedly at the time of attacks. In twenty-six of the 100 cases no eosinophile cells were found in counting 200 leucocytes. The eosinophiles in the series averaged only 1.57 per cent. following attacks. The percentage of basophile and transitional cells was uninfluenced by the occurrence of an attack and averaged 0.34 and 0.68 per cent., respectively.

Toxic manifestations of epilepsy.—In an article (19) I pointed out that while the exact nature and origin of the toxin in epilepsy is at present undetermined, nevertheless from clinical observations including the presence of a fluctuating subnormal temperature, slow pulse, low blood pressure, shortened clotting time, and lowered alkalinity of the blood, together with constipation and its associated manifestations—all recognized evidences of a low grade toxemia—I believe that many of the attacks, in the so called idiopathic cases of epilepsy, are caused by a toxin which is carried in the blood. As further evidence that the blood of epileptics contains a toxin, I cited two instances of accidental transfusion of blood from epileptic to nonepileptic individuals, in both of which cases typical attacks of epilepsy were produced.

In addition to the above clinical observations pointing to the presence of a toxin in the blood of epileptics, the occurrence of a leucocytosis following most of the attacks, with or without the convulsive element, and the decided increase in the polynuclear cells in the differential count (see Table I) lend convincing evidence that a toxin in the blood is an etiological factor in epilepsy.

Moreover, with the view of ascertaining the degree of toxicity common to epileptic's blood, Boston and Pearce (20) inoculated rabbits with the blood of epileptics, at the time of an attack, and record the following interesting observations: After each inoculation they found that a leucocytosis, which fluctuated between 10,000 and 18,000 for twenty-four to seventy-two hours, occurred. Differential leucocyte counts, made during the time of this leucocytosis, were found to show a twenty to fifty-four per cent. of eosinophile cells. The rabbits inoculated did not develop actual convulsions, a fact which will be referred to later. As control tests Boston and Pearce injected the blood of two non-epileptics into the peritoneal cavities of two healthy rabbits. A daily examination of the blood of these

rabbits was made for one week and showed no leucocytosis nor any tendency to eosinophilia.

From an analysis of Table I and the above blood findings, the following deductions can be drawn: Cro-talin injections, in small doses of 0.0025 to 0.02 grain, do not produce an hemolytic effect. Cro-talin injections do not produce a leucocytosis, but markedly alter the proportional relation of the differential count and cause a decided increase in the eosinophile cells. The toxic blood of an epileptic patient when injected into animals produces a leucocytosis, 10,000 to 18,000 in Boston and Pearce's experiments, with a twenty to fifty-four per cent. of eosinophile cells in the differential count. In man, during interparoxysmal periods, in cases of uncomplicated epilepsy, there is no increase in the leucocyte count above the normal range—6,000 to 8,000—but at the time of an epileptic attack as a rule we find the total number of leucocytes increased to 10,000 or 15,000, and at times they reach 30,000 or 40,000, with an eighty or even ninety per cent. of polynuclear cells in the differential count, but no increase in the eosinophile cells and frequently—twenty-six per cent. of the cases in the present series—a total absence of eosinophiles.

Function of eosinophile cells in epilepsy.—The value of making differential leucocyte counts after injections of venom protein, in order to determine the degree of eosinophilia resulting, is most important. It has been found practicable to regulate the strength of dose and frequency of administration of cro-talin by the degree of eosinophilia produced. As a rule in the average case an injection of cro-talin may be given every five to seven days, but occasionally an injection will be followed by a rise in the eosinophile cells to twenty or thirty per cent., and it will require from ten to fourteen days until the percentage of eosinophiles returns to the normal—four per cent. or under. At such times the intervals between injections must be lengthened to correspond to the return of the eosinophile cells to about the normal range.

As pointed out in the table, it has been my experience while carefully watching the differential leucocyte counts, in cases of epilepsy, to find, at the time of a seizure that the percentage of eosinophiles will drop to one or two per cent., and in about twenty-five per cent. of the cases they will be entirely absent. At this time when an attack has occurred, the total number of leucocytes is often increased to 12,000 or 15,000 or more (leucocytosis) and the polynuclears run as high as seventy-five or eighty per cent., and at times may even reach ninety per cent., of the total number of white cells. These facts I believe to be of a special significance, when it is borne in mind that Boston and Pearce found that by injecting the blood from an epileptic patient, at the time of attack, into rabbits, a general leucocytosis resulted with an increase in the number of eosinophile cells—twenty to fifty-four per cent.—in the differential count and the rabbits developed no convulsions.

The cases of epilepsy in my experience which have received the most benefit from cro-talin, are those in which a ten to twelve or fifteen per cent. of eosinophilia develops twenty-four to forty-eight hours after an injection. In view of this clinical

TABLE II.
TABULATED SUMMARY OF 25 CASES OF EPILEPSY TREATED WITH INTRAMUSCULAR INJECTIONS OF VENOM PROTEIN (CROTALIN).

Case number.	Sex.	Age.	Range of dose (grs.)	Number of injections.	Maximum degree of attack after treatment produced 48 hours after an injection.	Duration of epileptic attacks before crotalin treatment was started.	Frequency and interval between seizures the year before crotalin was used.	Number of convulsions while receiving crotalin.	Length of time since crotalin was discontinued.	Results.
1.	M.	25	1/400-1/200	25	13	9 years	8 for year; 4 week to 3 mo. intervals.	One in 6 months.	3 years.	One attack 11 mos. after stopping treatment. None since (25 months).
2.	F.	26	1/400-1/300	24	12	1 year	5 attacks for year; 4 last 6 months.	None during 13 months.	2 years.	No attack since starting crotalin (3 years, 1 month).
3.	F.	17	1/300-1/75	76	8	3 years	3 during year.	Four in 3 years	Still under treatment.	The 4 attacks have occurred at intervals of 19, 2, 1 and 13 months.
4.	M.	23	1/400-1/100	99	13	2 years	11 for year; 7 last 3 months.	10 first 6 months of treatment; None since.	2 years.	No attacks for 5 years
5.	M.	24	1/400-1/50	76	28	12 years	16 attacks for yr.; 2 to 6 week intervals.	Six 1st year. Nine and " Four 3rd and 4th "	Has been receiving one treatment a month for 3 years.	24 attacks during 4 years.
6.	M.	16	1/200-1/75	32	10	4 years	3 for the year.	None during 11 months.	3 yrs, 6 mos.	No attacks since starting crotalin (4 years, 5 months).
7.	F.	45	1/200-1/50	66	13	15 years	16 attacks for yr.; 1 week to 2 mo. intervals.	3 attacks for year; 2, 3, 4 mo. intervals.	Still receiving an injection every 5th day.	3 attacks during 1 year of treatment.
8.	M.	32	1/200-1/75	46	10	5 years	7 for year; 6 to 8 weeks apart.	One 1st year. Two 2nd " Two 3rd "	Has been receiving one treatment a month last 2 yrs.	5 attacks in 3 years.
9.	M.	36	1/400-1/100	30	9	2½ years	7 for year; 1 to 3 months apart.	3 attacks during one year of treatment; 2, 3, 7 mos. intervals.	15 months.	2 attacks since stopping treatment at 9 month and 4 month intervals.
10.	M.	23	1/200-1/50	302	13	Since Infancy	35 for year; series of 2 or 3 to 6 attacks every 2 to 4 weeks.	Six 1st year. Three 2nd " Four 3rd " One 4th " Two 5th "	Still receiving injections once a week.	Has had 16 convulsions in 5 years.
11.	M.	20	1/400-1/100	42	9	8 years	8 for year; 4 wks. to 2 mos. apart.	None.	3 years.	No attacks in 4 years.
12.	F.	28	1/400-1/75	120	22	5 years	8 attacks for year.	Nine 1st year One 2d "	6 months.	No attacks in last 15 months.
13.	M.	3	1/800-1/400	36	14	2 years	Series of 5 or 6 convulsions 6 wks. to 2 mos. apart.	None.	2½ years.	No attacks in 3 years and 3 months.
14.	F.	16	1/400-1/100	85	23	2 years	6 for year; 4 wks. to 3 mos. apart.	5 attacks in 3 yrs. and 4 mos.	Has been receiving injections every 2 wks. for last 2 yrs.	The intervals between attacks have been 9, 13, 12, 4 and 2 months, respectively.
15.	M.	35	1/300-1/100	26	16	9 years	5 attacks for year; 2, 3, 7 mo. apart.	1 in 7 months.	4 years.	5 attacks in 4½ years.
16.	M.	32	1/400-1/200	108	14	18 years	7 for year; 1 to 3 mos. apart.	1 during 2½ yrs. treatment.	1½ years.	No attacks for 3 years.
17.	F.	24	1/200-1/50	54	9	7 years	18 for year; 2 to 4 weeks apart.	3 in 2 years.	3 years.	Has had 2 attacks during 3 years of no treatment.
18.	M.	28	1/100-1/50	94	11	12 years	9 for year; 1 week to 6 week intervals.	7 first year; 3 in 2 mos. second yr. None for next 12 mos.	1½ years.	No attacks for 2 years and 9 months.
19.	M.	25	1/200-1/100	28	8	12 years	15 at intervals of 1 week to 2 mos.	1 in 7 months.	3½ years.	No attack for 4 years.
20.	F.	43	1/400-1/100	70	41	11 years	17 attacks for yr.; in series of 3 or 4, 6 weeks to 3 mos. apart.	1 attack first 7 mos.; 5 next 5 mos (no series); 1 attack during next 12 mos.	2½ years	No attack for 3 years.
21.	M.	24	1/200-1/100	115	16	6 years	19 for year; 10 days to a month apart.	13 first 6 months. None since.	2 years.	No attack for 3 years and 6 months.
22.	M.	18	1/400-1/100	35	11	2 years	22 for year; 1 week to a month apart.	4 in 9 months.	1 year.	Has had an attack every 6 to 8 weeks since stopping crotalin.
23.	F.	23	1/300-1/100	104	20	7 years	7 for year; 1 to 3 months apart.	6 attacks first yr. None since.	Continuing treatment every 2 wks.	No attacks for 3 years and 5 months.
24.	F.	34	1/400-1/100	28	8	7 years	12 for year; 2 to 7 week intervals.	4 first 5 months. Then 4 mos. interval. None since.	6 months.	No attacks for 8 months.
25.	M.	37	1/200-1/100	46	13	10 years	9 for year; 4 to 6 week intervals.	No attacks since starting crotalin.	Receiving weekly injections.	No attacks for 11 months.

experience and from the reduction or absence of eosinophile cells noted in the differential leucocyte counts following epileptic attacks, it would appear that the patient afflicted with epilepsy cannot, or has lost the power to produce, eosinophile cells. In an epileptic patient, at the time of an attack when his system is overwhelmed with toxin and a general leucocytosis results, there is an increase in the poly-

nuclear cells in the differential count, but a reduction or absence of eosinophile cells. In an animal, however, injected with the toxic blood from an epileptic patient, who has just had an attack, there develops a leucocytosis with a marked increase of eosinophile cells—twenty to fifty-four per cent.—and no convulsion occurs.

One is justified in concluding from these facts

that if the leucocytosis, which is caused by the stimulating effect of the toxin in an epileptic's blood at the time of an attack, can be of an eosinophilic type, as demonstrated by the animal experiments, instead of the polynuclear type, which occurs in man at the time of an attack, that the toxin in the blood is neutralized and the possibility of a convulsion occurring is greatly lessened.

To recapitulate, therefore, I have shown:

Venom protein—crotalin—when injected, in small doses intramuscularly, has the power to excite an absolute increase in the eosinophilic leucocytes in cases of epilepsy.

At the time of an epileptic seizure a leucocytosis occurs with an increase of polynuclear cells in the differential count, and a reduction or absence of eosinophilic cells.

Animal experiments have shown, after the injection of blood from an epileptic patient at the time of an attack, that a general leucocytosis is produced in rabbits, with a twenty to fifty-four per cent. of eosinophilic cells in the differential count and no development of convulsions.

The following twenty-five summarized cases of epilepsy, which have received from twenty-four to 302 injections of crotalin and whose differential leucocyte counts show an eight to forty-one per cent. of eosinophilic cells, within forty-eight hours after an injection, have had the interval between convulsions lengthened, the severity of the seizures modified, and in fifty per cent. of the cases the attacks have been absent for from two to five years.

The twenty-five cases in the above tabulated series had a total of 263 convulsions the year before the venom protein injections were used. During the first year while crotalin was being administered the attacks were reduced to eighty-three, an improvement of 68.44 per cent. Five of the patients in this series have had no attacks since crotalin was started, viz., Case II has been free from attacks for three years and one month; Case VI for four years and five months; Case XI for four years; Case XIII for three years and three months; Case XXV, which is still under treatment, has gone eleven months without an attack.

Patients who have been afflicted with epilepsy for periods of only five years or less before the crotalin treatment was started have responded more promptly to the treatment, have had the severity of the attack most modified, and have gone the longest periods of time without seizures. Cases II, III, IV, VI, VIII, IX, XII, XIII, XIV, XXI and XXII in the above series are such examples. On the other hand patients who have had epilepsy since infancy or in whom the duration of the trouble had antedated the crotalin treatment for periods of time varying from seven to fifteen or eighteen years have shown very gratifying modifications in the frequency and severity of the attacks. In some instances, for example Cases I, XI, XVI, XVIII, XIX, XX and XXIII, they have been free from seizures for periods of time ranging from two to four years.

The minimum number of venom protein injections given to any one of the twenty-five cases in the above series was twenty-four and the greatest number was 302. The continuous administration

of venom protein injections, at intervals varying from five days to one month, extended over periods of time from six months to five years. Not any of my patients have shown clinical evidence of harmful results or have had any serious anaphylactic manifestations. They have gained in weight, their general metabolism has improved, and their mental faculties have been decidedly benefited. The blood examinations have shown no dyscrasia. The hemoglobin content of the blood was improved and the number of red cells increased. The modification and alteration of the leucocytes, as a result of the crotalin injections, has been discussed and pointed out in detail in the body of this paper.

GENERAL CONCLUSIONS.

Crotalin is a venom protein, which is physiologically standardized by the animal and can be satisfactorily sterilized and its dose accurately measured. It may be injected intramuscularly, in small doses, into the human being without causing deleterious local or systemic results.

Intramuscular injections of small doses of venom protein produce a local reaction, with varying degrees of swelling and erythema, at the site of injection, but only a mild systemic disturbance. The injections can be repeated, at weekly intervals, for months with no hemolytic effect or danger from anaphylaxis.

Crotalin injections, in small doses, do not cause a leucocytosis, but do produce a selective stimulation of the hematopoietic organs, causing a relative and absolute increase of the eosinophilic cells in the differential count.

The dose and frequency of administration of venom protein may be regulated by the degree of eosinophilia produced.

The blood of an epileptic patient, at the time of a seizure, contains one or more toxins as shown by clinical manifestations, animal experiments, and the presence of a leucocytosis with increase of the polynuclear cells in the differential count.

Venom protein—crotalin—injections, in properly regulated doses tend to reduce the percentage of polynuclear cells in the differential count and produce an increase of the eosinophilic cells. The eosinophilia produced seems to have the power to neutralize the epileptic toxin, probably by the formation of antibodies, and thus prevents or lengthens the interval between and modifies the severity of the epileptic attacks.

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SYPHILIS IN RELATION TO MENTAL DISEASE.*

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Syphilis has long been recognized as an important etiological factor in mental disease. With the refinement of diagnostic methods by the addition of the precise laboratory tests for syphilis, the etiological significance of syphilis in mental disease has become more firmly established. The relationship between syphilis and insanity cannot be emphasized too strongly. Here the cause is clearly a preventable one and in prophylaxis largely rests the hope of the future in combating the increasing problem of the insane. The limits of this paper will not admit an extended discussion of the different clinical manifestations of the syphilitic infection in the psychoses. It is its purpose, however, to outline the types of psychoses and to direct the attention to the importance of taking widespread prophylactic measures against syphilis, with some suggestions as to ways and means from the standpoint of mental hygiene.

That the syphilitic infection is prevalent to a startling degree in the community at large is undoubtedly true, but estimates as to the actual number of cases vary too greatly to be conclusive. Moreover, even though the number of syphilitics were known, it would be impossible to estimate accurately the percentage of nervous and mental cases liable to develop, as there appear to be many other factors, such as race, individual susceptibility, and possibly the influence of associated habits such as alcoholism and other conditions which seem to have a bearing in determining whether the nervous system is involved, which portion, and to what extent it is attacked. The results of Wassermann surveys of communities, institutions, or other groups of individuals undoubtedly represent to a certain degree the percentage of luetic infection among these persons. Here again, however, no generalization can be made and marked variations will be found due to differences of technic, the personal equation of the examiner, racial or community peculiarities of those examined, and so on. For instance, in the matter of racial difference alone, in southern communities the prevalence of syphilis in the negro is so marked that it is customary to regard each individual as syphilitic until proved otherwise. Even in the negro race, however, the percentage of a positive Wassermann reported by different writers varies greatly, depending apparently upon the examiner and his methods. In any case one should remember that in the psychoses as well as in other conditions a positive Wassermann does not always mean that syphilis is the most important causal agent. It may be merely incidental.

Although the uncertainties of statistical studies are apparent and care must be taken in making general applications from the conclusions reached, yet the findings are suggestive and should always receive due consideration. Some time ago, Dr.

Thomas W. Salmon cited the investigations conducted in the records of the Austrian army. Between 1880 and 1890, 4,134 officers had contracted syphilis and in 1912, it was found that of this number about 4.9 per cent. had developed general paralysis. In a recent edition of Nonne's work, it is stated that in fifteen to twenty-five out of every 1,000 cases of syphilis cerebral manifestations develop.

At the Connecticut Hospital for the Insane, Middletown, the Wassermann test is made upon the blood serum of every patient admitted. During the past year, about twenty per cent. have been found to be positive. On the other hand, a survey of the entire patient population of the New Jersey State Hospital at Trenton in 1911 and 1912, consisting of 1,583 individuals, resulted in only seven per cent. positive, a figure thought by the one who made the survey to represent approximately the prevalence of syphilis in the population of that portion of New Jersey from which the hospital drew its patients. The low percentage of positive reactions may be partially accounted for by the fact that a large proportion of those examined had been in the hospital for some years. The statistical findings of the New York State hospitals as to the number of cases showing a syphilitic etiology may be taken as fairly representative. There was a total patient population under treatment in 1914 of 41,403, the number of first admissions for the year being 6,265 all of which were thoroughly and uniformly examined by a prescribed method and a diagnosis reached at a staff meeting in accordance with a recognized classification. Of the first admissions, 14.4 per cent. were found to have syphilitic etiology. Besides these 12.7 per cent. resulted from arteriosclerosis, of which syphilis is an important causal agent.

During 1914, in the New York State hospitals, 16.16 per cent. of the deaths were due to general paralysis, a disease of syphilitic origin. Salmon called attention to the fact that in New York State in 1913, there were 1,000 deaths from well recognized general paralysis—about as many as died from typhoid fever—with a strong probability of there having been many more which were recorded as something else. Further statistics of a similar nature might be cited almost without end but the foregoing should be sufficient to indicate the importance of syphilis in relation to mental disease.

By far the most common type of psychosis due to syphilis is general paralysis of the insane, or paresis as it is frequently called. Often insidious in onset and protean in clinical manifestations, paresis may be unsuspected until the attention is forcibly directed to the unfortunate individual by some scandalous action, or marked change in habits, disposition, or conduct entirely foreign to his ordinary mode of living. The disease is apt to make its appearance at about the age of thirty-five to forty years, usually some ten years or more after the initial infection, the ordinary course being a progressive deterioration with death in from two to five years. The mental symptoms are so varied that one should always suspect paresis in an individual in whom any psychosis begins for the first time in middle life. While the expansive type with

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megalomaniac features is perhaps popularly believed to be classical, yet as a matter of fact the demented form is much more common. In general the mental symptoms may be characterized briefly as a progressive loss of memory, change and dilapidation of personality, disposition, and behavior, variable emotionality, euphoria, absurd delusions, and profound judgment defects. The physical signs are irregular, sluggish, or Argyll-Robertson pupils, tremors, difficulty in coordination, exaggeration or, in tabetic type, absence of tendon reflexes, and a characteristic speech and writing defect. From time to time, the so called parietic attacks occur which may be epileptoid in character. These parietic attacks may be followed by focal symptoms which, however, are only temporary and quite regularly disappear. The blood serum and spinal fluid should always be examined. In most cases the Wassermann reaction will be found to be positive in both blood and spinal fluid. In the latter, there will be a pleocytosis, the presence of more than ten cells in a cubic millimetre being diagnostic. The colloidal gold and globulin tests will both be positive.

From a pathological standpoint, general paralysis is a chronic inflammatory and degenerative process. In the words of Dunlap, it is "essentially a generalized infection with the spirocheta pallida, in which: the central nervous system stands out more prominently than any other part." There is a general diffuse atrophy of the brain cortex, most pronounced in the frontal region. The pia is infiltrated and there is periarthritis. In the cortex, there is an irregular but active proliferation of new bloodvessels, with marked infiltration about the same, consisting of lymphocytes, plasma cells, and mast cells. There are cell degenerative changes, neuroglia replacement, and new glia formation, especially in frontal regions. Noguchi and Moore first demonstrated the spirochete in the brain substance in paresis, a final confirmation of the syphilitic etiology.

Theoretically cerebral syphilis is to be sharply distinguished from paresis, but clinically the differentiation may be an extremely difficult matter. Cerebral syphilis may be said to be more on the surface as contrasted with the parenchymatous changes of paresis. There are three types, which may be combined to a certain degree: the gummatous, which is rarest, the meningeal, and the vascular, the last consisting of a progressive, girdling, obliterating endarteritis. From the very nature of cerebral syphilis, it will be seen that symptoms of a focal variety, such as paralyses, are more apt to occur. As Dr. Adolf Meyer has pointed out, "The mental symptoms are those of all organic disorders—memory and retention defects, states of confusion, and hallucinations—but with relatively little unaccountable and fundamental change of character and dilapidation of the personality." Henderson states that the Argyll-Robertson pupil is rarely present in cerebral syphilis. The general symptoms, as distinguished from those of paresis, are apt to be: 1, headache, dizziness, and vomiting; 2, cranial nerve palsies; 3, convulsions without loss of consciousness, but usually followed by permanent facial symptoms; 4, intact speech and writing; 5, absence of facial tremor. The blood serum Was-

sermann is positive but that of the spinal fluid negative. Cerebral syphilis is apt to be more acute and occurs earlier than paresis, the onset commonly being two or three years after infection, while in paresis it is often ten to fifteen years.

Tabes dorsalis, or locomotor ataxia, the chronic progressive, deteriorating process of the posterior spinal nerve roots with syphilitic origin may be associated with a paranoid psychotic condition necessitating commitment to a hospital for the insane. By some authorities, tabes and paresis are considered manifestations of essentially the same disease, in tabes the greater severity of the process being localized in the spinal cord, in paresis in the brain. At any rate, the condition arises which may be designated taboparesis in which the mental symptoms of paresis are associated with the physical signs of tabes, such as absent knee reflexes, Argyll-Robertson pupils, Romberg sign, ataxia, crises, and so on, with the usual course seen in paresis.

The question of congenital or hereditary syphilis is of marked importance, especially from a nervous and mental standpoint. Plaut, Mott, and other investigators have clearly shown the pernicious effects of transmitted syphilis upon the nervous system. Where the offspring of luetic parents survive the well known tendency to abortion, stillbirth, and death in infancy, they are liable to show in later years some degree of mental defect ranging from a mild feeble-mindedness, intellectual or temperamental, to such gross types as imbecility or idiocy. Of a series of 208 children of syphilitic parents under observation over four years (Hock-singer), forty-three per cent. had some disease of the nervous system. Among these children were found cases of hydrocephalus, Little's syndrome, epilepsy, paresis, tabes, hysteria, and imbecility. Congenital syphilis of the nervous system may be in evidence at birth and develop in infancy or adolescence, or it may remain dormant only to make its appearance at a later age as the result of some accessory cause as yet not well understood.

Juvenile paresis is a most striking result of inherited lues. A child may develop apparently normally for a few years when not only further progress ceases but there is a decided lowering of mentality. Epileptiform convulsions may lead to an erroneous diagnosis of epilepsy. Various puzzling symptoms such as states of fear, excitement, or depression may arise, accompanied by gradual deterioration, resulting in death in three or four years. A careful neurological examination with investigation of the blood and spinal fluid should clear up all mystery as to the diagnosis and autopsy findings will show the changes found in the adult form of paresis.

There remain yet to be mentioned several forms of mental disturbance, described by Jelliffe under the heading "syphilitic psychoses," characterized by an acute or subacute onset and separated from other similar conditions by a syphilitic etiology as shown by both anatomical and cytological researches of such men as Plaut, Alzheimer, and others. A neurastheniclike state has been described by Kraepelin, beginning rather acutely after infection, with difficulty in thinking, irritability, insomnia, a

feeling of pressure in the head, and variable other pains. This is apt to be accompanied by more or less confusion and depression, with paraesthesias and temperature variations. A delirious confusion may appear during the first year following infection or later, characterized by excitement, fear or anxiety, hallucinations, disorientation, and perhaps homicidal or suicidal tendencies. Korsakoff's syndrome may be found usually without polyneuritic symptoms, but otherwise showing the customary delirious features, with retention defects and a tendency to fabrication being most marked.

Psychoses of the manic depressive type comprise a small group in which the laboratory demonstrates a syphilitic etiology. Patients in a manic condition resemble expansive paretics, while the depressed are especially noticeable on account of the frequent occurrence of hallucinations of hearing, often persecuting in type. Finally, conditions resembling dementia præcox are seen, presenting physical signs which may be overlooked, such as pupillary anomalies, reflex modifications, slight ataxias, or changes in speech and writing. It is stated that there is a marked lymphocytosis in the cerebrospinal fluid and, in half of the cases, a positive blood Wassermann. Mentally there may be found rather typical symptoms of dementia præcox—a slow development of irritability, emotional deterioration, ideas of reference and persecution, hallucinations, mannerisms, and so on. Such types may occur early or late after infection, or may even be congenital.

The question of the etiology of dementia præcox in general necessitates a slight momentary digression from the subject at hand. Probably the majority of psychiatrists believe that at the basis of dementia præcox is the peculiar constitutional makeup. One speaks of the shut in personality, the irritable, suspicious, sensitive, diffident, and unsocial type of individual whose faulty reaction to environment and life in general constitute the outward manifestation of the psychosis. On the other hand, investigators are working along various lines and theories are being advanced from time to time, so that one often hears of the possibility of autointoxication, disorder of the internal secretions or glandular systems, congenital syphilis, and other organic conditions as etiological factors in dementia præcox. While it is true that præcox-like psychoses sometimes develop upon an undoubted syphilitic basis, as demonstrated by serological and post mortem findings, yet the constitutional element in typical dementia præcox is too selfevident to be disregarded, and furthermore, it must be admitted that it is possible to have a coincidental association of syphilis and dementia præcox. At the Connecticut Hospital for the Insane a considerable percentage of dementia præcox cases have positive blood Wassermann, the spinal fluid in every case, however, being negative. A conservative attitude upon the question of the relationship between lues and dementia præcox would seem to be proper at present, especially in view of the usually negative serological and autopsy findings.

A prognostic consideration of the psychiatric conditions associated with syphilis will result in a variety of conclusions. Although the newer treat-

ments, such as medication through the spinal canal or brain puncture, have been heralded by enthusiasts as means of effecting actual cures in general paralysis, yet the widely spread and deeply seated infection in genuine cases, as already shown, must preclude anything beyond a certain amount of arrest of further progress of the disease. At least some of the marvelous results of treatment reported may be accounted for by the occurrence of unusually marked remissions or by faulty diagnosis. Such a viewpoint, necessary and valuable as a general proposition, should not, however, prevent further and continued efforts to devise effective therapeutic measures in paresis. In the several forms of cerebral syphilis, on the other hand, the process being of more recent origin and more superficial, prompt and vigorous remedial measures should meet with decidedly favorable results. The same is true to a certain extent in the case of the so called syphilitic psychoses already mentioned.

In view of the importance of syphilis as an etiological factor in mental disease and the frequency with which this occurs, the necessity for preventing the spread of the infection should be apparent. There should be some means of insuring the thorough treatment of every case of syphilis. Although radical, there is probably no better way than by making syphilis a reportable disease, the patient being isolated and treated as a contagious case under the direction of the Board of Health until all danger has passed. Community, institutional, and other Wassermann surveys with prompt treatment of those indicated, cannot be conducted too frequently. Prostitution, so closely connected as the chief means whereby the infection is spread, is too broad and difficult a question for present discussion, but certainly regulation of some sort is necessary. Much may be accomplished in the way of prophylaxis by the enlightenment of the public. Fortunately one may speak more frankly than some years ago upon such subjects of concern to the general welfare. Although laws requiring certificates of health based upon Wassermann tests of the blood and other regulations as to marriage have so far seemed impracticable, yet by means of public lectures, instruction in the schools, and advice otherwise given, such a general sentiment should be created that those contemplating matrimony would be constrained to seek a clean bill of health. Every young person by the time the critical period is reached, should be informed as to the principles of hygiene, the dangers of promiscuous sexual activity, the virtue and possibility of continence, the menace of disease, and its far reaching consequences. That this is a difficult task and one to be intrusted only to selected and qualified instructors is acknowledged, but this should not deter nor excuse educational authorities from assuming the responsibility.

With the war preparations and the gathering together of hundreds of thousands of vigorous young men, the nation has assumed, to a degree hitherto unknown, the safeguarding of the general health and morals. Among the various propaganda for public welfare, no means available should be neglected in the effort to prevent the spread of venereal disease and its evil consequences.

THE INTRAARTERIAL (VERTEBRAL) ADMINISTRATION OF TETANUS ANTITOXIN.

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The *Bacillus tetani* is strictly anaerobic. It may, however, grow under aerobic conditions by symbiosis, other organisms using up the available oxygen. When both are encapsulated in scar tissue and oxygen is available, other organisms may, from one cause or another, be unable to multiply and so, not rendering the area anaerobic, prevent the growth of the *Bacillus tetani*. At a later period, through operation or attempts at breaking up adhesions, these hindrances are done away with and acute tetanus develops. This may account for the latent tetanus of which the war surgery has taught us to beware and to anticipate by prophylactic use of the serum. Tetanus is a toxemia. It is practically never a bacillemia. The *Bacillus tetani* is found only at the point of inoculation; it does not pass into the central nervous axis. Spores robbed of their toxin are quickly destroyed by phagocytes. The treatment of tetanus is therefore local, for the disposition of organisms at the site of the injury, and general, for rendering inert the toxic products of these organisms.

Toxin distribution.—"At the point of inoculation the toxin is sucked up largely by the motor nerves, in all probability by their bared axis cylinder endings from the lymph spaces, and is by this path transported to the motor ganglia of the cord." In the cord only a relatively few cells or segments may be involved, but general tetanic convulsions may ensue from radiating hypersusceptibility and hypertonicity, or the steady progression of the toxin up the motor nerve paths of the cord may take place until with medullary involvement death quickly follows.

Pathology.—Fairly regular changes in the motor ganglionic cells are found but none that can be considered pathognomonic or are not to be demonstrated in other infections. It is to be noted that recovered cases extremely rarely show subsequent palsies, clearing proving, in these cases at least, that the chemical combination occurring between toxin and cellular constituents is not an insoluble one, a totally destructive one, or one from which the cell health may not recover. The antithesis of this pathology is found in poliomyelitis wherein permanent injury to motor cells finds expression in permanent palsies in their trajectories. Furthermore, in fatal cases it is not unreasonable to believe, seeing that death occurs so quickly from cardiac failure, dehydration from profuse sweats, exhaustion, or asphyxia, that even in these, motor cell pathology may not have gone on to the extent of destruction.

From the standpoint of tetanus pathology the following points may therefore be considered in connection with treatment: 1. The local site of injury at which, and limited to which, are the *Bacilli tetani* growing and producing toxins. 2. A circulating hemolytic toxin, tetanolysin, absorbed from the site of injury by the way of the lymphatics which can

readily be neutralized by subcutaneous or the intravenous or intramuscular exhibition of antitetanic serum. This can be eliminated from the discussion of our present ineffectual methods of treatment. 3. A noncirculating toxin, tetanospasmin, gaining access to the anterior or motor ganglionic cells of the cord and the medulla, the central nervous system above the medulla being rarely involved, by means of axis cylinder processes of these cells, exhibiting definite election of motor to the complete exclusion of sensory cells; producing definite structural alterations in them without, however, of necessity causing their destruction, in truth the clinical picture of tetanus either acute or chronic, fatal or recovering, being incompatible with motor cell death and this toxin being inaccessible by our present methods of administering a neutralizing serum which we possess. 4. The distribution of a certain amount of toxin by the blood to the peripheral nerve endings, whence it finds its way to the cord by means of axis cylinders. Observations under 1 and 2 obtain here.

Antitoxin.—Antitoxin neutralizes the toxin in a test tube or when combined with the toxin in the presence of living tissues renders it inert. It is apparently harmless in very large doses. No serious ill effects are recorded following any of the different methods in use. Antitoxin, given subcutaneously, is absorbed very slowly. Notwithstanding this it has been extremely successful as a prophylactic in veterinary practice even in view of the marked susceptibility of the horse to the disease. Given intravenously it of course gains immediate access to the circulation but allows only a fractional portion of the dose to reach the cord owing to its large dilution and possible chemical changes in transit. It is excreted in a large part unchanged in the urine, feces, milk, and other excretions and secretions. An infinitesimal portion is to be found in the cerebrospinal fluid. In the intraspinal method the flow is quickly toward the cranial subarachnoid space and thence into the venous circulation. Very little effect can be expected upon the cord tissue by this means of injection unless the nerve tissue could be bathed in antitoxin laden fluid over a considerable period of time, which is obviously impossible in this disease when the technical care necessary in spinal anesthesia be remembered. The intracerebral and subarachnoid (cerebral) methods deserve no consideration. Quoting from Keen's *Surgery*, "The inability of the nervous tissue to take up antitoxin from the circulation is the most significant fact of all. It shows the futility of subarachnoid injections, it reminds us that subcutaneous or intravenous injections are only of value in so far as they can neutralize the toxin circulating in the blood, but cannot influence the process in the spinal cord, and it suggests the only rational method of administration, when combating the disease, namely, intraneural and intraspinal injections."

This statement that nerve tissue is unable to take up antitoxin is an unproved deduction from what follows upon our present method of injection. It does not take into consideration the large amount lost by excretion, the large amount going to other portions of the body, nor that which may be lost owing to exposure to

extensive oxidizing processes in the great pulmonary circulation, and the extreme dilution with which the remaining toxin must reach the cord and medulla, whereas meanwhile the toxin which is being elaborated is passing directly to those centres without any of these modifications or handicaps. Given as a prophylactic by these methods, however, it is efficient even after the hindrances to which they subject it. In the presence of the disease it fails in a large measure, and because it does so we attribute this to inability of the nerve tissue to take it up. The answer seems rather to be that we do not get sufficient quantity in contact with the toxin laden anterior cornual cells because either we fail to give sufficiently tremendous doses subcutaneously and intravenously to overcome wastage or we do not give fairly large doses in such a manner that the antitoxin will be brought rapidly and unchanged and only slightly diluted to the relief of these cells. The tendency during the war shows an imperfect recognition of these facts with consequent increase in dosage and with probably some lowering of mortality, which, however, is pitifully high.

Roger's method of injection directly into the cord seems to be an infantile attempt, although fundamentally correct, as far as intentions go, of what we can probably accomplish on a larger scale in another physiological way.

PROPOSED TREATMENT.

The proposed treatment includes, first, prophylaxis according to present accepted standards. In the presence of acute tetanus remove the source of supply of toxin by excision of tissue at the site of injury and carry out this procedure radically even to amputation. Block the flow of any toxin remaining by intraneural injection, not blindly, but under direct view of nerve, to prevent its access to cord. Intracaudal injections are uncertain and of doubtful value, very difficult to inject into nerve trunks, and worthless unless this is accomplished. Neutralize the toxin in blood by large subcutaneous or intravenous injections repeated daily or oftener. Use the customary therapeutic measures—chloral, bromide, morphine, amylnitrate, feeding, fluids, etc., as symptomatic treatment.

The toxin located in the motor cells of the cord and medulla remains to be neutralized. For this purpose it is suggested that a large dose or doses be given directly into one or both vertebral arteries by puncture of this vessel during exposure under general anesthesia, so soon as a diagnosis can be made. The reasons for this method are as follows: 1. Proteins—toxins, alkaloids—when injected intraarterially, become fixed in the cells in the capillary distribution of the artery employed. A good example of this is the immediate anesthesia produced in forearm and hand following injection of cocaine into brachial. 2. The vertebral arteries furnish a large proportion of the blood to the spinal cord and medulla through the long descending anterior and posterior spinal arteries which are given off near the medulla. The remaining blood supply comes from very small cervical branches of the vertebral and spinal branches of intercostal, lumbar, and sacral vessels. While there

is free anastomosis throughout the circle of Willis, it is yet a fact that cocaine injected into the common carotid produces anesthesia of head and neck without medullary involvement, which would lead us to believe that there is fairly sharp demarcation between vertebral and carotid distribution. As tetanus involves practically only the cord and medulla, the arterial blood of the vertebral will reach directly the attacked cells. Material injected into one vertebral reaches the entire distribution of both.

It is recommended, then, that under general anesthesia the vertebral artery be exposed as follows: Make a curved incision over the angle formed by the posterior border of the sternomastoid muscle and clavicle, and retract this muscle inward; it is often necessary to cut a few of the outer clavicular fibres of the sternomastoid. Incise the deep fascia; locate the carotid tubercle; displace inward the jugular vein; define the space between the inner border of the scalenus anticus and longes coli, and find the vertebral artery by its pulsation. The vertebral vein lies directly in front of it. Avoid the pleura, the inferior thyroid vessels, the phrenic and sympathetic nerves, and on the left side the thoracic duct.

Then pass the fine slightly curved needle of the loaded syringe into the vessel upward and inject a relatively large dose of antitoxin slowly. Any oozing from the vessel after withdrawal of needle can be controlled by packing the wound, which will allow of subsequent injection if necessary. If these later injections are indicated, but it is found from any cause to be impossible to give them into this vertebral artery, then the opposite one should be exposed. The wounds may be closed at any later time. This procedure is not technically too difficult to be practicable, is certainly no more formidable than trephining and injecting into the brain and under any circumstances is justified in the present hopelessness of the great majority of cases.

This method of intraarterial (vertebral) administration of antitoxin fulfills the theoretical pathologicophysiological requirements of reaching the heretofore inaccessible toxin in the cord and medulla. The antitoxin, arriving at the anterior cornual cells only slightly diluted, being subjected to a minimum possibility of alteration in the blood stream, evading the pulmonary circuit, reaches as intimately the involved cells as does the toxin; allows of the use of almost the entire amount injected for the purpose indicated through the fortunate limitation of the vertebral circulation to the parts involved; is not too technical to be feasible, and so far as can be determined by analogy should be as safe as any other of the methods in vogue.

The first application of this method was made by Major Charles F. Nassau, M. R. C., at Frankford Hospital, Philadelphia, on February 6, 1918. He exposed the right vertebral and gave 15,000 units—fifteen c. c. concentrated—of antitoxin intraarterially in an acute case of tetanus.

NOTE.—Sir David Bruce, Surgeon General in the British Army service, published statistics showing the great decline in tetany, though he regards the evidence as to the therapeutic effect of antitoxin serum as yet inconclusive.

SEX IN LIFE.

The Relation of Sex Education to Mental Hygiene.

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(Concluded from page 692.)

Now the youth becomes eager to know the nature and effect of sexual activity, and he or she wants to know what sanctions there are for responding to the impulse towards it. The pamphlets meet this situation with the statement that the sex instinct is "the desire to create new life," and the youth is merely told that sexual love between a couple means the wish to serve each other and to serve the world by giving it "strong noble children." He is further informed that adolescence is a period of training the mind and body for this purpose, and that the new demands must not frighten him, but difficulties be conquered proudly in view of greater reward for his services in later life. The adolescent youth observes that the social activities that he is ushered into, and which appear in so many ways to be introductory activities to marriage arrangements, seem totally unconcerned with babies. In fact he will find, for instance, that if he is naive enough to try and estimate the social value of an unmarried girl by openly considering how fine a baby she might become the mother of, he would be doing a highly improper thing. On the other hand, he is able to observe that there are numerous respectable married couples who have lived together, in some unaccountable way, for many years, and have had few or no children. Again, he will frequently discover other couples, struggling along unhonored, often in poverty and squalor, burdened under the care of numerous young ones. And perhaps he may come to know of the outcast unmarried mother and her unwelcome child.

Thus the youth is again confronted with a discrepancy between what he is taught, and what he is able to observe. Reproductive prowess, as such, is not yet admitted to form the proper basis for polite social intercourse. He finds, in reality, that sexual emphasis in social life is placed, not upon babies and the preservation of the species, but upon the biological qualities that make individuals of one sex necessary in the lives of individuals of the opposite sex. In vain does he await the appearance, in the program of his social world, of the manifestations of the desire for parenthood which, he is told, is born in each of us.

The youth is told that what the world most needs is "fine men and women" developed from "strong noble children;" that this, "the creation of life" is "the world's great purpose;" and that he must keep himself physically sound to serve this purpose. Thus it is indirectly suggested to the youth that there is a relation between a sound constitution and well born children. He is again reminded that he does not live for himself but that, as far as he has any sex, he is principally an instrument to further the world's great purpose. But he does not find, in actual life, that the creation of children

is the usual method of attaining the great purpose of the world.

The pamphlet tells him about the morphological changes of puberty, brought about through the internal secretion of the sex glands, but nothing is said about the functional influences of this secretion during adolescence and later life, except the reference to menstruation and nocturnal emissions. The functional influence of the internal secretion on the general constitution and temperament, and the influence of sexual activity on the internal secretion, is not referred to. In other words, the influence of sexual activity on health is not referred to except for the dogmatic assertion that it is not necessary to health.

With puberty normally comes the initiation of the youth into social activity proper, with all the readjustments it demands. The phenomena of childhood show us no reason for the sexual organs and functions being treated apart from other organs and functions. All life in this period is, in large degree, physical and vegetative. The hygiene of adolescence should seek to preserve this continuity in the social phase, and avoid antithesis and conflict between sexual activity and social life in general. The pamphlets make practically no reference to the relation between these two things. They seem to make health during adolescence depend principally upon personal hygiene of the physical individual.

It is true that "these demands" of the adolescent's sexual development for proper bodily hygiene are "simple every day matters," but it is too much to say that "if you fulfill these demands you will be spared much of the nervousness" which so often appears at puberty. The authors are apparently adherents of the defunct reflex theory of "nervousness." But the "nervousness" showing itself at puberty is alas, frequently of far more deep seated origin. The symptoms—depression, irritability, etc.—which the authors describe as occurring in boys and girls at this time of life are often indications of profound trouble that cannot be avoided by mere attention to bowels, sleep, cleanliness, diet, and clothing, and that cannot be attributed, upon any such basis, to the fault of the sufferer. Corresponding to the difference which the pamphlets seem to set up between the sex organs and the other parts of the body, it appears an attempt is made to establish a difference, in essential nature, between human and animal sexuality. This, however, is a common feature of ordinary sex hygiene literature. It is merely another way of placing sexuality in antithesis to the rest of life. It is only another form of duality: for in part of the argument it is taught how the nature of sexuality is the same in animals and human beings, and in the other part how it is different.

Comparative sexuality is generally made the basis of instruction in the physiology of sex. Animal life is necessarily used to introduce and illustrate sex life to the child. Essentially reproductive processes are emphasized. Much is made of the organic and vegetative aspects of genesis; but the corresponding constitutional aspects, which provide grounds for deductions just as important for the

youth, are ignored. Practically nothing is taught to him regarding the constitutional sexual phenomena the individual animal exhibits. This is all passed over, as if it did not exist. Yet the phenomena of rutting, and sexual selection, for instance, and the subduing, spirit killing effects of castration, are just as proper features of sexual life as are the various forms of fertilization, and gestation, and care of the young.

What is the importance of this constitutional aspect of sexuality to the youth? Why is he not taught about it? Is it because it suggests a corresponding constitutional aspect in human sexuality? Is it because it demonstrates that the alleged difference in nature between human and animal sexuality is an artificial distinction? By constitutional sexual features are meant principally the phenomena described by Havelock Ellis as "tumescence" and "detumescence," and the biological processes underlying them. The significance of these features of sexuality is best brought out in the words of Ellis himself. Speaking of the phenomena connected with tumescence he says: "Those phenomena constitute the most prolonged, the most important, and the most significant stage of the sexual process. It is during tumescence that the whole psychology of the sexual impulse is built up; it is as an incident arising during tumescence and influencing its course that we must probably regard nearly every sexual aberration."

To assert that there is an essential difference in nature between human and animal sexuality is only another way of saying that there is an essential difference between the aspect of life we call species and the aspect we call sexuality. It is the same as declaring that, while there is a genetic relationship between the various animal species, including the human species, there is no necessary genetic relationship between the manifestations of sexuality of the various forms of life. This, it is needless to say, is only another way of accentuating sexuality, and making it an exceptional biological feature at the expense of the conception of species taken as a whole. And when we make a special feature of sexuality we dualize it.

Consistent with an antithesis between human and animal sexuality, and between sexuality and species, the pamphlets proceed to teach that animals are led, in their sexual lives, by "instinct," and human beings by voluntary choice and "love." To place instinct in apposition to this intellectualized love, and to allow it to be controlled by "will," it is taken out of its native proper setting in the biological scheme of things, and forced into the category of reflex phenomena. In this way instinct is made to appear as a subordinate form of reflex activity, presided over by the highest form in the reflex series, namely, voluntary action. It is thus suggested that, while the sexual instinct or impulse arises locally from some part or organ within the organism, volitional sexual activity goes beyond, and has its cause and aim external to the organism in the world at large. Instinctive activity, as thus conceived, belongs to the same class of activity as emptying a full bladder, or scratching an itchy spot. The sexual impulse is, in this way, held to be a reflex phenomenon arising

locally or peripherally from the genitals, to be controlled by external influences through the will.

This reflex theory of the origin of instinct is, of course, an integral part of the general teleological mould, into which the authors cast the material of their pamphlets. It is intended to show the youth that the sexual impulse has its origin and exciting cause locally in the body, and hence, by extension, outside the body in the material world governed by "will"; and that, therefore, it has its aim and purpose outside the individual. He is taught that "both animals and human beings exist to serve a great purpose," and that the great purpose of life is "the creation of life" and the production of "fine noble children." In other words, sexuality is a thing apart from the life of the individual: it exists for some purpose, not within the individual himself, but outside the individual in the external world.

Instinct is not a reflex phenomenon. It has not its source outside the individual. It is an expression of the organism's inner nature. It has its foundation in the biological constitution of the living being. It is a manifestation of the organized phylogenic history of the race, a motivating influence welling up into the individual's life with all the force of the phyletic past. It indicates the specific direction in which the development of the life of the species is taking place. Its manifestations are as typical of the species as the morphological features which characterize the species. It is no more a product of local, external, or present forces, than the organism is a thing created and animated by such forces. Instinct comes with us from the source of life itself, a proven creation of untold centuries of struggle for existence.

The outer features of structure and activity, which distinguish one species from another, and one sex from the other, have an inner basis in an inherited system of biochemical affinities and tissue organization, known as the constitution. This specifically organized biological system manifests vital phenomena that are not usually embraced within the limited scope of the elementary human physiology which affords the foundation for so much sex hygiene doctrine. For example, differences in internal organization between different species, and the two sexes, are shown in their differences in susceptibility to the influences of drugs, and in differences in immunity to infectious diseases. Women are much more prone to certain disorders of the glands of internal secretion than are men. Constitutional differences between species are also shown in the phenomena of precipitin reactions, and anaphylaxis. And one of the most striking and significant of the phenomena in this category is the fact of the sterility of any sexual relationship between members of different species.

Nature has not only provided this external antagonism between the organizations of different species, as a result of which they are kept discrete and prevented from merging into each other, and more generic forms, but also an internal affinity between members of the same species, which preserves and intensifies the specific aspects of organization. And so, upon the basis of complementary or identical features of biological constitution, a system of

relationships is exhibited exclusively between members of the same species. These relationships never extend beyond the species proper, although within the species some of them may be restricted to more differentiated racial or social groups. These relationships we know as social and sexual relationships. The forms which they take are specific for each biologically homologous group of animals. The social and sexual activity of the individual is an expression of the fundamental nature of the species to which he belongs.

Sex is the means by which the biological integrity of the species is kept strong and the strain pure. It counteracts the element of dissolution that is inherent in simple reproduction. In the asexual forms of life we see reproductiveness at its height, and organization poorly developed and lacking coherence. The individual organism is readily split into opposing parts, which live independent of each other. Reproduction shows itself to be the fundamental biological reaction to the most compelling influence of the external world—the menace of death. As long as the organism is thus so much at the mercy of influences external and alien to itself, little evolutionary progress is made towards higher and more specific organization, and individuality. A means must develop to limit the power of the external world to cause reproduction. Reproductiveness must be decreased, and made to depend upon some element peculiar to the organism's own nature. This element, which limits the forces of disorganization, and hence provides the conditions for integration, is found within the circle of the species itself. It is sexuality.

The immediate object of a sex hygiene pamphlet for adolescents is now clear: It is to orientate the youth regarding the relation between social and sexual life, and to show him how it is all a function of his constitution. Sex hygiene is social hygiene, and both, in last analysis, are hygiene of the constitution. The sexual constitution is an inseparable part of the general constitution. When adolescent sexuality is touched, the whole adolescent social life is touched. Both have their springs in the same biological base. It is in reference to this base that the youth must be approached.

No sex hygiene pamphlet for the youth, which fails to correlate sexuality and personal social activity, can be said to have dealt satisfactorily with the problem of adolescence. For the main problem of this period of life is sex in its social aspect. With this we are no longer dealing merely with the physiology of a special organ, or group of organs. The sexual activities of adolescence, and later life, are no more the mere expression of the function of a special or isolated organ than the social activities are an expression of the function of a special organ. In fact, both classes of activity are expressions of a biological system that is phylogenetically much older and more fundamental than any one organ or group of organs. Both classes of activity are expressions of constitutional needs. The sexual activity of adolescence must be estimated, not in mere physiological terms, but in terms of the bionomic relation of one individual to another.

The adolescent's greatest solicitude is in regard

to the impression and effect he produces in others, especially others of the opposite sex. His foremost desire and purpose is to be a representative member of his species and sex. Social life is essentially a form of activity that has the effect of testing out the individual in this respect. The adolescent's social prestige depends upon how typical he or she can be—how human, and how masculine or feminine. He finds that the traditions of his race and sex require him to exhibit, in more or less conventionalized form, the very things that he finds his instincts are prompting him to exhibit. He ignores or resists or fails in these things at the expense of being considered queer or abnormal, and of finding himself, in one way or another, socially isolated. The individual's attitude towards common and typical features of human social life—dress and fashion, the use of tobacco and alcoholic beverages, dining, dancing, laughter and its provocatives, sports, games, and amusements, and social ceremonies—is considered as much an index of his biological makeup as the grosser and less common evidences of pathological constitution, such as morphinism, sexual perversion, or epilepsy. Not only do many of these features serve to distinguish human beings from other animal species, but devotion to some of them, in varying degree, according to conventionality, is considered characteristic of manliness and of womanliness. These features of social life are often preliminaries and accessories and approximations to, or even vicarious equivalents of actual sexual experience. The sex hygienist, whose doctrines consist mainly of physics and ethics, will miss the significance of this.

Appetites, tastes, propensities, habits, manners, interests, sympathies, and antipathies in large degree become typical of one or the other sex and are either secondary sexual characteristics, or, being manifested in common by both sexes, afford a common basis for social intercourse between them, and between members of the same sex. The same principles of hygiene apply to sexuality as apply to these features. Anomalies of attitude towards the fundamental features of social life are generally found associated with anomalies of sexual nature. The adolescent becomes just as sensitive and solicitous regarding his sexual standing and ability, as he does about his good birth and breeding, his ability to gain a living, his courage, or his popularity, and he is strongly inclined to have it proven and confirmed. This inclination is instinctive, and the feeling of fitness and wholeness and self-confidence that follows complete sexual experience is nothing less than a reflexion of its stimulating and integrative effect upon the whole constitution.

The adolescent seeks, not mere physiological health, but biological health. No hygienic argument, couched in the terms of anatomy and physiology, will appeal to the instincts involved, or have the desired modifying influence on their manifestations. How futile, for example, have been all such arguments against corset wearing.

The sexual impulse, and the social tendencies, are expressions of a genetic evolutionary organizing activity running through life. They are not expressions of mere mechanisms. Their source of motivation is internal, not external, just as the

developmental phenomena of a plant or animal arises internally, and they are not naturally subject to any external and improvised system of living. It is the whole phyletic past, not the mere present scheme of things, that is expressing itself in the adolescent's sexual impulse. How can we deal with it properly if we look upon the human organism as a reflex biological machine, controlled and directed by "mind and will"?

Although protesting here and there to keeping sex and life intact, the pamphlets seem committed throughout to a dualistic conception of life. The alleged difference between sex in body and sex in mind is emphasized so far as to make each of these two phases the subject of a separate pamphlet. This is quite consistent with the authors' declaration of belief "that the teaching of sex from the biological standpoint alone is totally inadequate and that there is little basis for character forming or ethical instruction in the physical analogies of animal life." It is regrettable that such a belief should be considered proper basis for a sex hygiene pamphlet. We know of none but a biological basis for character and morals. Life bears its directive principle within itself. It cannot be subordinated to an external scheme of things, either physical or metaphysical, without losing its unity and natural tone. To deal with sexuality as a thing apart from the total biological individual, and treat it as something existing entirely for an external purpose, is to prepare the ground for the disruption and degradation of individuality itself. It is a strange hygiene that fosters such a process.

The profound rearrangement that occurs in the whole organism in adolescence is shown in no more striking way than in its changing psychic phenomena. Nothing is more delicate at this period than the mentality. The psychic phenomena are but expressions, in subjective terms, of the changes that are stirring the whole individual. Life in its ultimate synthesis is psychic. The psyche, conscious and subconscious, in a way, is the whole individual. It is the medium into which the entire life of the individual finally becomes translated.

Adolescence, therefore, is the critical time for mental health. Now it is when fundamental attitudes of mind, and the corresponding biological makeup, begin to assume their final form and their most effective, and most threatening or promising potentiality for the whole future of the youth. Now is the time, therefore, when unity should be sought, when contradictory and dissociating influences should be avoided, when all the organism should have a single guiding principle. Hence the great potency for good or evil of sexual teaching and training in adolescence. A doctrine and discipline that fosters sexual dualism threatens the entire life of the youth with internal dissension.

Biological conflict in the individual's life and mind may not only lead to corresponding disintegrative processes in the constitution, to be transmitted to the next generation in the form of constitutional weakness, but in the individual himself it may even bring about such a state of incompatibility, that a splitting, or even fragmentation of personality results, with an alienation of the individual from the world, and with this, insanity.

This failure of adjustment too often expresses itself in the form of dementia præcox, the "insanity of adolescence," the victims of which compose one fifth of the number of patients admitted to our insane hospitals, and three fifths of the number who remain in these institutions, making it actually proper to call these places dementia præcox hospitals. The individuals who later develop this mental disease at first show a characteristic faulty attitude of mind towards life, which is of the utmost educational significance. The disease, in its developed stages, gives us the completed picture of a frustrated adolescence. The patient's mind is preoccupied with a fantastically disguised inner sexual conflict, and the accompanying disorganization of his constitution is shown, among other ways, in the perverted internal secretion of his sex glands.

The natural tendency of the mind, appearing at adolescence, to become concerned with the problem of one's relation to the world and life, can often be exaggerated into morbid introspection and self-analysis when obstacles are placed in the way of the youth performing what an eminent psychiatrist has termed one's "biological duties." The adolescent has a specific biological program to complete, an inherited, endogenous paradigm to fill out and maintain filled. The constitutional changes that take place within him at puberty cause him to become psychically sensitized in such a way that he is enabled, more or less clearly, to see his experiences in their biological setting. Lack of means to give expression to his inner nature may come to mean the same to him as, for example, a lack of morphological features that distinguish his sex or species. This can result, as we see in the psychogenic mechanism of dementia præcox, in the predisposed youth becoming critically absorbed in himself.

Little consideration of the subjective aspect of sexuality is given in the ordinary sex hygiene teachings. In this respect, also, the pamphlets under consideration are no different from others of their kind. Sex life, it is taught, derives its value and its compensation from the results it produces in the world outside the individual. Sexuality must submit to an external and objective standard of valuation. The individual's inner life seems to be of comparatively little importance, as long as external conditions are satisfied. The internal psychobiological states, that correspond to the outer concrete manifestations of sex, are largely ignored. And these external sexual manifestations are suppressed or reduced or distorted according as it is deemed expedient. Yet the inner nature of the individual, when frustrated, can often become as troublesome and destructive an influence to the individual as the external world becomes when its conditions are not satisfied. There is no real gain, ultimately, in keeping external conflict suppressed by translating it into an internal state, and making the inner life of the individual, conscious or subconscious, a field of conflict. It is not only opposed to our best moral instincts, and one of the principal modes of falsification of life, but, as we see, it can even threaten sanity itself.

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THE PUPILLARY REACTION IN CHRONIC ALCOHOLISM AND ALCOHOLIC PSYCHOSES.*

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In consulting the literature for some time past on the pupillary reaction in chronic alcoholism and alcoholic psychoses I have found that scarcely any reference is made to this physical sign except in acute alcoholic states. For the past year at the Kings County Hospital we have watched this reaction very carefully and have checked up our diagnoses and classification by means of careful anamneses from the relatives, by the Wassermann reaction on the blood and spinal fluid, and by the gold chloride reaction and the cell count in the spinal fluid. There is therefore no doubt about the etiological factor in any of the cases cited. We were dubious that the pupillary reaction really was impaired, feeling that a toxic substance of the nature of alcohol was insufficient in itself, without the presence of an organic condition, to produce any decided change in the pupillary response to light.

Theoretically, sluggish reaction and loss of pupillary reaction to light may appear in every disease that interrupts the reflex tract to any point. Practically this is the case only in relatively few well characterized diseases of the central nervous system of which the so called meningo-syphilitic diseases, tabes, general paresis, meningitis, and brain tumor may be taken as the most frequent. Our observations, however, have shown that in some cases of chronic alcoholism and the various types of alcoholic psychoses there is temporarily a definite absence, sluggishness, or limitation of reaction. The pupils are often widely dilated and then show an absence of light reaction; again the pupils may be moderately dilated but with a definite limitation of range and sluggishness of reaction. In all of the cases, however, after the first two or three days the pupillary reaction was found to be of normal character.

To review briefly what is known anatomically of the motor side of the pupillary reaction, it was considered until recently that the motor nucleus for the pupil was located in the nucleus of the third nerve and in a special part of it near its anterior end in the so called Edinger-Westphal nuclei, situated close to the middle line, one on each side, consisting of small nerve cells embedded amongst the larger cells of the oculomotor nucleus. To explain the occurrence of loss of the light reflex various theoretical lesions were assumed, sometimes in these Edinger-Westphal nuclei, according to Bernheimer, cited by Stewart (1), sometimes in Meynert's fibres leading from the anterior corpora quadrigemina to the supposed pupillary centre in the nucleus of the third nerve. Against the first of these theories, cases have been reported of tumor of the midbrain completely destroying the oculomotor nuclei and so producing ophthalmoplegia externa and yet the pupillary reflex remained, ac-

cording to Biancone, Jacobson cited by Stewart. Furthermore, total ophthalmoplegia, internal and external, has occurred without any affection of the Edinger-Westphal nuclei (Monakow). Again, degeneration of Meynert's fibres has not been demonstrated even in cases of tabes or general paresis where loss of the pupillary light reflex is one of the commonest and most important of the clinical manifestations. Lastly, experimental and clinical evidence (Piltz and Bach) has shown that the ciliary ganglion is the principal motor nucleus controlling the sphincter pupillae, and Marina in a series of twenty-eight cases of tabes and general paresis showing the Argyll-Robertson pupil, found this ganglion invariably degenerated. In one of them where the Argyll-Robertson sign was confined to one eye, the ciliary ganglion was degenerated on that side alone, the ganglion of the other side being normal. It is therefore probable that degeneration renders the ciliary ganglion inexcitable to the stimulus of light, whereas it can still respond to accommodation, the stimulus being transmitted along the course of the third nerve. The connection between the anterior corpus quadrigeminum and the third nerve is by the way of the posterior longitudinal fasciculus.

I am not in a position to explain this temporary loss or limitation or pupillary reaction which we have observed in the alcoholic group (2). I have consulted numerous authorities as to the effect and mode of production but in no instance was I able to find any reference to the effect of alcohol on the pupil, and evidently this phenomenon has not been studied in experimental work with alcohol. In acute alcoholism the pupils are equally and widely dilated and the pupillary reaction to light is either very sluggish or lost entirely while the intoxication is at its deepest (3). In alcoholic coma the pupils are dilated and react sluggishly or not at all to light (4). In the so called wet brain which usually follows delirium tremens but may develop in any chronic alcoholic after a debauch, the pupils are usually diminished in size and react sluggishly to light (5).

In this study thirty-seven cases of chronic alcoholism were selected in twenty of which the pupillary reaction was normal, in sixteen sluggish and the pupillary range limited, and in one the pupillary reaction was absent. Sixteen cases of delirium tremens were included, in three of which the pupillary reaction was normal, in nine sluggish and limited, and in four absent. Twenty cases of acute hallucinosis were included, eleven of which showed a normal pupillary reaction, five sluggish and limited, absent in four. Ten cases of Korsakow's disease were included, in one of which the pupils reacted normally, sluggish and limited in five, and absent in four. Two cases of alcoholic confused state were included, in one of which the pupillary reaction was normal and in the other limited. Two cases of pathological intoxication were included in both of which the pupillary reaction was normal. I might add that in none of the cases cited were there any evidences of acute alcoholism but all presented the general physical symptom complex of chronic alcoholism.

We have then eighty-seven cases, in thirty-eight

*Read before the Brooklyn Neurological Society, November 7, 1917.

of which the pupillary reaction was normal, in thirty-six sluggish and limited, and in thirteen absent. These findings we believe are both interesting and important because one so frequently associates the diagnosis of paresis and tabes with a sluggish or absent pupillary reflex; also because alcoholics and persons with alcoholic psychoses present other symptoms, such as a thick, indistinct, slurring speech, particularly in delirium tremens, coarse tremors of the tongue, hands, and facial muscles on the physical side, and on the mental side confused states with defects of memory and orientation. In view of our findings we wish to impress upon all psychiatrists and neurologists the importance of Wassermann reactions on the blood and spinal fluid and also the gold chloride reaction on the spinal fluid as offering a still further means of correct differentiation.

I wish to take this opportunity of thanking my assistants, Dr. M. Mortimer Sherman and Dr. Bertram P. Brown, for their aid and interest in working up these cases.

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KINGS COUNTY HOSPITAL.

HOARSENESS.

Especially as Affecting Singers.

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The most important problem confronting the laryngologist is hoarseness, especially that in singers, speakers and those who depend for a livelihood solely upon the use of their voice. It is important before examining the patient to take a careful history of the case. It is essential to know the habits of the individual, his customary diet, etc.

Before examining my patient, if he is a singer, I test the voice with a few scales so that I may become acquainted with his method of intonation, attack, etc. If I find a faulty method, that puts me on the right road. After testing voice, I next examine the nose and throat for any pathological condition which may cause hoarseness. Do not direct all the attention exclusively to the vocal cords, but search carefully the surrounding tissues. Any pathological condition interfering with the action of the vocal cords will cause hoarseness, but other things will produce the same effect. Marked hypertrophy of the lingual tonsil will cause a constant irritation, setting up severe congestion of the mucous membrane around the laryngeal region. Caseous tonsils have the same effect. Enlarged and inflamed adenoids and chronic nasopharyngitis has been proved to cause hoarseness. Great meat eaters will always have a severe congestion of the mucous membrane of the nose and throat, probably due to the increased proteins in their blood.

The most important problem is the hoarseness which comes on without apparent cause and without history of exposure on the part of the singer. It

will frequently disappear almost as suddenly as it came. The patient fears to sing a long aria; he dreads that his voice may break during the course of his delivery of it. On examination invariably you will find in these patients a small nodule on one or both cords. This condition is known as chondritis nodosa. Chondritis nodosa accompanies chronic laryngitis in those who use their voices in a faulty manner. It is more frequently found in women. It occurs in singers and public speakers and in others whose occupation demands the use of the voice for long periods of time. Singers with this condition will always complain of difficulty in striking the right note and holding it when obtained; their voices crack in the midst of singing or talking. Change of climate has also caused hoarseness but this effect wears off gradually.

CASE I.—*Climatic cause.* Sig. G. M., opera singer, came from Milan, Italy, and upon arrival could not sing *messa di voce*. Examination was negative, and the patient retained control of voice when summer came.

CASE II.—*Faulty method.* Mrs. W., a vocal student, complained of hoarseness after exercising. Examination showed enlarged adenoids. These were removed, but the harsh tone of the voice still persisted. I advised a change of instructors, and with a different teacher the hoarseness disappeared.

CASE III.—Mrs. G., a public speaker, complained that her voice was harsh and hoarse and cracked easily. Examination showed a node on the middle third of the left cord. Rest and application of silver nitrate, one per cent., twice a week, produced marked improvement.

CASE IV.—Mr. A. T., a singer, was hoarse only when speaking. Examination showed hypertrophied tonsils and adenoids. Operation eradicated condition.

CASE V.—Miss E. R., a vocal student, had hoarseness in the morning. Examination showed deep caseous tonsils. Operation improved the condition.

CASE VI.—Mr. W. V., a vocal student, was fond of meat, which he had twice and sometimes three times a day; he also ate a good deal of pastry. On examination turbinates were found hypertrophied and congested; the throat was congested; urine showed increase of urates and a trace of albumin. Adjustment of his diet cleared up the condition.

CASE VII.—Miss L. L., a school teacher, had difficulty in speaking and her voice was harsh. Examination showed chronic nasopharyngitis. Application of two per cent. silver nitrate helped to clear up the difficulty in the voice.

The treatment depends upon the cause. If the method is faulty have the singer change instructors; if due to diet prescribe a different one; if due to any pathological condition treat it accordingly. Diet, rest, relaxation, plenty of air, exercise, and regular habits will gradually eradicate the hoarseness which is the dread of the singer and the public speaker.

1425 MADISON AVENUE.

Intraspinal Arsenical Treatment of Syphilis.
—Beverly R. Tucker (*Texas Medical Journal*, February, 1918) concludes that intraspinal salvarsan can be administered without danger provided small doses are given and perfect asepsis used; each individual case should be treated until the Wassermann is negative and the globulin and cell count normal; frequent examinations of the spinal fluid should be done after an apparent cure and treatment again instituted if necessary, as shown by the Wassermann cell count and globulin estimation; intravenous salvarsan in many cases effects a great clinical improvement and sometimes eradicates the biological evidence of active syphilis.

Medicine and Surgery in the Army and Navy

PRINCIPLES OF TREATMENT OF GUNSHOT WOUNDS AT CASUALTY CLEARING STATIONS.

By H. M. W. GRAY, C. B.,

Aberdeen, Scotland,

Temporary Colonel, A. M. S.; Consultant Surgeon, British
Expeditionary Force.

(Concluded from page 699.)

Removal of foreign bodies.—Whether foreign bodies should be removed depends first on their size, shape, character, and position of the entrance wound, all of which determine the amount of infective material carried in; and second, on the mobility of the part in which they are lodged and the probable effect on its function. The more important the function the greater is the necessity for early removal. The amount of infection carried into a wound depends chiefly on the shape and roughness of the missile, and whether it has traversed the patient's clothing. An undistorted rifle bullet carries in a negligible quantity, with which the tissues usually deal successfully. Shrapnel balls, distorted rifle bullets, and fragments of shell practically always carry in sufficient to cause inflammation. Shrapnel balls and fairly smooth pieces of shell may be quickly wiped so clean during transit through the tissues that they do not cause infection where they lodge. It may quite often be observed that while sepsis becomes established around the entrance wound, the deeper parts of the track remain or become sterile, and no inflammation occurs around the missile itself, so that it can often be removed aseptically through a fresh incision.

All are agreed that irregular fragments of shell, distorted rifle bullets, and superficial shrapnel bullets should be removed as soon as possible. Difference of opinion exists concerning the necessity for and proper time of removal of undistorted rifle bullets or shrapnel balls or small pieces of shell which are not causing trouble or which are difficult to reach. The decision should really be governed by the importance of the structures in or near which they are imbedded, and the amount of movement which ordinarily takes place. Thus, if buried in bone, in the condyles of the femur, for instance, a rifle bullet, almost always, and a shrapnel bullet, frequently, heal in, and may remain permanently without causing irritation. If in the belly of an important muscle any foreign body, unless comparatively minute, will sooner or later have to be removed. It is dangerous to leave any kind of foreign body in close proximity to a large pulsating vessel. Ultimately it will cause secondary hemorrhage or aneurysm. The more irregular it is in shape the sooner will trouble occur.

The structures forming a joint lie, ordinarily, in such close apposition during movement that there is no room for any extraneous material. While an aseptic foreign body, lying free in a joint, may cause no irritation so long as the joint is kept at rest, very rarely can the joint be moved to any extent without lighting up trouble, so that the removal as early as possible is indicated. Much more is this the case when sepsis is present. It is remarkable

and somewhat inexplicable that in some quarters it is apparently the practice to treat the brain—possibly of all organs the most important, the most delicate, and the most susceptible to continued irritation—on a different principle. I need only say that it seems very unjust to the patient that his brain should be selected as an exception to a principle whose application is attended with such success in other parts of the body. If suppuration occurs around a foreign body, common sense dictates its removal whatever be its character.

X rays.—The importance of accurate localization has been borne in on us all in various ways from time to time. When a special localizer or stereoscopic apparatus is not available the part should always, be skiagraphed in two planes, preferably at right angles to each other.

Antitetanic serum.—No matter how insignificant the wound, every patient should receive a prophylactic dose of antitetanic serum. If doubt exists as to whether a dose has been given at the front, the surgeon had better make certain by giving one. The fear of anaphylaxis is an insufficient excuse for not giving the serum, but in the case of a man wounded for the second or third time it is probably safer to give it in fractional doses, especially if he reports having shown any of the manifestations of serum sickness after previous injections.

Preparation and selection of cases for operation.—The preparation of cases for operation forms an important part of the work of the Casualty Clearing Station, and is gradually becoming more elaborate and attended with increasing good results. The resuscitation wards furnish striking examples of veritable resurrection. It would be superfluous to describe methods employed in combating shock. The work of American medical officers has been excellent and most helpful in this department. It is unnecessary to dwell here upon the cases which should be selected for immediate operation. In various articles on wounds of different regions of the body an attempt has been made to indicate this.

Rate of development of infection. Necessity for early, preinflammatory operation. Before proceeding to a description of the different types of wounds and their technical treatment one may be permitted to draw attention again to the alarming rapidity with which infection often develops in war wounds in France. It has too often been the experience that men have succumbed to acute gas infection within twelve hours of the reception of their wounds. In a very large number it is quite evident within twenty-four to forty-eight hours. Acute septicemia is frequently present inside the same period, and when streptococcal in nature is particularly fatal. The patient, if any hope exists for his recovery, must be got into a condition fit for operation with the least possible delay.

The rate of development of infection depends largely on, the amount and virulence of infection; the extent of the injury and the laceration of affected tissues; and the integrity of the blood supply, which is affected by injury or other mechanical causes, shock, hemorrhage, etc. The amount can

be roughly estimated at an early stage by the size and character of the foreign bodies and extent of the general soiling of the wound; immediately after the injury the virulence cannot be estimated.

TYPES OF WOUNDS.

The types of wound are so manifold that any classification is difficult, but they may be placed in three groups, to provide headings for the discussion of technical treatment.

1. *Simple perforating wounds in which the track is of about the same diameter as the skin aperture.* An example of this group is the wound caused by a bullet traversing at long range the soft tissues of a limb. Entry and exit are small, and the damage to muscle is slight. The majority of these wounds require no operative treatment or, at most, excision of skin and fascia. Depending probably on the state of the muscle as regards contraction at the moment of impact, small entry and exit wounds are sometimes accompanied by great destruction of muscle; such cases belong to group 3.

Wounds caused by shrapnel balls have certain peculiar features. Here a smooth spherical projectile of low velocity, having penetrated the skin, finds a passage through the muscles, often without causing much surrounding disturbance, but its velocity is so low that it is very frequently held up in meeting a tissue of greater resistance. Indeed, it is remarkable how often shrapnel balls are found lodged beneath the skin after having perforated the body or a limb. If the ball and other foreign material are removed, and the entry wound excised, the track does not often cause trouble, although one would think that the wad of clothing carried in ahead of the ball would give rise to serious infection.

2. *Wounds in which the destruction of skin and superficial tissues is of greater extent than the destruction of deeper tissues.* In such wounds as these—gutter wounds, explosive exits, superficial lacerations, avulsions—the wound is more or less exteriorized, and what is required is the excision of all damaged tissues, in order to attain the ideal of an open wound with a living uninfected surface. If this can be assured, the new wound may be closed by primary suture, but unless one can be absolutely certain that the whole of the original wound surface and the underlying “shocked” tissues have been removed without infecting the new wound, failure is likely to occur. In such cases paraffin pastes are probably useful in ensuring primary union.

3. *Wounds in which the skin aperture is small in relation to the extent of damage inflicted on deeper structures.* Such wounds may be divided into lodging wounds and traversing wounds. This group includes the majority of wounds; and, apart from injury to important structures, these are the wounds that most urgently call for surgical treatment.

TECHNIC.

1. *Sterilization of skin.* Hairy parts should be shaved. Wash the skin surrounding the wound. If it is heavily caked with mud, the use of a scrubbing brush is advisable, but in most cases this may be omitted. In a limb the whole circumference should be cleansed. During this process the surface of the

wound should be covered with an absorbent swab, so that its discharge may not escape and soil the skin. With a pair of forceps pack the wound with gauze dipped in picric acid solution three per cent. in methylated spirit is very widely used—or with the more deeply staining solutions described under traversing shell wounds (6).

In the case of a wound of group 3, one should previously ascertain the direction of the track, with the finger, if possible, a search that is often aided by moving the limb in different directions. The limb must be placed in the position it occupied when struck by the missile before the finger, probe, forceps, etc., can be passed along the track, see also under lodging shell wounds. Finally paint the skin with the picric solution, and allow to dry while the towels are being placed in position. Hurry and lack of method in cleaning the skin will result in failure to achieve sterility.

2. *Excision of gutter wound.*—Small wounds can always be excised under local anesthesia. If adrenalin is added to the anesthetic solution, bleeding is negligible. Many large wounds can also be excised in this way, after very little practice. The raw surface of the wound is dried and repacked with gauze; small wounds may be cauterized. It is then completely encircled by an elliptical incision, which should not be less than one fourth inch from the edges and surfaces of the wound. It is advisable to complete one side of the ellipse first, cutting deeply through the skin and fascia together, and then deepening the cut rapidly until it has reached beneath the deepest part of the wound. This incision is then packed with gauze, while the other half of the ellipse is made, so cutting out a wedge of tissue enclosing the wound, and not opening into it at any part. The use of a finger in the wound sometimes enables one to cut clear of the pockets which would otherwise be opened. If this is done the same finger should be kept in the wound until the excision is completed; it is then disinfected, or the glove changed. No swabbing should be done during the excision, or if done, extreme care should be taken not to infect freshly cut surfaces. All bleeding is carefully stopped, and the wound closed with silkworm gut sutures, which should just emerge in the depth of the wound as they cross from side to side. Gum mastic varnish on the skin with several folds of gauze stretched tightly over it makes a good dressing, and the limb should be firmly bandaged to prevent effusion. The upper folds of the gauze may be stripped off after the first day, to allow inspection of the wound through the layer next the skin. If the original wound is opened into at any part during the operation, primary suture should not be done, without careful washing of the wound surfaces and smearing with paraffin paste, or the edges may be lightly drawn together over a paraffin or salt pack, or the wound may be left open and sterilized by the Carrel-Dakin method.

3. *Excision of superficial traversing wound with explosive exit.*—Pack the wound firmly with gauze. Enter the knife vertically not less than one quarter inch from the edge of the wound, and, keeping the blade parallel with the sides of the wound, cut all

the way around it, thus making a coneshaped excision of the wound. Further treatment is carried out as indicated.

4. *Tunnel wound*.—If superficial, draw a strip of gauze soaked in picric solution through the tunnel, and excise. If traversing the depth and no suspicion of gas infection exists, the tunnel may be cleansed by passing a forceps along the wound and drawing a suitably thick strip of gauze through it, after excising the entrance and exit wounds. Another strip, impregnated with antiseptic paraffin paste or iodoform paraffin, narrower than the diameter of the tunnel, is then drawn from side to side and left *in situ*. Narrow tunnel wounds should not have a rubber drainage tube drawn through them. This only blocks discharge. If near to a bloodvessel, it is liable to cause ulceration of its walls, and if near to an important nerve, may cause serious paralysis.

5. *Traversing shell wounds*.—Entry and exit should be excised by elliptical incisions. Usually it is unnecessary to excise more than one quarter inch of skin around the wound. As a general rule the area of skin excised varies inversely with the skill of the surgeon. In doing this, the knife should be plunged through the skin parallel to the track of the missile, and an attempt made to excise the tissues around the wound to the depth of a knife blade in one piece. The crushed muscle and aponeurosis in the deeper parts of the wound are seized with tissue forceps and cleanly excised. If sufficient access is not provided by the original wound excision, the ends of the ellipse should be prolonged, so that the sides of the wound may be retracted. It is well to remember that prolonged and forcible retraction of muscle is liable to crush its tender fibres, and render them a prey to saprophytes in the wound. The need for powerful retraction may be avoided by the use of free incisions. One may be pardoned for again pointing out that in dealing with the deeper parts of the wound it must always be remembered that the gravest danger arises from infection with gas producing bacilli, which grow most readily in dead and dying muscle.

The following points are important: 1. If a muscle is deprived of its blood supply it will not bleed when cut and will probably die. 2. A dead muscle will neither contract nor bleed when cut. 3. A muscle in the first stages of invasion by anaerobes, possibly when poisoned by toxin, loses its normal resilience and has a peculiar brick red color. 4. In the later stages of invasion, the muscle becomes crepitant and exudes a dark reddish brown foul smelling fluid. Taken singly, the most important of the signs in prophylactic treatment is absence of bleeding on section. A muscle may fail to contract when cut, so that if this sign is present alone the muscle need not be excised. A very useful procedure for beginners is to stain the dead or dying tissue along the track by injecting a two per cent. solution of methylene blue or 0.5 per cent. solution of brilliant green. This can best be done by passing a catheter or other rubber tube along the track and squirting the solution along it. All stained tissue at least should be excised.

6. *Lodging shell wounds*.—These are to be dealt with on the same lines as traversing shell wounds with the addition that every effort should be made to find and remove the shell fragments and any particles of clothing carried with it. To this end exploration by sight is more valuable than by sense of touch alone, whether x ray localization has been done or not. In these cases it is sometimes difficult to find the track of the missile. If the skin and facial wound are excised and then the limb be moved, so that the muscles and skin assume different relative positions, the track will become visible, and its direction may be gently explored with the finger and excised. In cases in which the metal fragment is lodged among pieces of bone in positions where the wound cannot be opened up, the Mackenzie Davidson telephone probe or other electrical apparatus may be of great service. Lodging wounds often need a counter incision, either for the purpose of removing the projectile or to provide drainage. The objection to dependent drainage openings if the Carrel-Dakin treatment is to be adopted must, however, be borne in mind.

7. *Multiple wounds*.—These deserve separate mention on account of their frequency, and by reason of the special problems they present. The condition of the patient often will not allow one to deal with each wound as thoroughly as could be wished. The first thing to do is to determine the general direction of the projectiles. A search will generally reveal a graze, a gutter, or tunnel wound, giving a clue to the course of the others. It then remains to decide which wounds should be first dealt with. Excluding fractures or penetration of the body cavities, lodging wounds of the buttocks, thighs, calves, shoulders, and root of neck should receive preference. As a general rule, patients with multiple wounds should receive the attention of two or more surgeons. Experience has shown that in such cases if operation extends much over an hour they often die.

Hemostasis.—At the conclusion of all these excision operations, great care should be devoted to hemostasis, because pools of blood allowed to accumulate in corners of the wound favor the progress of sepsis. Seeing that these wounds are accompanied by much crushing of tissue, a plentiful supply of thrombokinase will be present, and once the larger vessels are secured, oozing may be stopped by pressure.

AFTER-TREATMENT.

The great indication during the early stages of this period is to provide as much rest and nourishment as possible. The severely wounded man has previously come through such a period of mental and physical stress that his nervous system is more or less exhausted and this exhaustion reflects itself in impairment of the functions of all important organs and in his power of repair. Therefore it is necessary to treat him with the utmost consideration in every possible way. This remark applies in a comparative degree also to the man who has received minor injuries. No wound can be treated without respect, and careful watch must be kept even on the most trivial because every now and then, with sometimes very little warning, complica-

tions such as tetanus or acute streptococcal septicemia may set in and cause rapid death. Rest must be procured by sedatives if necessary. Usually some preparation of opium is used. The preparation used should vary with the particular case. While morphine is the drug chosen for general use, it is not so good as pantopon or heroin for chest cases or pantopon for abdominal cases. In the latter it has a much greater inhibitory effect on the bowel than pantopon.

The severely wounded man must be given nourishment which he can digest. The writer has found peptonized cocoa and milk of considerable value in many cases. The patient must be kept cheerful and encouraged in every way. The presence of moribund cases has a depressing effect and an excuse can usually be invented for removing them to another part of the hospital or at least to one end of the ward. Cases in which there is danger of the development of gas infection should be flooded with alkalis by the mouth, by the rectum, or, preferably, intravenously. While the danger lasts protein foods should be given sparingly. Easily assimilable carbohydrates should form the staple diet, candy sugar by the mouth, glucose intravenously, and so on.

For patients who have suffered from severe shock, it is a good working rule not to evacuate them to hospitals farther down the line until at least twenty-four hours after the pulse rate has descended below one hundred except when a distinct and not dangerous explanation for the continued acceleration exists. Cases of this nature, when evacuated too early during periods of severe fighting, have died on the train or shortly after arrival at the base from a recrudescence of their shock. This fact is merely another indication of exhaustion of the nervous system or a fulminating septicemia stirred up by transport in a patient whose resistance is feeble.

In other respects each case must be treated on its merits. No wound should be dressed unless some special indication is present and every wound should be closed as soon as its condition will permit. The general principles indicated in this and other papers on regional wounds should be followed throughout convalescence as well as at operation. Some patients have to be retained in casualty clearing stations for considerable periods. Massage of the surrounding parts and passive movement of the neighboring joints should be begun as soon as such procedures do not produce local or general reaction. Active movements should then very soon be encouraged in gradually increasing degree.

The part of the above article referring to classification of wounds and of methods of treatment has been modified from an article by Captain C. H. Upcott, which appeared in a pamphlet on Surgical Treatment of War Wounds distributed to medical officers of the army in February, 1917.

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SURGERY IN A BRITISH BASE HOSPITAL.
IN FRANCE.*

BY MAJOR ALLEN GREENWOOD, M. R. C., U. S. ARMY,

Sanitary Officer, Harvard Surgical Unit, Base Hospital No. 22,
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When Doctor de Schweinitz asked me to come to Philadelphia it was with the understanding that I should give you simply some of the experiences of the Harvard Surgical Unit in France. This I can do best by means of the lantern slides which will show you our hospitals, some of the patients, and our methods of treatment.

The first picture shows one of the towns of northern France given over to the British Army for hospital work. I may say that the work of the Royal Army Medical Corps in England and France shows the highest order of efficiency. I doubt whether any organization could show it more markedly. All along the coast are base hospitals. An old castle, now used as one for French wounded, was built by Charlemagne in 811, and here Charles Dickens lived and wrote "The Tale of Two Cities." I show you the walled town of Montreculx from whence came the Earl of Montreculx who gave the city of Montreal, Canada, its present name.

The sanitary problem is a very interesting one. Having had experience in this work during the Spanish-American War, I was asked to be Sanitary Officer in our service in France. Everything likely to cause pollution had to be destroyed before going into the ground. I felt it an honor to the Harvard Surgical Unit when General French stated that the sanitary condition of Base Hospital No. 22 was one of the best in that region.

From the hill back of our hospital after dark could be seen the light of the gunfire on the Somme; looking across to England could be seen three or four coast lighthouses, causing one to feel not entirely out of the kindly touch of mother England.

All the things in our tents could be put in a dunnage bag to be carried on the shoulders. The nurses who stayed in France in the last three years have had an uncomfortable time. They have to stand up under a strain such as nurses in this country know nothing about. I cannot begin to tell you how much a hospital of this sort depends upon the nurses, and how much wonderful work these brave women are giving to the service in France, to the British Government, and to our own. In the summer of 1916 in one instance 513 badly wounded soldiers were received in our hospital within two hours. It would be difficult to imagine taking into any hospital in Philadelphia 513 patients in two hours' time. Seventy-five per cent. of all penetrating wounds caused by shell fragments entering the hospital in the summer of 1916 gave a culture of the gas bacillus. The type of injury giving the most serious trouble is that which includes the carrying of pieces of clothing into the body. This results in a very serious form of gas gangrene. From an ophthalmological standpoint one type of interesting cases were those showing hemianopsias

*Read before the College of Physicians of Philadelphia, on Wednesday, February 6, 1918. Published by permission of the Surgeon General, U. S. A.

due to injury of the posterior part of the brain. Upon trephining the hemianopsia frequently disappeared.

One of my most interesting cases was a young Scotsman who had a small perforating wound which took away part of the humerus and the whole arm was infected with the gas bacillus when he entered. Instead of amputating at the shoulder, an incision was made across the arm, cutting all tissues but those on the inner side, giving good drainage, and three weeks later the man walked out of the hospital. No one who saw his early condition expected him to recover. In another case, a boy of eighteen, we amputated at the shoulder for a similar condition. The bone was badly shattered, everything was gangrenous, but not so high in the arm. After amputation we left everything wide open in the wound, except for the gauze packing. At the end of the operation, which took only about fifteen minutes, he was apparently going under, as he had had a hemorrhage before being brought into the hospital, and had been in No Man's Land for three days in a very pitiable condition before being picked up. I stayed by his side in the operating theatre until seven the next morning, when I told the nurse to have him moved across the ward. Three weeks later he went home. It was one of the greatest pleasures that has ever come into my life to send that boy back to his parents, and I felt that my all-night vigil had been well repaid.

I could tell you if time permitted much of the many interesting ophthalmic cases which presented the sad side of the work in the often resulting blindness. In many instances the injuries have involved the destruction of both eyes and surrounding tissues, and yet, have not been severe enough to cause death. The other cases which are most baffling are those of gas gangrene, and it is to be hoped that the antitoxin for the bacillus Welchii which has been produced in this country will be the means of removing this scourge of modern military surgery.

I wish I might say that which would bring to you and through you to your patients and friends the full realization of the meaning of this war. The Government is performing a superhuman task. The attitude of the public at large, however, is not what it should be. We know very well that the winning of this war depends largely upon foods. The farmers must produce more foodstuffs. This requires labor, and yet if you look about you you will see thousands of chauffeurs who drive their employers for pleasure only and who could be released for such work. You see people riding about in their automobiles almost as much as ever they did and with little concern. Some one must make all such people realize the war to be the most serious business which has ever come into our lives, and that, besides giving of our time and labor, there must be extra sacrifices by the people of this country such as they have never known.

The Harvard Surgical Unit with its hospital, one of a group of five base hospitals, was, early in the war, caring for 2,300 beds, and in a short space of time was receiving its quota of the men with their ghastly wounds coming by the thousand from the trenches—trenches which in the first part of the war

were filled with mud and water and slime. The spirit of cooperation with which the nurses and doctors have done this work is perfectly wonderful. To a certain degree I found the same spirit upon inspecting some of the cantonments in this country, which work I have done for the Surgeon General's Office. The medical men who have gone into the war realize that cooperation is required to secure efficiency, that every man must put his shoulder to the wheel and be ready to do his best. He must remember that he is first, last, and all the time, a doctor. No matter whether he is an ophthalmologist, or other specialist, if he has ever been capable of doing minor surgery, he must now turn his hand to it. If he has done sanitary work, he should be ready to do that. There is a sad instance in this country in which a special surgeon refused to "carry on" because he was appealed to to take care of a few cases of measles. Perhaps he did not know the latest methods of treating this condition, but he could have gone in and done his bit to the best of his ability when, in that particular hospital, there were many hundred such cases. He was not willing, however, to give up his prerogative of being a specialist!

MEDICAL NEWS FROM WASHINGTON.

Interpreting the Medical Problems Cases to Be Studied at Washington.

The necessity of immediate steps toward combating the mosquito has been brought to the attention of the acting secretary of war by Surgeon General Gorgas. It is shown that mosquito breeding is about due in the south where cantonments and mobilization camps are located, and that it shortly afterward will extend to northern localities. It will be a waste of time, labor, and material to carry on thorough measures within the military reservations to eradicate mosquitos unless effective measures are applied against them outside the reservations, in view of the fact that the anopheles mosquito will fly for approximately a mile. If breeding is permitted to any extent within range of the reservations, its results are bound to be felt in the prevalence of mosquito borne diseases among the troops.

The Public Health Service, which has done much sanitary work in the vicinity of military reservations, is not equipped in personnel or funds to carry on the work in zones outside the reservations. So it has been recommended that numerous activities be carried on under military control outside of the limits of reservations to safeguard the health of the troops and prevent epidemic and contagious diseases. It is intended that the work relating to the eradication of the mosquito from the extra cantonment zones shall be conducted by the Army Medical Department, instead of by the Public Health Service, in view of the latter lacking personnel and funds.

There has been added to the curriculum of the Naval Medical School at Washington a department for the study of the effect of poisonous gases such as now used in warfare. It consists of lectures on the methods employed in Europe and defensive means taken, and drills in the various uses of different types of masks, with experiments in the gas chamber with various types of gases.

Editorial Notes and Comments

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POLITICS OR HEALTH, WHICH?

From the conflicting statements appearing in the newspapers it is a little puzzling to know just what the present investigation of the Department of Health means. Commissioner Amster stated it was being conducted to determine whether the present bureau recognition of the Department of Health was legal. The Mayor's letter to the Civil Service Commission was similar in tone, and intimated that most of the bureaus were illegally established and should be abolished. Following the very prompt and widespread public remonstrance against any political interference with the Department of Health, the president of the Civil Service Commission declared the investigation to be primarily a graft hunt, and no honest official need fear. The sudden shift is suggestive.

Those of us who have watched the evolution of the present admirable organization of the Department of Health and are familiar with the very effective work it has accomplished, must regard with grave apprehension any proposed change, either in this organization or its personnel.

The directors of the various bureaus have demonstrated an unusual fitness and ability, gained as the

result of years of intelligent and devoted service in scientific health administration. A modern health organization cannot do effective work without commanding the services of experts, and to decry the value of such services indicates a lack of understanding.

The present organization of the Department of Health is the logical outcome of the good work it has carried on. To return to the primitive organization of two bureaus, as established in 1852, would constitute a deplorable step backward.

Let the present administration realize the danger to the city of disturbing the excellent work of the Department of Health as now constituted.

RECONSTRUCTION IN CANADA.

The latest announcement of the provision in Canada for returned soldiers states there are 12,291 hospital beds available, and the discharge depot has approximately accommodation for 2,300 more, thus bringing the total up to 14,591. At least 10,205 beds are in buildings taken over and remodeled by the government, while in structures erected from the ground up, accommodation has been provided for an additional 2,795. The existing general hospitals of the Dominion have provided accommodation for 1,591. The programme is to construct buildings providing for 3,925 beds for immediate occupation. The unit plan has been adopted in the provision of all military hospitals, so that new units may be added at any time; the present contemplation then is for 20,366 beds to keep abreast of requirements.

As to orthopedics: Quite recently a large industrial building was purchased in Toronto, which will, when altered, be one of the largest military hospitals in Canada, in fact, the chief orthopedic centre of the Dominion. When the progressing alterations are completed there will be accommodation of from 800 to 900 beds, and adjacent to that building there is sufficient land upon which to erect from time to time additions to the hospitals, so that the accommodation can be brought up to 12,000 to 15,000 beds.

Concerning the dearth of qualified masseurs: a school was started at Whitby, Ontario, under the direction of Lieutenant Kendall, as massage was a profession in Canada of very limited extent. As the first plan of training sufficient returned soldiers did not prove satisfactory, as they did not take to the profession, the doors were opened to women. A second class was opened at Hart House, Toronto, under Dr. Margaret Patterson. Graduates of those institutions are being scattered over Canada. The course lasts for six months, with further six weeks'

instruction in reeducational work. The subjects taught are practical massage, anatomy, physiology, electrotherapy, and remedial gymnastics; and each day's work starts for the students with a strenuous physical drill. The pupils, during the time of instruction, receive \$25 a month allowance; and, on finishing their course, they sign an agreement to serve for one year in any part of Canada in the military hospitals. At the end of that year they receive their diplomas, and during their working time they receive \$55 a month. So far all the graduates of those schools are still serving in the seventy odd military hospitals stretching over Canada from Halifax to Vancouver.

Up to December 31, 1917, Canada had cared for 2,871 tuberculous soldiers, of which number 1,983 had been overseas, and 888 in the training camps throughout the Dominion. The number of patients discharged or dead up to the end of the last year was 1,466—803 had been overseas, and 663 had not left the country.

A statement of complete records regarding amputation cases was issued on January 15, 1918. In all, 1,051 such Canadian soldiers had been returned to this country. Those who have been discharged number 266, the others still remaining in hospital. When these cases came to be classified it was found that 328 men had lost arms; 723 legs. Of the men still in hospital on the above date seventy-three had lost arms above the elbow—144 below the elbow; of legs, below the knee, 194, and those above the knee 374. From the beginning of the war to the end of September last, out of 774 totally blind soldiers admitted to St. Dunstan's and other hospitals in England, thirty-two were Canadians, and of those twelve have returned to civilian life in Canada on a selfsupporting basis. From the foregoing it will be seen the extent of the problem of reconstruction in Canada, and the efforts put forth by that country to grapple efficiently with the problem. By education and vocational training many will subsequently be returned to civilian life.

REST CURE THROUGH THE INFINITY OF TIME.

Rest cures hold out hope of relief to victims of psychoneurotic disturbance. Apostles of recreation and play offer these as antidotes to the nerve racking strain of the workaday world with its strenuous demands upon endurance and effort. Other forms of escape from storm and stress are advocated or other antidotal methods are tried, with varying result. One thing is certain, the human spirit is not in truth satisfied or helped by any of these means, unless perchance through

them it inadvertently stumbles after all upon the essential something, which is an active and productive participation in the great creative mission of life.

This is the reason why psychotherapy proves efficient though hard to comprehend. It recognizes and acts upon the need of the human psyche to take its place in the onward movement of life and its embodiment in the human race. It has understood that this is not easily effected because there is also an opposing element in human and, as in all nature, an inherent inertia or indolence against which the active impulse has a continually renewed struggle. Emphasis upon rest cures, recreation measures, all the things that conduce to this indolence and foster the infantile dependence upon some "everlasting arms" or other, is therefore wide of the mark, actually bad therapy.

Psychotherapy rejoices therefore when there is presented some new vision of the everlasting arms toward which the human soul forever yearns, extended, however, not in invitation to rest and dependence, but to embrace the individual psyche in the movement of ages. It is an invigorating tonic and a most complete alternative to bring the individual into the vastness where racial growth, struggle, achievement lie, not that he shall lose himself in the overwhelming greatness of the retrospect, but that he shall rediscover himself. He becomes an active participant, "doing his bit," in the work which stretches infinitely backward and infinitely forward, as compared with man's usual petty looking at the clock.

Professor Henry Fairchild Osborn has a peculiar power of simplicity and grandeur of reckoning in his concise handling of periods of time in his presentation of the records of past history written in fossil remains, rock formations, and the caves of the earth. His *Men of the Old Stone Age* strikes off the periods of time when man began to lay down those products of his activity which still survive in ancient traces. Reading, one is startled awake to think in periods of 25,000, 50,000, 100,000 years in the history of man. "After weighing all the evidence very carefully, the balance of opinion seems to sustain the view that this epoch should be placed . . . during the Third Interglacial Stage" which "opened about 100,000 years ago." This epoch is "the date of appearance of the Piltdown and of the Neanderthal races, and the whole sequence of climatic and geographic changes surrounding the early history of man." Having given two years for assimilation, to our mental nutriment and stimulation, of these figures thus strikingly brought to attention the same author varies his figures as he carries his readers into *The*

Origin and Evolution of Life. He is not here concerned with man, but with his forerunners in the history of life in its terms of energy capture, transformation, and use, so that now one's conception of life's activities must assume the length of millions of years. We may neglect for the present the computed age of earth and ocean. It is enough for the purpose in hand to swing into the movement of life, fossil remains of which, in bacterial forms already ancient, are "found in a section of a chlorophyllbearing algal plant . . . the age of which is estimated to be about 33,000,000 years."

There is indeed rest cure in this wholesome form of tonic strength as progress is traced in an expanding movement through great spans of millions of years. It eases the sharpness of petty adjustments and maladjustments along the little individual way to contemplate such measures in the progress of life. It is worth while to cultivate such an expansion of view and to realize that the fact of existence calls upon the individual to fit himself into the scheme. At the same time it aids in the understanding of the energy potentialities and therefore energy striving and its harmonies and disharmonies to discover it in such setting. Is there not therefore actual curative power in bringing a distracted patient into such a march of events? It also calls upon the physician himself to enlarge his horizon.

It will prove, however, no less true for him than for the selfcentered patient, that individual struggle, individual pleasure-pain will sink into insignificance before this con long picture of energy striving and energy achievement. Each one, moreover, must be stimulated to a new activity to make the life force within him add its share in the creative accomplishment of his own race and of life itself in its progressive development.

THE FOOD VALUE OF RAW EGG WHITE.

The long standing reputation of the raw egg, particularly of the egg white as a food of highest value and greatest degree of digestibility for young and old in health and in sickness, is not borne out by the newer findings. While Beaumont in his famous experiments with Alexis Martin's gastric fistula was the first to call attention to the fact that the raw egg white left the stomach unchanged, it is only recent experimentation that has shed a clear light on the subject. The unjustified reputation of egg white as a food is only paralleled by that of soups and meat extracts, yet the latter have a value in that they positively stimulate the flow of gastric juice, while raw white of egg, on the other hand,

only feebly stimulates it. It is like so much water in the stomach. Cooked egg white, however, calls forth a generous flow of gastric juice and unites readily with the hydrochloric acid. Besides being unaffected by the gastric juice when present in the stomach, the egg white leaves the stomach too rapidly for any action on it. Raw egg white is the only protein that acts in this peculiar way; the only one which leaves the stomach unchanged. Raw egg white resists the action of pepsin. Moreover, when it reaches the intestines it acts the same way. It does not call forth the flow of bile, and resists the action of all intestinal enzymes. It is also generally antitryptic, for it resists the action not only of human tryptic enzymes, but the animal and vegetable alike. But while it can be said that the raw egg white has marked antitryptic action, in reality it is the rate of action on it that renders it antagonistic to digestion. It seems to take about seventy-two hours of action on the raw egg white to equalize the short action of the same, cooked.

What is more important than the failure of digestion of this one food is the fact that in the presence of raw egg white the tryptic action of the enzymes is prevented for other proteins. This arises from the colloidal nature of the raw egg white, which absorbs the enzyme and prevents its action on the other proteins. Charcoal seems to have the same action. The feeding of excessive amounts of raw egg white causes its appearance unchanged in the feces. Often it excites a troublesome diarrhea accompanied by marked loss of weight instead of the increase for which it has had a reputation. Mere drying of the egg white does not make it more digestible nor overcome its action to diarrhea. The ingestion of large quantities does not cause an albuminuria, nor does it increase an albuminuria already present, as it would be likely to do if the excessive amounts of this food were digested and absorbed. Heating the raw egg white to 70° C. obviates all these difficulties, and it is made digestible by combination with dilute acids or alkalis or by predigestion after extremely long contact with the digestant. For rectal feeding it has no value. Indeed, no protein is of value in this form of alimentation when administered unchanged. On the other hand, raw egg yolk is digestible. The frequent digestive disturbances from its excessive use are caused by its high fat content, and the indigestion is the usual fat indigestion. Raw egg white is not really harmful, but it must be remembered that in keeping with newer findings, it must be cooked.

THE LEARNED LAITY.

Ontario doctors have been rather severely handled by Mr. Justice Hodgins in his Report on Medical Education and Practice in Canada (*Canadian Medical Association Journal*, March, 1918). Speaking of osteopaths, Christian Scientists, etc., he says the attitude of the profession is that of those who know nothing of them and want to know nothing. He finds that osteopathy is steadily finding its proper place and has a certain value as a special branch of medicine. "Christian Scientists cannot be deterred by law from practising the tenets of their religion, but they should conform to the present or future health regulations, and, when acting for gain, should be required to possess sufficient medical knowledge to recognize disease pronounced by the health officers to be communicable. Optometrists should be required to pass a specified examination that would require ability to detect disease through the eyes; to have knowledge of the physiology and pathology of the eye and a thorough knowledge of practical optics and refraction."

He is clearly of those who say of certain remedies that "they may do good, and will not do any harm." Perhaps he has not yet had an inflamed vertebra rubbed by an osteopath, or a gangrenous appendix growing ever greener under prayer, and would probably be the first, as a justice, to condemn the mother who allowed her baby to make a meningeal exit from the world tended only by a (*pseudo*) "healer."

Failing his ability to be always around to look after Canadian practitioners, he endorses an opinion to have a provincial medical director, to whom, among other privileges, "the public might appeal against evils which monopoly among the doctors gives rise to. The profession, moreover, requires to be protected against itself; against sloth and inefficiency in the conduct of its preparations as well as its practice, and against inability or unwillingness to receive or try out new ideas or new methods."

But, even as we entrench ourselves behind the fact that this province gave us such men as Osler, Cullen, McCrae and many like them, the commissioner himself sounds quite a cheerful note in adding that "It is encouraging to know that some of the younger men are moving in the direction of giving physical therapy its due place." Admitting that commissions are a necessary infliction, and that doctors might often advantageously allow unqualified practitioners at the bedside, we mentally see the crowd of patients who will read the report and condemn wholesale all doctors because of it.

THE STAGE DOCTOR.

In view of the important part which the doctor plays in the life of the community it is not at all surprising to find that he is occasionally made use of by dramatists. Just now there seems to be a recurrence of stage doctors, the most recent addition to the list being Doctor James Pendergrass, a country doctor from Brasstown, Ky., who sells his household furniture for \$20 and abandons his single patient in order to take over the sanatorium which is

left to him by his uncle with the proviso that he shall cure ten patients in thirty days.

William Hodge, who plays the part of Doctor Pendergrass, has a convincing Kentucky accent and acts the rôle of the therapeutic nihilist quite acceptably. By a mild subterfuge he inveigles his patients into taking the exercise needed to restore them to health and, being the star, of course wins the sanatorium and the pretty girl who is thrown in for good measure by the dramatist, although not specified in the will. The comedy is bright and well played, the most interesting feature being the hypochondriac patients of the fashionable health resort, who are well drawn and characteristic. The surpassing virtues of the hero are balanced so far as the credit to the medical profession is concerned by the fact that the villain who rifles a safe and plots to defeat his claims to the sanatorium is likewise a doctor. It is unfortunate that the negro butler, so essential to every play the scene of which is laid in Virginia, could not have been as careful of his accent as the star. It is rather singular that in view of the great preponderance of brown negroes that he of the stage should be invariably a blacker black than any ever met with in real life.

Another comedy, a comedy of the films, has just appeared on Broadway in which doctors and hospitals play leading rôles. Though the title is *The Woman and the Doctor*, it is based on Mary Roberts Rhinehart's clever story "K" and is very well done indeed. The hospital scenes, and there are several, are particularly well staged, so well that one rather expects to find on the programme an acknowledgment that "The hospital equipment was furnished by the — Company, such as appeared on the programme of that entertaining doctor comedy, *The Boomerang*, which is now on tour.

These three plays provide a wide range of doctors to choose from. Doctor Pendergrass is the honest, shrewd, country practitioner; Doctor Parker the clever, smooth, unscrupulous scamp, who unfortunately is found in medicine as well as in other professions. "K" is the great surgeon whose technic has placed him in the forefront of his profession and whose mind and heart are equally admirable. Doctor Max is the brilliant young surgeon who is caught by the glance of every pleasing eye and who disturbs the discipline of the hospital by untimely flirtations with the nurses, while his brother is the honest, plodding, dependable family practitioner who, happily, constitutes the great bulk of the medical profession.

News Items.

American Public Health Association.—The annual meeting of this association will be held in Chicago, Ill., October 1-5, 1918. The president of the association is Dr. Charles J. C. O. Hastings, of Toronto. The principal topic of discussion will be The Health of the Civil Population in War Time.

Industrial Efficiency and the War.—This is the topic selected for the Cutler lectures which will be given on Thursday, April 25, at 8 o'clock, with Dr. Howard Crosby, of the Medical School of the University of New York, professor of physiology at the College of Physicians and Surgeons, Columbia University.

Leper Colony Buys Thrift Stamps.—The lepers at Moakai, one of the Hawaiian Islands, have bought \$3,000 worth of thrift and war savings stamps as their contribution toward the cost of winning the war.

Medical Supplies for Italy.—Authority to purchase surgical instruments and surgical supplies to the amount of \$230,272 for shipment to the Red Cross commission for Italy has been given by the war council of the American Red Cross.

Belmont Memorial Hospital to Be Taken Over by the Government.—It is reported that this hospital, which was opened in Hempstead, Long Island, some years ago by Mrs. Oliver H. P. Belmont and subsequently closed on account of protests made by Nassau County residents, is to be taken over by the government and used for the soldiers at Camp Mills.

Combined Meeting of Canadian Medical Societies.—During the week of May 27th the following societies will hold their annual meetings in Hamilton, Ontario: Canadian Medical Association, Canadian Association for the Prevention of Tuberculosis, Canadian Public Health Association, Ontario Medical Association, and the Ontario Health Officers' Association.

Montefiore Home and Hospital.—The annual meeting of the contributors to this institution will be held Sunday morning, April 28, at 11 o'clock. The president and committees will submit their annual reports and there will be a special meeting to ratify the resolution recently passed by the board of directors providing for certain alterations in the by laws of the institution.

Rehabilitation Clinic for Soldiers and Sailors.—The State Board of Charities endorses the plan to establish in the building at Stuyvesant Square and Fifteenth street, formerly the New York Infirmary for Women and Children, a clinic for the rehabilitation of wounded soldiers and sailors. It will be modeled after Hart House in Toronto, the only institution of its kind in North America.

Bureau of Medicine and Surgery Establishes a Research Division.—A research division has been established in the Naval Bureau of Medicine and Surgery to investigate the chemical and physiological phases of modern warfare, dealing especially with gas warfare, submarine service, and deep sea diving. While these subjects might seem at first widely separated, they have many features in common. In modern warfare, attention has been directed to the necessity of providing the personnel not only with good food, clothing, and housing, but above all with good air.

The Whitney Bill Passed by the Legislature.—The Whitney bill providing for a commissioner of drugs to regulate the prescribing and dispensing of narcotic drugs in New York State has been passed by the legislature. A hearing before the Governor on this measure has been requested on behalf of the Medical Society of the State of New York by the acting president of the society, Dr. Thomas Halsted, of Syracuse. A similar request has been made by Dr. De Lancy Carter, of New York, on behalf of the American Society for the Study of Alcohol and Other Narcotics; by Dr. John A. Cutter, of New York, for the Federation of Medical Economic Leagues, and Dr. John P. Davin, of New York, for the Association of Medical Defense. The Governor has granted the request.

Surgeon General of Australian Army Visits the United States.—Surgeon General R. H. Fetherston, of the Australian Army, accompanied by several members of his staff, spent some two weeks in the United States on his way to the seat of war. During his stay here, General Fetherston visited the Surgeon General's Office, inspected the medical supply depots in Washington and New York, and also visited the medical officers' training camp at Fort Oglethorpe, Georgia, under the guidance of Colonel Munson, of the Surgeon General's Office. On leaving New York, General Fetherston will visit Canada and inspect the Canadian hospitals, cantonments, and medical supply depots before going to the front. Among the members of his staff was Major D. A. Cossar, staff officer for the pharmaceutical service, a pharmacist, who, under the Australian form of organization, is the head of the medical supply department of the army. Major Cossar is on his way back to Australia, having spent the past nine months in an inspection of the Australian troops in Egypt, Palestine, France, and England. He has also studied the organization and work of the medical supply departments in the United States and in Canada.

New Department Opened in Montclair Hospital.—Announcement is made that a department devoted to the treatment of cardiac disease has been opened in the Mountainside Hospital, Montclair, N. J. The Williams-Hindie electrocardiograph is used and is said to be the only one in use in any institution in New Jersey. Dr. Henry Wallace is director of the department and Dr. Harvey M. Ewing is associate.

Meetings of Medical Societies to Be Held in Philadelphia during the Coming Week.—Monday, April 22d, Genitourinary Society, North Branch of the County Medical Society; Tuesday, April 23d, Jewish Hospital Clinical Society, West Philadelphia Medical Association; Wednesday, April 24th, County Medical Society, Neurological Society; Thursday, April 25th, Pathological Society, Southeast Branch of the County Medical Society; Friday, April 26th, Medical Club (directors), Northern Medical Association, South Branch of the County Medical Society.

Expelled from Medical Society.—At a meeting of the Kings County Medical Society, held on Tuesday, April 16th, Dr. James P. Warbarse was expelled from the society because of the following paragraph which occurred in an article by him, published in a medical journal recently:

Furthermore, no one knows better than the physicians that the rich will be able to secure certificates of disability excusing them from service, while the poor man will not. We know how current and prevalent these documents will become and what a fruitful source of income these will be.

Nurses' Aids Needed.—Dr. S. S. Goldwater, chairman of the Mayor's Committee on Hospital and Medical Facilities, has issued a statement urging the training of nurses' aids by hospitals everywhere. In June, 1917, a plan of training for volunteer nurses' aids was inaugurated in nine hospitals in New York city. Four hundred and eleven of such aids have been trained in the New York hospitals, and 226 are now employed in these hospitals. This plan is the one followed in the base hospitals under the auspices of the Red Cross nursing service, and includes 120 hours of practical work. Candidates for admission are required to be between twenty-three and fifty years of age. This, of course, is not intended to interfere in any way with the regular training school nurses' courses, but has been inaugurated because it has become evident that the demand for nurses can not be supplied through the regular schools.

Clinical Opportunities for Naval Surgeons.—Admiral Gleeves, commanding the cruiser and transport force of the United States Atlantic Fleet, has issued a circular of instruction to naval medical officers stating that access to the clinics of the hospitals of Greater New York has been opened to naval medical officers, all of whom are welcome on presentation of their personal card without any further formality. All the city hospitals under the jurisdiction of the Commissioner of Charities have extended this invitation to the naval medical officers, besides nineteen private institutions. The commanding officers are directed to see that senior medical officers ascertain any professional limitations of their assistants and advise them to attend the clinics by which they will be most benefited. The medical officers will report such attendance on clinics and the results. The medical officers are warned against too great a degree of specialization if it is at the expense of general utility.

Meetings of Medical Societies to Be Held in New York during the Coming Week.—Monday, April 22nd, Medical Society of the County of New York; Tuesday, April 23d, New York Academy of Medicine (Section in Obstetrics and Gynecology), New York Psychoanalytic Society, New York Dermatological Society, Metropolitan Medical Society of New York City, New York Medical Union, New York City Riverside Practitioners' Society, Valentine Mott Medical Society, Washington Heights Medical Society, Woman's Hospital Society, Therapeutic Club; Wednesday, April 24th, New York Academy of Medicine (Section in Laryngology and Rhinology), New York Surgical Society, New York Society of Internal Medicine; Thursday, April 25th, Ex-Intern Society of Methodist Episcopal Hospital, Hospital Graduates' Club, New York, New York Physicians' Association; Friday, April 26th, Society of New York German Physicians, New York Clinical Society, Manhattan Medical Society, Society of Alumni of Sloane Hospital for Women (annual), Brooklyn Society of Internal Medicine, Italian Medical Society of New York; Saturday, April 27th, New York Medical and Surgical Society, West End Medical Society, Lenox, and Surgical Society, Harvard Medical Society.

Modern Treatment and Preventive Medicine

A Compendium of Therapeutics and Prophylaxis, Original and Adapted

THE TREATMENT OF HEMOPHILIA.

By LOUIS T. DE M. SAJOUS, B. S., M. D.,
Philadelphia.

(Continued from page 710.)

Calcium salts and gelatin, the therapeutic utility of which in hemophilia was discussed in preceding issues, manifestly do not directly make good—except in occasional instances in the case of the calcium salts—the blood fault which underlies the delay in coagulation. Better results by far have been secured through the use of normal blood serum in these cases. To what is this favorable action due?

Unanimity of opinion has as yet by no means been reached. According to Hess, 1916, it is believed that the main defect lies not in the bloodvessels, but in the blood itself. Added blood serum may thus be supposed to contribute some substance or substances lacking in the bloodstream in this disease. As Minot and Lee, 1916, state, the amount of fibrinogen in hemophilic blood is considered to be within normal limits. Various investigators have shown that a normal amount of fibrin exists in the hemophilic blood clot, which, when once formed, becomes as firm as a normal clot and retracts in a normal manner. Fibrinogen is therefore not the missing substance supplied by injection of normal blood serum in hemophilia. Again, from the standpoint of Howell's theory of blood coagulation, in which neutralization of an antithrombin is considered necessary, the defect in hemophilic blood is not an actual excess of antithrombin, for Howell himself, 1914, as well as Hess, 1916, failed to find any notable increase of antithrombin in hemophilic blood.

The missing substance, therefore, is probably one of the two remaining factors in coagulation, viz., the thromboplastic substance (Howell) or thrombokinase (Morawitz); prothrombin. Confronting Howell's view of prothrombin deficiency as the cause of hemophilia with the Morawitz-Sahli view of a thrombokinase deficiency, we may notice as possibly significant the fact that both prothrombin and thrombokinase are substances derived, in part at least, from the blood platelets. The prothrombin is believed to come from the leucocytes, and the thrombokinase from the tissues of the injured area. In so far as the portion of the thrombokinase derived from the tissues is concerned, there exists evidence suggesting that in hemophilia this product of the tissues is unimpaired. Thus, Hess avers that the tissue juices continue to exert their complementary coagulative function in hemophilia, and ascribes to this the fact that he could carry out venepuncture and antitoxin inoculations without troublesome hemorrhage at the sites of injection. He records also the formation of a cylindrical clot one half inch in length at a bleeding point on the tongue of a hemophilic, the clot, in extending, being "evidently held firm at its rim by the complementary action of the tissue juice, whereas the hemorrhage continued to

some degree in the centre." Such observations would tend to show that if, in hemophilia, it is the thrombokinase which is at fault, it is especially that portion of it set free in the blood itself, i. e., contributed by the breaking up of the blood platelets, which is lacking.

As for the Howell theory of prothrombin deficiency in hemophilia, this, it would seem, may again involve a defect in the platelets, prothrombin being derived from these bodies, as well as from the leucocytes. This is in accord with the findings of Minot and Lee, 1916, to the effect that in hemophilia the blood platelets are abnormal, their addition even in enormous amounts to hemophilic blood plasma failing to reduce the coagulation time to anywhere near the usual period, whereas addition of small numbers of normal platelets did cause hemophilic plasma to coagulate in an approximately normal time. The hemophilic platelets seemed qualitatively defective in being incapable of starting the process of coagulation as well as normal platelets, i. e., in terms of Howell's theory, they apparently do not give up their prothrombin as readily as normal platelets, and therefore act much more slowly in forming thrombin than the latter.

In the therapeutic administration of serum the difficulty is turned by the injection of ready formed thrombin—which remains in serum after clotting,—and this is seemingly the chief feature of utility in such a procedure. An artificial, extraneous coagulating power is thus conferred on the blood in a manner analogous to the induction of passive immunity by injection of immune serum. As in the latter instance, one cannot, from this viewpoint, expect the therapeutic result to be more than temporary. According to Sahli, 1910, who looks upon thrombokinase deficiency as the underlying defect in hemophilia, repeated injection of fresh serum—or repeated small venepunctures in the patient himself—may produce continuous benefit by indirectly stimulating the production of thrombokinase in the system.

Experience since Weil's introduction of serum injections in the treatment of hemophilia has shown that the coagulation time in these patients can almost always thus be greatly shortened. Fresh serum from any mammalian species seems to be effectual, though it is advised that serums from the ox and dog be avoided, as being more likely than others to induce toxic symptoms. The most potent serums have been found in the order of their efficacy to be human, rabbit, and horse serums. Human serum is more difficult to procure in the necessary amounts than the animal serums; rabbit serum is for practical purposes the most useful. Leary, 1908; Lucas, 1909, and Trembur, 1910, are among those who have reported good results from rabbit serum. Such serum is easily obtained by aspirating directly from the left ventricle with an ordinary needle and syringe, under aseptic precautions. The hair should be clipped or shaven from the precordium and tinc-

tuse of iodine applied before introduction of the needle. By this method five to ten mils of blood can be secured from each of a series of rabbits until the necessary amount is obtained, the fact being borne in mind that the blood will yield, after clotting, only about half its volume of serum. Each rabbit can be repeatedly bled at intervals of ten days or two weeks. To avoid the use of a number of rabbits, Lucas prefers to employ the Pasteur cannula test tube for tapping the carotid, thus obtaining a large amount of serum—as much as fifty mils—from one animal, obviating admixture of serums from different rabbits, and facilitating perfect asepsis. The dose of serum given subcutaneously ranges from ten or fifteen mils in a mild case or young infant to thirty or fifty mils in a more severe case or an older child. At times one or two doses suffice to control severe hemorrhage. In urgent cases the injection may be repeated at intervals of four to six hours, while in other instances injections may appropriately be given once daily or until no new hemorrhages have taken place for twenty-four hours.

Intravenous administration of serum has occasionally been carried out, and may of course be expected to yield results even more prompt than those following hypodermic use. The dosage is smaller, viz., ten to twenty mils in the severe cases. According to some, it should be employed only in extreme emergencies, and human serum alone used. Among twenty cases thus successfully treated by Leary, toxic effects—manifested in urticaria—were observed in but one instance. Certain authors have laid stress on the possibility of unpleasant anaphylactic phenomena upon repeated injection of serums in hemophilia. Apparently but little trouble in this direction has, however, been actually experienced. Trembur points out that difficulty from this source may be at least partially avoided by changing the kind of serum used when the slightest indication of anaphylactic disturbance is noticed.

(To be continued.)

Radical Cure of Inguinal Hernia under Local Anesthesia.—Anselme Schwartz (*Paris médical*, January 19, 1918) lays stress on the ease and satisfaction with which this procedure may be carried out provided certain technical details are duly attended to. He first injects the anesthetic solution in the line of incision—intradermally—and into the subcutaneous tissues. After incising the skin he lifts up the fat with thumb forceps and cuts it with scissors, in order to avoid the pain arising from contact of a knife with the underlying and as yet unanesthetized fascia. The next step consists in anesthetizing at once the aponeurosis and the entire contents of the inguinal canal, including the deep musculofascial layers. With a curved needle several syringefuls of solution are injected beneath the aponeurosis of the external oblique, both in the line of the proposed incision and at the sides. Below, an entire syringeful is injected in the direction of the deep orifice of the inguinal canal and around the cord. The aponeurosis of the external oblique and its prolongation over the cord are then incised, the margins of the opening retracted and, within, the

musculoaponeurotic sheet of the internal oblique and transversalis dissected and exposed and, without, the aponeurosis to the crural arch likewise. The tissues to be subsequently dealt with having thus been prepared, the conjoint tendon is incised and the sac sought and opened in a transverse direction. Omentum or intestine is reduced with a finger in the sac, and the posterior wall of the latter sought and pulled out with—superficially placed—forceps through the buttonhole in the sac. The posterior wall is now seized with two or three hemostats along a line perpendicular to the long axis of the inguinal canal, thus forming two orifices, one leading to the abdomen and the other toward the scrotum. Beneath the bridge of serosa held up by the hemostats, anesthetic solution is now injected with the curved needle, and the bridge is cut lengthwise with scissors, thus dividing the serous canal into two portions and facilitating dissection and resection of the abdominal portion. If the sac is voluminous, addition of anesthetic solution beneath the scrotal portion may be required. In still larger hernias it may be advisable, to avoid too extensive a raw area in the scrotum, to allow the scrotal part of the sac to remain; local anesthesia is therefore feasible even in hernias as large as a fetal head. In finally repairing the parietes no further injection of anesthetic is required. Two layers are placed in front of the cord, the first constituted of internal oblique and transversalis, drawn by U sutures to the deep aspect of the external oblique aponeurosis, near the crural arch; the second, of the external oblique, with suture to the underlying muscular mass formed by the first layer.

Sulphur Spring Cures in Syphilis.—R. Durand-Fardel (*Presse médicale*, January 17, 1918) states that while a direct antisiphilic action on the part of sulphur waters is no longer recognized, and the Wassermann reaction has eliminated the function of the sulphur springs in bringing out latent syphilitic lesions, its action as adjuvant to mercurial treatment is of considerable value. The sulphur cure is especially indicated: First, where, in the course of ordinary mercurial treatment, a patient shows marked intolerance of mercury or absence of therapeutic effect, the latter is due to "retention" of mercury. Intolerance may result either from unusual individual susceptibility or from treatment necessarily intense because of the syphilitic manifestations present. The sulphur cure, used from the start, greatly hinders the production of mercurial stomatitis, enteritis, erythema, etc. A second indication for sulphur treatment is, therefore, the institution of a mercurial treatment so intensive that the patient will not be likely to bear it well. Thirdly, in cases with anemia and nervous depression, it is useful as a tonic, and is believed to increase the number of erythrocytes and the extent of reduction of hemoglobin by the tissues. At the close of a course of mercurial treatment it may be advantageous to relieve the system of residual mercury, stagnation of which in the tissues cannot but be prejudicial even if only in rendering the system less susceptible to subsequent resumption of mercurial treatment. Analyses of the stools show that it will effect a demercurialization. Ingestion of the sulphur waters in doses of 300 to 800 grams is

the procedure of choice. Inhalation is of value where the waters upset the alimentary tract. The precise mode of action of the bathing procedures is not as yet known. According to Loeper, Bergeron, and Vahram, the useful effects of sulphur in syphilis can be obtained by intramuscular injection of colloidal sulphur, along with mercury. The usefulness of this procedure seems, however, diminished by a tendency to excessive reaction after the sulphur injections. Its only contraindications in syphilis are those applying in general to sulphur, which is badly borne as a rule by certain hepatic cases and cases of arteriosclerosis with congestive phenomena. No special relationship of sulphur to arsenobenzol treatment has been noted.

Treatment of Inguinal Hernia.—Guy P. Grigsby (*The International Journal of Surgery*, February, 1918) gives the following as factors which contribute to the success of the operation: selection of the proper procedure suitable to the case; asepsis; clean dissection with a minimum of trauma; complete hemostasis; removal of all foreign substances from the canal; free exposure of the shelving portion of Poupart's ligament and the external oblique muscle; accurate approximation of the muscles and fascia used to repair the defects and sutures loosely tied. When the cord is transplanted the danger of recurrence is less. In cases where it is not transplanted the Andrews operation, which consists in suture of the aponeurosis of the external oblique in conjunction with the internal oblique muscle to the shelving portion of Poupart's ligament. In all direct hernias the cord should be transplanted.

The Treatment of Infantile Paralysis.—John Carling (*California State Journal of Medicine*, March, 1918) says that active treatment of the paralyzed muscles should not begin until the acute inflammation in the cord has subsided. This may take from one to four weeks or longer, and is indicated by the absence of pain and tenderness on handling the limbs. To overcome the tendency to deformity, the joints should be manipulated several times daily and the limbs massaged to improve the circulation and nutrition of the muscles. The galvanic current, when combined with massage and muscle training, is of use in obtaining contraction of muscles that can not be contracted voluntarily, but when given alone at irregular intervals is of little value. The exercises should be given daily and continued as long as improvement is noticeable. If contractions are present they should be overcome before the exercises are begun. The object of a brace is to prevent deformity due to contraction of the unopposed muscles and at the same time encourage functional use of the limb. Patients with infantile paralysis are apt to be neglected after the acute stage has subsided, and are later found by the orthopedic surgeon to have various contractions and distortions of the limbs which need correction, sometimes by operative treatment. Tendon transplantation is to utilize the remaining muscular power to the best advantage, but it should not be performed until after every effort has been made to improve the nutrition and strength of the disabled muscles and the final degree of paralysis has been ascertained. As a rule,

a period of at least two years should intervene between the onset of the paralysis and the time of operation. It is of little use to transplant a muscle unless its origin is such that it can work to advantage at its new point of attachment. The induction of ankylosis may be combined with tendon transplantation to advantage in many cases. In young children the use of silk ligaments is preferable. Following these operations a cast should be worn at least four months, after which a brace should be worn. The results expected from nerve anastomosis or nerve grafting have not been realized.

Diagnostic Sign in Ruptured Digestive Ulcers.

—R. J. Willan (*British Medical Journal*, February 2, 1918) describes the occurrence of a transverse band or ring of constriction across the abdomen at the level of the lower rib margins and extending into both flanks. With this constriction there is no marked hyperesthesia and the patient is not conscious of its presence. Above the level of the constriction the abdomen is convex, below it is normal in appearance. The constriction disappears with the development of abdominal distention, but it often remains under general anesthesia. It is not possible to state whether or not the same phenomenon is to be found in other conditions than ruptured digestive ulcers. It seems to be associated with irritation of the ninth intercostal nerve and lies at the level of that nerve's distribution.

The Treatment of Septic Arthritis.—Robert B. Coffield (*The Ohio State Medical Journal*, March, 1918) points out that this condition may be purulent from the start or follow a serous synovitis. The diagnosis is usually made by means of the aspirating needle. The aspirated fluid is usually sterile although, occasionally, the streptococcus, staphylococcus or gonococcus may be found. Irrigating the joint with five per cent. phenol solution followed by fifty per cent. alcohol and normal saline is of great value. In gonorrheal joints normal saline irrigations at 115° F. have proven of value. After disinfection the capsule of the joint must be immediately closed tight and if a drain is used at all it should be placed outside the joint capsule for the purpose of taking care of the extra capsular infection. Through and through drainage tubes are dangerous. The joint should be put in a position of physiologic rest until the wound is entirely healed. Later, gentle passive motion, along with baking and massage, will help recovery. In case the ankle is involved the foot should be maintained in the position of slight varus and at right angles to the leg; if the knee, it should be put in sufficient flexion to secure relaxation of the hamstring muscles. The hip should be in slight flexion, abducted twenty or thirty degrees and neither rotated inward nor outward. The shoulder should be abducted at right angles to the body and the arm brought slightly forward. In the elbow a right angle position should be secured with the hand midway between pronation and supination, and if the wrist is the joint involved the hand should be secured upon a cocked-up splint with the wrist hyperextended in order that the pronator power of the hand is maintained. Fibrous adhesions should be broken down under ether anesthesia when all signs of inflammation have disappeared.

Hodgkin's Disease and Its Treatment.—W. W. Boardman (*California State Journal of Medicine*, March, 1918) reports a dozen cases of Hodgkin's disease treated with röntgenotherapy, and presents the following conclusions: The etiology of Hodgkin's disease is still unsettled, the diphtheroid organism seems likely to prove a mere saphrophite, and there is good reason to consider the disease a neoplasm closely related to lymphosarcomata and endotheliomata. Efforts must be made for earlier diagnosis, which must as yet rest upon the examination of an excised gland and not upon the examination of a blood smear. Treatment of early localized cases should consist of the radical removal of the involved glands and the removal of foci of irritation, together with thorough and persistent röntgen treatment of the operative field and of all neighboring lymphatic areas, especially the mediastinum; cure seems possible in these cases. In more advanced cases with wide dissemination, the only treatment is röntgenotherapy; if this be given thoroughly and persistently, remarkable temporary results may be obtained, and it is remotely possible that cure might be achieved. In the advanced cases he has seen no indication for surgery other than the removal of foci of irritation. Vaccine therapy has been a failure, and there is little reason to expect more from the immune serum.

A Rolling Crutch.—Robert G. Hall (*Journal A. M. A.*, March 9, 1918) says that when a step is taken with the common crutch the tip remains at a fixed point on the ground and the shoulder passes through an arc, the radius of which is the crutch. Thus the shoulder rises and then falls. He then describes a rolling crutch by which the shoulder is made to progress forward in an almost straight and horizontal line. The rolling crutch is the ordinary crutch to the bottom of which a thin, double flanged iron arc from fourteen to thirty-one inches long is attached and braced by one or two quarter inch steel rods on either side. The curve of the metal arc is that of a circle with a radius equal to the length of the crutch. The arc is three quarters of an inch in width and is covered with a piece of non-skid bicycle tire. The advantages of this form of crutch are many: the motion at the shoulder is in the direction of progress and not up and down; a longer step is possible with the same length of crutch; a more direct support is given at all stages of the step, the arms participate directly in the whole of the forward step; a better angle with the ground is secured; the crutch is more secure; reaching is largely eliminated; and there is less sinking in soft earth or snow. By means of an extra metal handle projecting at the level of the regular handle the patient can make the crutch either retard his progress down hill or aid going uphill. Among the disadvantages are its somewhat greater weight; greater expense; more complicated construction; and its tendency to be in the way in crowded places. This last has been somewhat overcome in the crutches with a long metal arc by making the two ends so that they can be folded up. The same principle has been applied to perineal crutches, foot extensions, leg braces, artificial legs, and even canes with advantage in all.

Cerebrospinal Fever.—H. D. Rolleston (*Lancet*, January 19, 1918) analyzes the results of serum treatment of this disease as seen in the Royal Navy and points out that of the several types of serum used that prepared by Flexner was the only one very effective. In cases not treated by serum the mortality was nearly fifty-three per cent. as compared with 27.5 per cent. for those treated with Flexner's serum. The earlier in the course of the disease the serum was begun, the better were the results. The administration of the serum was associated with serum rashes in about sixty per cent. of the cases surviving for over ten days. The intrathecal method of administration of serum did not seem to increase the proportion of cases of serum rash above that seen after other modes of administration. Similarly, the amount of serum given seemed to have little influence on the occurrence of rashes. In about fifteen per cent. of the cases with serum rash there was a recrudescence of meningeal symptoms at the time of the rash. These were relieved by lumbar puncture and seemed to be due to a direct involvement of the meninges similar to the local skin reaction. Grave accidents were very rare as the result of lumbar puncture and the intrathecal injection of serum.

The Treatment of Infected, Suppurating War Wounds.—Rutherford Morison (*The International Journal of Surgery*, February, 1918) uses the following technic: under an anesthetic, usually open ether, cover the wound with gauze wrung out of a one twentieth carbolic acid solution, and clean the skin and surrounding area with the same lotion; open the wound freely and, if possible, sufficiently to permit of inspection of its cavity. A guide should be introduced to the bottom of the wound and held there and fully exposed. In doing this special regard must be paid to nerve trunks and muscular branches of nerves, since the division of bloodvessels, excepting the largest, and of muscles themselves does little harm as compared with that of the disability following nerve damage. Cleanse the cavity with dry sterile gauze mops, Volkman's spoon, etc., and remove all foreign bodies; mop the surrounding skin and the wound cavity with methylated spirit and dry it; fill up the entire wound with bipp, which is a paste composed of the following:

Iodoform	16 ounces;
Bismuth subnitrate	8 ounces;
Liquid paraffin	8 ounces.

It should be rubbed in well and covered with dry gauze. All the excess should be removed, leaving only a thin covering over the wounded surface. Dress the wound with sterile gauze and cover all with an absorbent pad, which is held in position by sticking plaster and a bandage. This dressing requires no change for days or weeks if the patient is free from pain or constitutional disturbance. Should, however, discharge come through, the stained part must be soaked in spirit and a gauze dressing wrung out of the same applied as a further covering. Redressing is very simply done. After removal of the old dressings the wound is covered with a dossil of wood soaked in spirit, and the sticky, dirty looking discharge is wiped off.

The Treatment of Empyema.—J. Edward Pirrung (*The Ohio State Medical Journal*, March, 1918) summarizes the treatment as follows: purulent effusions are often unsuspected or mistaken for unresolved pneumonia or other intrathoracic complications; when correctly diagnosed, they are too often temporized with by aspiration; whenever operation is performed, drainage is often inadequate; the operation of choice is an early and wide incision of the pleura; excision of a rib or ribs may be required for adequate drainage and exploration; our efforts to improve the statistics of empyema can only be brought about by a more careful and accurate diagnosis and resorting to earlier operative intervention.

The Percy Cautery in Carcinoma of the Cervix.—Caryl Potter (*Medical Herald*, January, 1918) concludes from his own experiences, a consideration of the conditions to be relieved, and the mode of action of the Percy cautery, that this form of treatment alone is not sufficient for the complete destruction of either operable or inoperable carcinoma of the cervix, yet it has certain advantages. Thus, in cases on the borderline between operable and inoperable its use before operation may be of considerable help in reducing the size of the growth. Owing to the fact that a period of two to three months should elapse between its use and the performance of an operation, the Percy cautery should not be employed in operable cases because of the danger of metastasis during the interval of waiting. In inoperable cases the cautery may be helpful by delaying or preventing the development of general debility and intoxication, in destroying the offensive vaginal discharge, and in checking the bleeding and stopping the development of secondary anemia.

Salicaria in the Treatment of Enteritis.—H. Dufour (*Bulletin et mémoires de la Société médicale des hôpitaux de Paris*, October 25, 1917) writes concerning the rather numerous cases of infantile diarrhea in which diet changes as well as various other therapeutic measures fail to relieve. The cause of the condition may be either some obscure fault in the diet, congenital debility, or a mixed intestinal infection the true pathogenic organisms of which are as yet undetermined. The stools are frequent, green in color, more or less watery, and always abundant. Rapid emaciation results, frequently with associated gastric disturbances, vomiting, lung complications, and a febrile temperature. In such cases Dufour has seen his results improve markedly since he has been using fluid extract of salicaria—*Lythrum salicaria* or spiked loosestrife. Of this fluid extract 12.5 grains are added to .80 grams of syrup, and to infants four to six teaspoonfuls of the mixture are given daily. In conjunction with starvation—water alone being allowed—this remedy was found to overcome most cases of infantile diarrhea, the stools returning to normal in four or five days, and the ordinary feeding being resumed under far better conditions than prevailed when the drug was not in use. Tannin seems to play an important rôle in the action of the remedy, but this action is quite different from that of tannic acid. The salicaria tannin acts in much smaller amounts, and some other little known active sub-

stance is probably also present. Among adults, three grams of the fluid extract a day gave good results in enteritis with diarrhea. In two cases of dysentery with Shiga bacilli, rapid clinical recovery was obtained without the use of antidyenteric serum. In a case of chronic hemorrhagic diarrhea in an adult, failure of the salicaria to act led to more careful examination and the discovery of a rectal neoplasm, situated high up, as the cause of the diarrhea.

Chloroform Antisepsis.—Cabanes (*Presse médicale*, January 10, 1918), in the treatment of pus collections and infected wounds, recommends injections of a mixture of oxygen gas with chloroform and alcohol vapors. The mixture is introduced, after free surgical exposure, through one or several sterilized rubber tubes. Under this measure, suppurative discharge is rapidly lessened and the wounds assume a bright red coloration. The chloroform seems to enhance the leucocytic reaction against the infection, while the oxygen activates hemostasis. The general condition, even in the presence of grave forms of suppuration, shows rapid improvement and the temperature returns to normal in a few days. The treatment is painless and even locally sedative. It secures permanent antisepsis without wet dressings.

Investigation of Lipovaccines.—E. R. Whitmore, E. A. Fennel, and W. F. Petersen (*Journal A. M. A.*, February 16, 1918) present a preliminary report on their experimental work with several lipovaccines and call attention to the fact that the obvious expediency of preparing vaccines in a menstruum less readily absorbed than saline solution seems to have been entirely overlooked. The army vaccine contains 1,000 million typhoid and 750 million of each of the two paratyphoid organisms in a mil and the doses are one half, one, and one mil, respectively; a total of 6,250 million organisms being given in the three doses. The reactions are at times rather severe following one or more of the injections. If the mixed vaccine is prepared containing a total of 7,500 million organisms representing the three types, suspended in olive or almond oil, it can be given as a single dose with very little local, and almost no constitutional, reaction and the agglutinin titre following its use equals or exceeds that following the use of the ordinary vaccine, except for the paratyphoid B organism. Very promising results can be obtained in animals by the use of a lipovaccine from the pneumococci of types I and II, and the same can be said of a meningococcal vaccine made from Rockefeller strains 1, 10, 30, and 60, for both man and animals. Dysentery vaccine made with Shiga, Flexner, and Y strains seems almost devoid of toxicity and gives fair immune responses in animals. The advantages of lipovaccines over the ordinary ones seem to be: 1, the diminution of both the local and systemic reactions; 2, the possibility of giving the total immunizing dose at one injection; 3, the formation of a focus from which immunization continues for several months; 4, the detoxication of the vaccine by certain lipoids; 5, the prevention of autolysis and deterioration of the vaccine. The disadvantages are the greater difficulty of preparation and an increased expense.

Miscellany from Home and Foreign Journals

Immunity and Tissue Transplantation.—Moyer S. Fleisher (*Journal of Medical Research*, January, 1918) reports experiments on rabbits into which pieces of guineapig kidney were transplanted. The results in normal rabbits and in those immunized by repeated intraperitoneal injections of sterile emulsions of kidney cells are compared. The histological appearance in the pieces of kidney tissue is different in the normal and immunized animal, and there are differences in the rate of progress of events. The kidney of guineapigs transplanted into normal rabbits remains alive and shows regeneration at twenty-eight days, while no regeneration takes place in immune animals. The behavior of the leucocytes varies in the two cases, as they collect in larger numbers about the transplanted tissues in immune animals. They do not, however, penetrate the tissue as rapidly in the immune animals. In normal rabbits, the connective tissue formation and the penetration of the pieces by connective tissue cells is more rapid than in immune rabbits. While the difference in the reactions is marked, no conclusions as to their significance can be drawn until further observations have been made.

Vibratory Sensation in Differential Diagnosis of Cord and Nerve Affections.—R. T. Williamson (*Lancet*, February 9, 1918) has worked out the significance of loss of this sensation, as determined by placing a large, vibrating tuning fork over the several superficial bony prominences of the body, and gives certain of its differential diagnostic features. In lesions of the spinal cord loss of vibratory sense is often the earliest, or one of the earliest, indications of sensory affection. Only later do anesthetics develop. In lesions of the cord involving only the motor structures the sensation is well retained, as in anterior poliomyelitis, amyotrophic lateral sclerosis, etc. In paraplegias and parapareses loss of the sensation indicates extension of the lesion to involve the sensory structures, and here it may be the only indication of sensory involvement. In multiple peripheral neuritis this sensation is lost early and constitutes a valuable differential point between this affection and acute anterior poliomyelitis. Where, in paresis or paralysis of the lower extremities, the vibratory sensation is lost and other sensations are retained, and the patient continues to respond in this manner in the face of suggestions to the contrary, the occurrence of hysteria or malingering can be excluded. The sensation is lost very early in cases of tabes and is a valuable early sign. The same is true in the very early stages of combined posterolateral sclerosis. In lesions of a single peripheral nerve or nerve trunk the sensation is retained. In a case of localized paralysis a peripheral nerve or nerve trunk lesion can be excluded. In similar cases, if the vibratory sensation is felt and other forms are lost or affected the lesion is probably peripheral. In hemianesthesia if sensation is absent when the tuning fork is placed on the anesthetic side of the sternum and is felt on the other side the condition is one of hysteria or malingering.

Acidosis in Shock.—W. S. McEllroy (*Journal A. M. A.*, March 23, 1918) reports the results of a series of animal experiments to determine the relationship between shock and acidosis. While shock was often accompanied with a reduction in the alkalinity of the blood, there was no evidence that this was the cause of the shock. Further, the artificial reduction of the blood alkalinity by the intravenous injection of lactic acid did not hasten the production of shock or render it easier. And finally, the correction of the acidosis by the restoration of normal blood alkalinity through injections of sodium bicarbonate did not in the least influence the severity or fatality of the shock. The conclusion was reached that, in the form of shock dealt with, acidosis was but one of the many associated phenomena and was not causally related to the state of shock.

Cause of Muscular Atrophy after Nerve Section.—H. C. Stevens (*Journal A. M. A.*, March 23, 1918) recalls the theories of the existence of trophic nerves, or trophic nerve impulses as the explanation of various forms of atrophy and points out that increasing knowledge has failed in many cases to support these theories. Experiments were made on dogs to determine the cause of the muscular atrophy following nerve section and the conclusion was reached that the atrophy was due to the continuous fibrillary contractions which begin in such muscles about four days after nerve section and which persist until recovery of innervation is complete. These fibrillary contractions were noticed many years ago and their existence has been confirmed recently by Langley and Kato, but the relation of these to the development of atrophy has not been appreciated. Their importance is confirmed by the well known fact that overactivity and fatigue of a muscle are known to cause a shrinkage in its volume. These contractions, prolonged incessantly over many days and week, constitute overactivity and lead to fatigue and loss of muscle substance.

The Gelatin Tube and Digestive Power of Gastric Juice.—Ramond, Petit, and Carrié (*Bulletins et mémoires de la Société médicale des hôpitaux de Paris*, October 25, 1917) describe a simple procedure showing both the peptic power and hydrochloric acidity of given samples of gastric juice. Five mils of three per cent. gelatin solution are placed in a test tube fifteen millimetres in diameter, the tube sterilized at 100° C., and kept exactly vertical during solidification of the gelatin. Five mils of filtered gastric juice are placed over the gelatin, with 0.02 gram of thymol added. Allowed to stand at room temperature—15 or 16° C.—the tube shows a few hours later a definite ring in the gelatin, at a variable distance from its upper surface. This ring gradually travels down the gelatin, at a rate depending upon the acidity of the specimen of gastric juice. In anacidity or marked hypoacidity no ring forms. If for the gastric juice is substituted 0.1 per cent. sulphuric acid the ring travels down rapidly; somewhat less quickly with hydrochloric or nitric acid. With lactic acid of this strength practically no ring is formed and in the case of acetic acid, still less.

With the consentaneous peptic digestion of the gelatin the upper surface of the latter likewise descends, but much more slowly. To ascertain the rapidity of digestion a paper index may be pasted along the tube or the latter graduated in millimetres. Normal gastric juice digests, on an average, two and one half millimetres of gelatin in twenty-four hours. The digestion continues regularly till all the gelatin has been consumed. Normal gastric juice digests one mil of gelatin in sixty to sixty-five hours. Several tubes should be used for each specimen and an average taken; the levels of digestion in the different tubes are, however, always in close accord. Tubes with the gastric juice replaced by water, dilute acids, or unsterilized bouillon may be used as controls. As in Mett's method, hydrochloric acid may be added to the gastric juice, or the latter used as such, according as one desires to ascertain the strength of the gastric juice in pepsin or its peptic power under ordinary acid conditions. The acid ring in the gelatin is most clearly seen when the tube is held against the light.

Relation of Wound Flora to Secondary Suture.

—A. R. Munroe, A. G. Fleming, and R. M. Janes (*British Medical Journal*, February 9, 1918) call attention to the fact that military wounds are infected with many different organisms and that some fail to do well on secondary suture. The reason for these failures was sought and believed to be found in the nature of the infection present. Serious infection by the malignant edema group of organisms or by the virulent forms of streptococci apparently was the cause of the failure of secondary suture in the cases studied. It was found possible to determine in advance the presence of such infection by making wound cultures in meat medium and incubating both aerobically and anaerobically for several days. If streptococci were present in long chains, dominated the culture, rapidly digested and darkened the meat and produced gas and a foul odor, the wound should not be closed by secondary suture. The same was true when malignant edema organisms were found present and rapidly digested the meat, turned it black and produced foul gas.

Mixed Typhoid and Paratyphoid Fevers.—G. Etienne (*Bulletin de l'Académie de médecine*, January 29, 1918) notes that, as emphasized by Chantemesse and Grimberg, infection with the typhoid or a paratyphoid organism favors infection with another germ of the same group. He has seen a case of fatal typhoid fever with onset on the second day after defervescence from A B paratyphoid attack. On the other hand, there occur also cases of simultaneous invasion by two germs of this group. He has recently met in rapid succession with three cases of simultaneous typhoid and A paratyphoid infection, blood cultures showing both these organisms on the fifth, sixth, and eleventh days of the disease, respectively. None of these patients had received prophylactic inoculations. The onset was sudden in two cases and rather rapid in the third. Each case showed three or four secondary waves in temperature, at times with complete apyrexia in the phases of minimum elevation. The disease was severe in two patients, one, a child, showing the typhoid state and marked delirium; the other, an

adult, profound adynamia. In the third, the clinical picture was a recurring febrile gastric disturbance following a rather sharp onset of fever. In one case the profuse sweats characteristic of certain paratyphoid infections were present for three days in the third febrile exacerbation. The case in the child exhibited marked peritoneal reaction with meteorism, followed by pyelonephritis, pyuria, anuria, and grave uremic manifestations, and later by motor polyneuritis of the lower extremities. The second severe case developed on the thirty-third day a grave attack of adrenal insufficiency. The typhoid agglutination test in two cases became positive only at the time of the third febrile recrudescence. Paratyphoid agglutination was absent throughout in two cases, and slight and late in the third. This is not taken, however, to exclude participation of the A paratyphoid germ early in the infection, as a similar lack of agglutination had already been noticed in a series of undoubted A paratyphoid cases, with positive blood cultures. Probably the existence of a special strain of the A paratyphoid organism accounts for the discrepancy.

Etiology of Trench Fever.—X. Couvy and Dujarric de la Rivière (*Presse médicale*, January 24, 1918) report investigations leading to the conclusion that trench fever is a definite nosologic entity, due to a spirochete, which occurs in two varieties, a short form in the blood and an elongated one in smears from organs of an infected animal. Guinea pigs can be infected by inoculation with the blood of human patient, obtained during the febrile period. The infected animal exhibits a temperature curve similar to that of the diseased human subject. The spirochetes are best demonstrated by killing the animal during a febrile movement, death resulting from the disease itself in only about one third of all instances. The pathogenic power and immunity reactions of this spirochete permit of a clear differentiation from that of icterohemorrhagic spirochetosis.

Cultivation of Meningococcus from the Blood.

—F. W. Baeslack, A. H. Bunce, and collaborators (*Journal A. M. A.*, March 9, 1918) felt that the nature of the onset and of the early course of the disease in a number of cases of meningitis observed by them suggested that the infection might be a general one even in the early stages. Such cases presented the picture of marked toxemia without meningeal symptoms and with negative spinal fluid. Blood cultures taken in three such cases gave pure growths of the meningococcus and in all three this organism in typical form was isolated from the spinal fluid. Blood cultures were then made in a consecutive series of twenty-two cases without reference to the type of the illness, that is, whether septicemia or purely meningeal, and these were positive in over thirty-six per cent. Except in two cases only a single culture was made. These findings, together with the fact that the positive blood culture often preceded the development of meningeal involvement, and with the fact that many cases showed secondary metastatic meningococcal infections, led the authors to the belief that systemic infection was much commoner than generally believed and that it might occur without meningeal localization.

Etiology of Scarlet Fever.—R. W. Pryer and J. H. Kelly (*Journal of Laboratory and Clinical Medicine*, February, 1918) describe an organism isolated from blood cultures of a man who died of scarlet fever. This they believe to be similar, if not identical with, an organism reported by Cantacuzene, which he found in the throat of a scarlet fever patient, and with which he claims to have produced a disease in monkeys very like scarlet fever. The morphologic, staining, and cultural characteristics are discussed. The organism is apparently not pathogenic for rats, guinea pigs, or rabbits, as they are unaffected by either intraperitoneal or subcutaneous injections. Mice are killed after four days. While it is not claimed that the organism is the cause of scarlet fever, the authors believe it worthy of much proposed work.

The Etiology and Pathology of Rocky Mountain Spotted Fever.—S. B. Wolbach (*Journal of Medical Research*, January, 1918), after a recapitulation of his former papers, describes three cases of Rocky Mountain spotted fever, in two of which an autopsy was obtained. A study of this material substantiates his previous observations. The specific lesions of the disease are practically limited to the bloodvessels of the skin and genitalia. In addition, the gross post-mortem findings show enlargement of the lymphnodes, and an enlarged, firm spleen. In all three of the cases icterus was present. Microscopically, there was an extensive mononuclear phagocytic cell (endothelial cell) reaction common to most of the organs. The large bloodvessels and those other than of the genitalia and skin rarely show lesions. The cause of the disease is again stated to be the minute parasite previously described, which Wolbach believes to be a new form of microorganism.

Potassium and Sodium Iodides in Röntgenography.—Donald F. Cameron (*Journal A. M. A.*, March 16, 1918) points out that for use in the genitourinary tract for röntgenography a solution is required having as low a viscosity as possible and the minimum of toxicity and irritant action. The colloidal suspensions are not very satisfactory and the recently introduced solutions of thorium nitrate have the disadvantages of requiring considerable care in their preparation, of being expensive, and of not being commonly obtainable. Experiments show that both potassium and sodium iodides are quite opaque to the x rays in sufficient concentration, require almost no care in their preparation, are non-toxic and nonirritant, and both substances are relatively cheap and easily obtainable anywhere. A fifty per cent. aqueous solution is almost completely opaque to the rays, while solutions of half and quarter strengths are often perfectly satisfactory. Such solutions are also quite stable, can be sterilized by boiling, and are miscible with blood or urine without coagulation or precipitation. Up to the present few opportunities have arisen for their use in man, but animal experiments indicate the need for further study in order to make them available for human use, which seems merely to be a matter of determining the most suitable concentrations for different purposes.

Quantitative Relationship between Antigen Dose and Antibody Production.—Edgar T. H. Tsen (*Journal of Medical Research*, January, 1918) was unable to confirm the observations of Smith and Brooks, made in 1912, as the experiments here reported seem to show no quantitative relationship between the antigen dose and antibody production. Tsen finds that no more antibody can be produced by large than by small amounts of the antigen. In active immunization he recommends small doses, saying that they are just as efficient as, and sometimes even better than, large doses. The rapid method of producing antibodies (injection on three successive days) gives as satisfactory results, but not better ones, than the slower method of five-day intervals between injection.

Infantile Paralysis, Animal Distemper, and Its Related Diseases.—Leverett Dale Bristol (*Journal of Medical Research*, January, 1918) discusses some suggestive epidemiological, pathological, and clinical characteristics common to animal distemper and its related diseases, and human infantile paralysis, and points out the similarity of these diseases as regards distribution, occurrence, seasonal prevalence, probable mode of transmission, the effect of cold weather on epidemics, age of classes affected, locality incidence, type of disease, paralytic symptoms and nature of other symptoms, incubation period, pathological anatomy, parts affected by paralysis, etc. He believes that the organism of poliomyelitis is a pleomorphic bacillus, and that it may be closely related to the so-called bipolar bacilli, or Pasteurella of Lignière, and further, that infantile paralysis may be nothing more than a common, widespread human Pasteurellosis.

Diagnosis of Stones in Bile Ducts.—Golder Lewis McWhorter (*Journal A. M. A.*, March 16, 1918) advocates the use of the wax tipped bougie or sound for the diagnosis of the presence of stones in the several parts of the bile ducts, largely on the strength of the frequency with which stones may be overlooked in the hepatic, and to a lesser extent, even in the common duct. From one half to one part of sterilized olive oil should be mixed with one part of dental wax and the tip of a whalebone filiform bougie or metal probe is dipped in the molten mixture. The drop on the tip soon hardens and should be carefully examined with a hand lens to be sure that its surface is smooth. The tip should then be passed through the common duct and ampulla of Vater, removed, dipped in cold water and again examined with the lens. If there are no scratches it should next be passed up into the hepatic duct and its right and left branches, after they have been explored with a scoop to remove any loose stones which might be pushed up by the tip. For the sake of more accurate localization the wax may be applied in a series of rings and the number of rings scratched will indicate the depth of the stone. If a jump is felt during the passage of the tip it should be drawn back and forth several times over the point to increase the likelihood of obtaining a definite scratch from an ensacculated stone.

Proceedings of National and Local Societies

NEW YORK NEUROLOGICAL SOCIETY.

Regular Meeting of the Society, in Conjunction with the Section in Neurology, Academy of Medicine, November 13, 1917.

The President, Dr. FREDERICK THURNE, in the Chair.

Exhaustion Pseudoparesis; a Fatigue Syndrome Simulating Early Paresis Developing under Intensive Military Training.—Dr. J. RAMSAY HUNT presented a resume of the results of special neuropsychiatric examinations in one of the large training camps for officers, composed of 1,500 men, and out of this number eleven cases were found presenting slight but definite symptoms of incipient paresis, preparesis, or early cerebral syphilis, a diagnosis confirmed by examinations of the blood and cerebrospinal fluid. Generally speaking the clinical symptoms were not very marked, consisting of pupillary changes, tremors of the face and hands, and slight disturbances of articulation on repeating test phrases. The usual cerebral symptoms or evidence of mental deterioration were so slight as to be practically negligible from the diagnostic standpoint, and in studying this very important group of cases the examiner was almost wholly dependent upon those silent but well established somatic symptoms of early paresis so characteristic to the trained observer; e. g., tremors, absent or feeble reactions to light and disorders of articulation of the paretic type.

As directly bearing on this subject, emphasis was laid on the occurrence of another group of cases which had come under observation, the formal recognition of which was of importance because of the close similarity of the somatic symptoms to those of early paresis. This condition was apparently dependent upon an exhaustion of the cerebrospinal centres as result of the unusual strain, both mental and physical, to which men undergoing the intensive course of military training were subjected. Four cases were reported in detail, presenting slight mental and cerebral disturbances, inequality of the pupils, with extremely feeble and sluggish reactions to light, coarse tremors of the hands, face and tongue and a dysarthric disturbance of speech on repeating test phrases very similar to that observed in the early stage of paresis. The pupils in all of the cases were unequal and showed a very feeble and sluggish reaction to light. In some of the cases there was so little response as to suggest a true loss of the light reaction. The reaction on accommodation was preserved and the sympathetic response was also elicitable; the impression of an Argyll-Robertson pupil was, therefore, produced. The tremors of the face and tongue were coarse, with associated movements of the facial muscles on speaking. In addition, fairly coarse tremors of the hands and fingers, and handwriting was tremulous. Syllable stuttering and the dysarthric speech of paresis were closely simulated.

Clinically, the diagnosis of incipient paresis seemed assured, but the serological examinations of the blood and spinal fluid were entirely negative.

There was no increase of globulin or cells, and the colloidal gold reaction was negative. Furthermore, all the symptoms cleared up after a week or ten days' rest. In the absence, therefore, of positive findings in the blood and spinal fluid and the rapid improvement under rest, it seemed clear the condition had been produced by an acute exhaustion of the central nervous system, with somatic symptoms strongly suggestive of early paresis.

As there was association between fatigue and the production of certain toxins which act upon the central nervous system as well as upon the muscles, in addition to the theory of nerve exhaustion, a low-grade intoxication of the nerve centres had to be considered as a possible explanation. Among these toxic products of fatigue might be mentioned such substances as carbon dioxide, paralactic acid and monopotassium phosphate. Some observers, notably Weichardt, had also long maintained that a specific fatigue intoxication existed, and was the essential etiological factor in the production of its characteristic manifestations.

Among the recognized mental symptoms of fatigue was a diminished power of attention, a lack of ability to concentrate, a slow reaction to mental stimuli, slowness in reasoning, as well as errors and slowness in mathematical calculation. If these symptoms were present in any marked degree and associated with the somatic symptoms mentioned above, they might well lead to error.

It was well known that fatigue was a frequent cause of tremor, and tremor after prolonged muscular activity was well recognized. The unusual degree, wide distribution and persistence of it in these fatigue cases were probably dependent upon the prolonged mental and physical strain and a special disposition to exhaustibility of the nerve centres.

As the mechanism of speech required a delicate coordination of the higher cortical centres and muscular activity, it was perhaps not surprising that the disturbance of articulation noted in this group of cases should have occurred as a manifestation of extreme fatigue.

More difficult of explanation were the pupillary phenomena. It was well known that during the convulsive crises of epilepsy, and even hysteria, the pupils dilated and were rigid to light. Also, in simple exhaustion, the pupils were dilated and might be sluggish to light, with reservation of the reaction on accommodation. Perhaps the suspicious pupillary phenomena observed in these exhaustion cases were of a somewhat similar nature, possibly dependent upon a disturbance of the sympathetic innervation of the pupil by the action of the toxins of fatigue. The pupils, while definitely unequal, with sluggish or absent reaction to light, presented no irregularities of contour, and this might constitute an important point of difference from the true syphilitic pupil which not infrequently displayed marginal irregularities.

Dr. Hunt stated that he had not observed a similar condition in civil practice, which he ascribed to

the unusual etiological conditions furnished by life in a training camp, and thought that the formal recognition of a *fatigue syndrome simulating early paresis* was worthy of earnest consideration. Furthermore, it was not unlikely that under still greater conditions of stress and strain this group might be the forerunner of more severe types of the exhaustion neuroses and neuropsychoses.

Neurology and Psychiatry in the Army.—Major THOMAS W. SALMON, M. D., M. R. C., gave an account of the work which had been done in neurology and psychiatry in the army and that which was being planned, giving illustrations to show the great importance of mental diseases in military life and the formidable new medicomilitary problems created by the extraordinary prevalence of the psychoneuroses in the present war.

The lessons to be learned from this prevalence in armies had not been wasted, as Surgeon General Gorgas had made appropriations even before the participation of the United States in the war to organize neurological and psychiatric work in the army upon a scale not previously attempted. Greatly helped by the cooperation of the National Committee for Mental Hygiene, the American Medico-Psychological Association and the American Neurological Society, all of which had appointed war work committees, no less than 222 specialists in nervous and mental diseases had been commissioned by the Medical Reserve Corps.

Their first duty was with candidates for commission and with recruits. Medical officers in this special work were stationed at all officers' training camps and conducted complete examinations of all candidates, with the result that many cases of organic nervous disease and some of psychoses and psychoneuroses had been rejected for disability. Each of the National Army cantonment camps now had a neuropsychiatric board of three medical officers who examined cases referred to them by line and medical officers and were now commencing to make a systematic examination of all civilians under training. This would result in a great decrease in the number of cases to be returned from the Expeditionary Forces. Already several thousand men had been rejected for mental and nervous diseases, among these being nearly all the psychoses, mental deficiency, even cases of imbecility, and a striking number of epileptics. The presence of these medical officers in the camps tended to prevent the simulation of mental diseases.

Seven specialists were in England gaining experience in the most approved methods of treating "shell shock"; several others were in France with the Expeditionary Forces, and one was attached to each base hospital sent abroad; one was also attached to each military prison, and, when delinquency battalions were formed, one specialist would be attached to each. A number of medical officers entering the service had acquired some special training. Neurologists had desired to get some psychiatric work and psychiatrists had felt that they should brush up in organic neurology. This need had been met by detailing a number to intensive courses in neurology and psychiatry.

Major Salmon described briefly the arrangements to be made for the care of cases of functional ner-

vous diseases in the Expeditionary Forces and those likely to be returned for those causes. By permission of the Surgeon General he announced the first military psychiatric hospital in the United States was about to be opened at Fort Porter, Buffalo, and that others would be provided as need arose. A special neuropsychiatric base hospital had been established for Expeditionary Forces and would probably leave the country in a short time. In this hospital the entire personnel of 216 individuals consisted of trained physicians, nurses, and other workers who had had actual experience in the care of mental and nervous diseases.

In closing, Major Salmon directed attention to the influence which this work in the army would have upon the extension of psychiatry and neurology in civil life after the war.

Neurological and Mental Examination of State Troops of the National Guard.—Major GRAEME M. HAMMOND, M. D., M. R. C., gave a general review of the work he had been doing in examination of the troops of the National Guard in this city and at the camps. When he received orders in August from the Surgeon General to examine all the militia in the vicinity of New York City, he was at first unprepared to act, for he realized his own efforts could be so small in such a tremendous task. So he enlisted the interest and assistance of twelve able neurologists and psychiatrists who agreed to help him in the work and they formed themselves into an examining board.

The troops were scattered throughout the armories here and in camps in the Bronx and Van Cortlandt Park, but the work was started, beginning with one regiment. The army surgeons with the troops could give little information as to the mental soundness of the men, though they knew all about their physical condition, but it was soon discovered that the non-commissioned officers could give a certain amount of such information, so these men, usually sergeants, were asked to make lists of the men whom they believed would not make good soldiers. That helped a great deal. Soon experience showed that many of the candidates could be passed at a glance on the appearance they presented, but others were given a more careful examination. The intention was to dispose of those who would not make good soldiers, who would not obey orders, or who could not understand them, those with no idea of discipline, those with organic disease of the nervous system, and the mentally unstable cases. Certain regiments were found to have higher types of men than others; very few were rejected from some regiments, but in one, from a distant part of the country, sixty-three per cent. were rejected. After the Rainbow Division left, nearly 40,000 men had been through this examination.

At the camps the work was not easy, for large numbers had to be examined in a day, though some of these men were of an exceedingly high class and one had no difficulty in deciding that they were all right. But some were delinquents, though not mental defectives; others were manic depressives; there were cases of dementia precox, epilepsy, and migraine, a few spinal cases, some of progressive muscular atrophy, though only one of cerebrospinal syphilis. No cases of tabes were seen. In some

regiments there were many cases of goitre, a few of them exophthalmic, but unless they presented constitutional symptoms they had not been rejected; only when they showed evidence of tremor or of physical weakness so that they could not keep up with their work, were they considered unfit for duty.

One could hardly realize the amount of work this meant. The large number of men that had to be rejected had proven a revelation. The army was full of incompetents who should have been stopped before they entered if the men on the exemption boards had done their duty, and it was deeply to be regretted that such a state of affairs should exist in this age and at this crisis. In the officers' training camp there were many whom it was found necessary to reject, men of the highest type, college men, and those who had held important positions, men of affairs. Those from the West compared very favorably with those from New York State, but in one regiment of men from a large city, many of the men had been in jail or a reformatory. The cases of migraine were of interest, mostly all giving a significant family history, usually the mother having suffered from it. Those who had slight attacks were passed, but those in whom the attacks lasted two or three days accompanied by severe pain and prostration, were rejected. Epileptics were not rejected unless they were seen during a seizure by a member of the Board, or by some one on whose testimony the Board could rely. A proportion of those would probably be heard from later. There was no doubt that a certain number of cases of all kinds that should have been rejected got through. In recognition of the Surgeon General's opinion that such men were not desirable, they had been careful in going over the neurasthenics and those with hysteria.

As far as the militia, the volunteer, regiments were concerned, they would undoubtedly prove a high type of soldier, but in regard to the National Army as a whole one could not be so enthusiastic. In one day seventeen men were dismissed from the service who had been under observation in the Psychiatric Hospital at one camp for a number of days. This was where the heroine cases were seen, some of them coming in voluntarily because they could not obtain the drug and others sent in by the commander. It was a matter of astonishment how frequently these men were secretly supplied with this substance by visiting friends and relatives. Of the seventeen rejected men referred to, four were cases of dementia precox, four epileptics, eight heroine habits, and one was undiagnosed.

Dr. BERNARD SACHS, referring to the number of uniformed commissioned officers present in the audience, expressed the hope that a civilian's opinion was still of value, particularly as some of the civilians, like himself, remained such, not from choice, but because of age limitations. It was a source of satisfaction to hear from Major Salmon that there was work for all neurologists and psychiatrists, he himself believing there would yet be a good deal more for them to do in New York alone and he knew they were all anxious to do what they could for the Government.

So far as a neurological and psychiatric program

was concerned, the one part that needed discussion was the manner in which those selected for the work were to be prepared to meet the huge preponderance of war neuroses. From all accounts of the various armies in Europe, these conditions presented a large number of peculiar and interesting problems. The opportunity for study was better than any which Charcot's clinic presented thirty-five years ago; yet, though more intense today, they would find difficulties presenting many of the same characteristics as in those far off days.

The speaker's own point of view regarding the attempt to educate some of the members of the Medical Reserve Corps in neurology and psychiatry was that in order to appreciate the importance and peculiarities of the neuroses, it was necessary they should have proper training in organic nervous diseases or they would regard every manifestation of nervous involvement as a neurosis and perhaps many serious organic troubles would not be recognized. It would be deplorable for the neurologist not to recognize the early onset of tabes or general paresis, particularly in those cases returned from the battle line after injury. For instance, he might diagnose purely functional paralysis instead of a myelitis.

Dr. Hunt's presentation had brought up that very point. He spoke of his cases as exhaustion pseudoparesis, which diagnosis might be accepted for the time being. But nevertheless, these cases showed the extreme importance of being able to exclude the presence of cerebrosplinal involvement which later on would develop into true paresis or pseudoparesis luetica. They showed so many of the symptoms of early onset that in spite of the fact that they did not present the physical characteristics of increase of cells and positive Wassermann, one might well hesitate to say they were not marked for paresis. After all, nothing more had happened in those cases than had happened in dozens in civil life when, under emotional strain, the symptoms of general paresis first appeared. Under camp conditions, the mental and nervous strain had been unusual, the physical strain great, and so the lack of resistance was first made evident. Such men should not be returned at once to military life, even though the symptoms disappeared after a week. They should be exempted from the army for seven or eight months, or even a year, and kept under observation; if they then showed no return of the symptoms they could be returned to the army.

As regarded the aftercare of cases of neuroses arriving here, that would be a matter in which all took an interest. One of the points noted abroad was the great improvement that appeared when treatment was undertaken as early as possible and as near as possible to the battle line, which showed that the greater stimulus of the desire to return to the fight was a helpful factor.

Of all points covered by the papers of the evening, the one which the speaker wished to emphasize was this: Every possible opportunity should be taken and use made of opportunities to equip the men who were going to see these neuroses with as thorough a knowledge as possible of organic nervous diseases. Once the men were able to discriminate between organic and functional disease they

would advance their studies of the neuroses still further and acquire an insight into war neuroses and "shell shock" which would lead to a better knowledge of what was today a most puzzling condition.

Dr. M. ALLEN STARR felt he echoed the sentiments of the audience in expressing indebtedness to Major Salmon and Major Hammond for the information they had given of what the army was actually doing in the work of examining the soldiers. It seemed appalling in its extent; this examination of one or two million men! It was a tremendous feat and probably every physician sooner or later would be called upon to share the work.

From the beginning, the speaker had been of the opinion that it was a mistake on the part of the medical authorities in the army to reject the services of men who were competent to make examinations, but who were unwilling or unable to give their whole time to it; but it was probable that a part-time service was destined to come to every one, and there was no doubt that all would be ready to give that part-time service when occasion required. The occasion would probably arrive as soon as the soldiers came back wounded and invalidated from the front. The situation at present in New York was an evidence. Recently, at one of the base hospitals in America, the speaker met one of his former students in charge there who said they had seven or eight cases they did not know what to do with, because of the difficulty of deciding if the diagnosis should be organic or functional. None of the physicians in charge was really qualified to pass a psychiatric opinion and they were anxious for advice. Now, giving such advice was the kind of part-time service many could readily render; they had been doing it all their professional lives in hospitals, and why should it not be done for the army?

It was a difficult matter to eliminate the neurosthenic. The speaker had in mind three individuals who had slipped through into the training camps; they had been privately recommended to leave, but had refused to do so because they were patriotic; they were in active service but actually incompetent as soldiers, all three being cases of dementia precox, one the son of a dementia precox and a replica of his father, yet he had slipped through three different examinations, deceiving one of the best examiners on the Board of Mental Hygiene. He was incompetent and would show it in any emergency or under excitement. Yet many like him had passed through; they were in the opposite class to malingerers, yet it was equally important to detect them and the army examiners should be on the lookout for that type. The percentage was interesting. Statistics of the first eighteen months of the war in Germany showed there were three and a half per cent. rejections in one division alone, near Hamburg, which showed the Germans were as badly off as the English in the numbers they had to release from the service. The average in the American army would probably be higher, for the usual class in the College of Physicians and Surgeons numbered about 120, and in each there were usually three men suffering from neurosthenia or dementia precox. This was nearly three per cent., a good example of what existed in the

community. A large number of these men would be found to be incompetent in the army and it was the business of some one to weed them out as fast as possible. The point Doctor Sachs made seemed to be valid, that it was important to educate the medical personnel and impress on these young men the great incidence of functional nervous disease and the importance of differentiating it from organic nervous disease.

When the time came for the establishment of the new hospitals Doctor Salmon spoke of, it was to be hoped the men would be made use of who had kept abreast of what had been learned up to the present time about "shell shock." In connection with the study of war neuroses, to be conducted by the new committee for this purpose that Doctor Tilney had just appointed, a mass of accurate information would be gathered in available form which would be of infinite service in dealing with these cases when they returned from the front.

Dr. EDWARD D. FISHER thought that possibly too much weight was put on neurasthenia; when the men were on active service this would largely disappear. He agreed with Doctor Sachs that the distinction between organic and functional diseases must be carefully made and on the importance of the examining physicians being thoroughly trained.

Dr. L. PIERCE CLARK wished to emphasize only one point: To exclude these neuroses from the organic group was not sufficient training for the men entering into this work. In addition to having an organic understanding they should have psychiatric training and a modern conception of the functional neuroses. He was glad to know that the men weak in either qualification were being sent to appropriate places, so this lack could be made good before they actually engaged in the work.

Dr. JOHN T. MACCUBDY was particularly interested in Doctor Hunt's paper. It would be safe to exclude these cases from the group of true paretics. It was not impossible that the war would furnish groups of cases from the mental standpoint very like paresis. In London he had occasion to examine a case following concussion; the most striking thing was not only his intellectual defect, but he was without insight into his true condition and showed the type of carelessness one saw in paretics. If there had been no history of concussion and without the negative serological findings, the institutional examination would have resulted in a diagnosis of paresis.

Dr. J. RAMSAY HUNT felt he must reply to Doctor Sachs. He could understand that a critical attitude might be assumed toward the possible parietic features of these exhaustion cases. It had not seemed possible, however, that any clinician of experience could possibly regard them as true cases of paresis in view of the normal serology and subsequent course.

The point he emphasized was the existence of a group of cases developing under intensive military training, with pathological pupillary response to light, coarse tremors of the face, tongue, and hands, and a slight dysarthria closely simulating that of early paresis. He had tried to make clear that the mental and general cerebral symptoms were not characteristic of paresis, but, in conjunction with the somatic symptoms, were suggestive and corroborative. Fur-

thermore, the disappearance of all symptoms, general cerebral, mental, and somatic, after a period of rest, and the normal serological findings, left no other interpretation than that of fatigue or exhaustion of the central nervous system.

He would repeat that he had never encountered the condition reported in civil life, and any importance or significance which attached to this fatigue syndrome was, he thought, limited to the exigencies of military life. He thought it not unlikely that cases of this description which showed thus early a tendency to exhaustibility of the sensory nervous system, might be the type of case which later, under greater provocation of stress and strain, might pass into the more severe neuroses or neuropsychoses of war.

These men were not recommended for discharge, because they were quite willing to resign voluntarily from the camp, realizing from experience that they were unfitted for the mental and physical strain of the life. Under conditions where the candidate was unwilling to resign and yet presented such a striking picture of fatigue, the question of the recommendation for discharge would have to be settled on the individual merits of each case.

Letters to the Editors.

DRUG CONTROL.

To the Editors:

NEW YORK, April 15, 1918.

Unless Governor Whitman vetoes the bill for drug control now before him the prescribing and dispensing of opium by physicians in this state will hereafter be regulated by a "Drug Commission," a form of supervision that has been found necessary by the state for the control of prize fighting, race track gambling, and vice, and including that of the "looted" public utilities created under charter by the state. It has been said of these that none of them were ever previously picked so bare but what their regulation under expert management could be made to afford a return in place, power, and emoluments by those entrusted with this duty.

Two years ago, when the amendments to the Boyland law suggested Mr Charles B. Towns were defeated, the Whitney Drug Commission was appointed to study the problem of drug addiction before the passage of any further legislation on this subject, one result of this investigation being the elimination as factors in drug legislation of all those professing to have a medical cure for the drug habit. Unfortunately their place has not been taken by those physicians who proved to the committee that drug addiction is neither crime nor vice, but in all probability a disease for which we have as yet neither a specific cure nor a routine method of treatment. Instead, this duty has been taken over according to the protested statement of an assistant district attorney of this city by the New York state magistrates and the New York City Committee on Drug Evil. This has the further endorsement, according to the same authority of a late detective in the police department, as "the most perfect system for the control of narcotics that could be devised." It is a matter of common knowledge that the most active member of the city magistrate committee is Judge Cornelius J. Collins, whose attitude on the responsibility of the doctors and the druggists for the spread of the drug habit even to that of taking the place of the drug, was publicly expressed before the Whitney Commission at a hearing in this city. It was Judge Collins also before whom a Brooklyn physician was convicted of a violation of the present law in failing to keep a record of the small amount of morphine personally administered in the course of his practice, an offense that could be proved against ninety per cent. of physicians in active general practice at any time they might be haled

to court. As a legislative bill following a two years' investigation at a considerable outlay by the state and providing for a new important state department with a commissioner, deputy commissioners, counsel, secretary and numerous employees this measure was assured an easy passage through both bodies of the legislature.

It is unfortunate that it was not "whipped into shape" after a two years' study, which embraced two tours of the principal cities of the state, hearings that were of the most sensational character, until just before the last days of the session of the legislature. On this account those who might have asked for a hearing were unable to do so. Their only hope now lies with an appeal to the Governor which has been made for this purpose. How little the details of the bill were known to the officials of the state and county societies may be learned from the fact that none of them had read this bill up to the time that it was passed. All this responsibility had been left to the chairmen of the legislative committee of the state societies and of the Medical Society of the County of New York. Unless they have registered a protest, this duty will be left to the officials of the various other county societies of this state. This action should be assured once they are made familiar with the astounding provisions of the bill. A united action on their part, such as was witnessed with good effect in this respect in the bill for compulsory health insurance, should give pause to the passage of a measure unconstitutionally controlling the practice of medicine as a police measure in the State of New York.

JOHN P. DAVIN, M. D.

COMPULSORY HEALTH INSURANCE.

To the Editors:

NEW YORK, April 15, 1918.

Health insurance is undoubtedly one of the most important problems that confronts the medical profession today. It is the consensus of opinion that there is a most urgent need for the extension of the intelligent and effective medical care and treatment of the wage earning class of this community, of the necessity of placing the greatest possible emphasis upon precautionary measures in the prevention of the spread of disease. Modern health work is based upon this fundamental principle.

Now, this health insurance bill treats of preventive treatment as a secondary consideration and merely furnishes a measure of supposed relief and practically no prevention. From a public health standpoint, this bill is objectionable because it fails to provide properly for the prevention of the spread of disease. The administration of this law is vested in the Industrial Commission of the State. The health insurance bill adds to the enormous powers already vested in the commission in other fields, and in order to administer the provisions of the Nicoll bill, it is authorized to create a bureau of health insurance with competent medical direction.

The wide field of regulation opened under the provision of this bill demands that the administrative functions involving vast discretionary features should be vested exclusively in a particular body. Such a body should not be burdened with other problems, no matter how closely allied such problems might be with the principles involved in the measure under consideration. Under these circumstances, this feature of the bill is objectionable.

There is an absolute disregard in the proposed measure of the rights of the medical profession. Public health work in all its branches is dependent to a great extent upon the cooperation of practitioners. The solution of health problems lies with physicians, and without their aid and cooperation the problems which confront that branch of the government which is intrusted with the care and promotion of health and the prevention of the spread of disease will never be solved. The practice of medicine is a profession and not a commercial affair. It does not provide a commodity to be weighed, measured, or sold, but furnishes a service invaluable and measured by the conscience of the physician; but what consideration is given, under the provisions of the measure under discussion to the medical profession? It makes the profession a business, because it places a premium upon the number of patients an individual physician can handle. It subor-

dinates his technical experience, training, and judgment to that of laymen, by failing to provide proper representation in the administrative branch charged with the enforcement of its provisions. It will, inevitably, result in the lowering of the high standards which govern the professional work of physicians.

The conditions created by the terms of this measure will tend to promote compromising with conscience, and by placing a premium upon the number of patients attended, have a tendency to break down the high ideals which govern the conscience of a reputable physician.

Is it better for a patient to have competent medical services within his means of payment, or to have indifferent medical care though considered free?

I am thoroughly convinced that it would be a serious mistake for the legislature to consider the passage of this most drastic health insurance bill, and I desire to register my disapproval of the provisions of this measure on the grounds that the objectionable features mentioned are of such vital weight and importance as to overbalance some of its commendable ones.

J. LEWIS AMSTER.

DEPARTMENT OF HEALTH, CITY OF NEW YORK.

URGENT NEED OF MEDICAL OFFICERS.

OFFICE OF THE SURGEON GENERAL, April 8, 1918.

To the Editors:

I wish to call the attention of the profession at large to the urgent need of additional medical officers. As the war progresses the need becomes each day more and more apparent. Although the medical profession of the country has responded as no other profession has, future response must be greater and greater. The department has almost reached the limit of medical officers available for assignment. I am, therefore, appealing to you to bring to the attention of the profession at large the necessity for additional volunteers. So far the United States has been involved only in the preparatory phase of this war. We are now about to enter upon the active or the fighting phase, a phase which will make enormous demands upon the resources of the country. The conservation of these resources, especially that of man power, depends entirely upon an adequate medical service. The morning papers publish a statement that by the end of the year a million and a half men will be in France. Fifteen thousand medical officers will be required for that army alone. There are today on active duty 15,174 officers of the Medical Reserve Corps.

Within the next two or three months the second draft will be made, to be followed by other drafts, each of which will require its proportionate number of medical officers. There are at this time on the available list of the Reserve Corps an insufficient number of officers to meet the demands. I cannot emphasize too strongly the supreme demand for medical officers. Will you give the department your assistance in obtaining these? It is not now a question of a few hundred medical men volunteering for service, but a question of the mobilization of the profession that in the large centres of population and at other convenient points as well as at all army camps and cantonments, boards of officers have been convened for the purpose of examining candidates for commission in the Medical Reserve Corps of the Army. An applicant for the Reserve should apply to the board nearest his home.

The requirements for commission in the Medical Reserve Corps are that the applicant be a male citizen of the United States, a graduate of a reputable school of medicine authorized to confer the degree of M. D., between the ages of twenty-two and fifty-five years of age, and professionally, morally, and physically qualified for service.

With deep appreciation of any service you may be able to render the department, I am,

W. C. GORGAS,
Surgeon General U. S. Army.

Dr. Samuel A. Tucker, of Columbia University; Dr. H. R. Moody, of the College of the City of New York, and J. M. Moorehead, of Chicago, have been added to the personnel of the chemical section of the War Industries Board.

Book Reviews.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

Lecture on Medicine. A Handbook for Nurses. By CHALMERS WATSON, M. D., F. R. C. P., Lecturer on Clinical Medicine, Edinburgh University; Senior Assistant Physician, Royal Infirmary, Edinburgh. New York:

William Wood & Co., 1918. Pp. viii-295. (Price \$1.75.) Most manuals of medicine designed for the use of nurses follow along fairly well defined lines and aim to set forth the most important features of the symptomatology and treatment of the commoner diseases. The present volume is quite a radical departure, for it consists of a series of clinical lectures and case records dealing with only a limited number of subjects. The presentation is chiefly a clinical one with an idea of broadening the nurse's knowledge of medicine and thereby making her a more competent and intelligent aid to the physician. The aim is well carried out and the book should prove quite useful as collateral reading in the latter months of hospital training, but it could not be regarded as in any sense a textbook of medicine. Perhaps the most valuable chapter in the book is the final one dealing with the subject of diet and the principles of feeding. This is fairly extensive and contains many useful receipts for the sick room. Taken in all, the book is a good one as a supplementary volume and can be commended for the clearness of its presentation.

Births, Marriages, and Deaths.

Married.

PARDEE-PORTER.—In Hewlett, Long Island, on Monday, April 15th, Captain Harold E. B. Pardee, M. R. C., U. S. Army, and Miss Dorothy Dwight Porter.

Died.

BAST.—In Brooklyn, N. Y., on Friday, March 22d, Dr. Oscar August Bast, aged thirty-five years.

CALDWELL.—In West Chester, Ia., on Thursday, March 21st, Dr. Edward James Caldwell, aged forty-five years.

DUNN.—In Boston, Mass., on Thursday, March 28th, Dr. William Aloysius Dunn, aged sixty-four years.

GLIDDEN.—In Holly, N. Y., on Monday, March 25th, Dr. Charles Harvey Glidden, aged sixty-one years.

EYNOY.—In New York, N. Y., on Sunday, March 24th, Dr. William G. Eynoy, aged sixty-three years.

GREENSLADE.—In Lima, Ohio, on Thursday, March 21st, Dr. James Molland Greenslade, aged sixty-five years.

JOYCE.—In Buffalo, Tex., on Saturday, March 23d, Dr. John Henry Joyce, aged sixty-three years.

KISTLER.—In Kansas City, Mo., on Saturday, March 23d, Dr. Robert Kistler, aged sixty-three years.

LANTZ.—In Alaska, W. Va., on Saturday, March 23d, Dr. Percival Lantz, aged forty-six years.

LOCKHART.—In Chicago, Ill., on Friday, March 22d, Dr. Theron Dickey Lockhart, aged forty-five years.

MCCOY.—In Bozeman, Mont., on Friday, March 22d, Dr. Columbus E. McCoy, aged forty-six years.

O'BRYAN.—In Fort Snelling, Minn., on Wednesday, April 3d, Captain Harry James O'Bryan, M. C., United States Army, Minnesota National Guard, of Watertown, S. D., aged forty-nine years.

OFFUT.—In Greensburg, Pa., on Monday, March 25th, Dr. Lemuel Offut, aged sixty-six years.

REYER.—In Indianapolis, Ind., on Sunday, March 24th, Dr. Ernest Charles Reyer, aged fifty-three years.

SHEDD.—In Conway, N. H., on Thursday, March 21st, Dr. George Hosley Shedd, aged sixty-five years.

SILVERMAN.—In Brooklyn, N. Y., on Saturday, April 13th, Dr. Robert Shields Stedman, aged seventy-six years.

TANNER.—In Brooklyn, Conn., on Friday, March 22d, Dr. Alfred H. Tanner, aged sixty-six years.

TEN EYCK.—In New York, N. Y., on Friday, March 29th, Dr. George Scribner Ten Eyck, aged thirty-seven years.

WALKER.—In Denver, Colo., on Thursday, March 21st, Dr. Rolandus G. Walker, aged fifty years.

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Original Communications

THE LIBERTY LOAN AND THE DOCTOR

By ABRAHAM JACOBI, M.D., LL.D.

New York

The medical profession of the United States has responded to the call for volunteers in the army in a way that must be a source of pride to every American doctor. Moreover, large numbers have served without remuneration on the Exemption Boards and the Medical Advisory Boards, yet, so accustomed is the public to the unselfish rendering of public service by the medical profession that all this has been taken as a matter of course. Those who have not joined the army are called upon to fill the places of those who have left, both in the hospital and in private practice, so, even those who have not entered the army are serving their country. Indeed, many who stay at home do so most unwillingly, longing for the opportunity to take a part in the great adventure upon which we are embarked. Quite as much heroism is required of the man who realizes that his greater obligation requires him to stay at home and carry on the drudgery of his professional life as of him who goes.

We who stay at home because of age, infirmity or obligations, can do even more than give our services to replace those of the men who have gone to the front. We can lend our money so that there may be no lack of material to prosecute this war for the good of the world or to give to the sick and wounded the very best care that skilled attendance and an unlimited purse can make possible. Therefore an appeal is made to the doctors to buy Liberty Bonds. This appeal is not urged too strongly on the doctors by the liberty loan committee, for they have said the medical profession have done so much for the cause that they feel almost abashed to ask them for money in addition to services rendered. For this reason there have been no organized campaigns for subscriptions. The committee feel that the same high standards of duty which have sent so many men to the front will induce those who stay at home to do their share in the support of the Third Liberty Loan without any urging.

As one of the revolutionists of 1848, one of those who hoped to bring about the destruction of autocracy and the establishment of democracy in Germany seventy years ago, this great world war makes a specially powerful appeal to me. When I recall all those brilliant, unselfish, patriotic youths who

gave up their lives for their country in the futile effort to overthrow Prussian militarism at that time, I wish that Carl Schurz and hundreds of others might have lived, as I still hope to live, to see Prussian militarism and hypocrisy stamped out once for all, even though it has spread and grown in strength for full seventy years.

Long live my country and yours! Long live America!

THREE THINGS LIBERTY BONDS CAN DO

By ROBERT T. MORRIS, M. D.,

New York.

Doctors devote themselves to studying methods of saving life, military men to studying of those for destroying it. One of these groups is more valuable to the species *homo* than the other. Life saving on the part of doctors at the present moment includes that larger vista which opens past the sick room, past the hospital, past the front line trenches and out into the broad horizon of opportunity to smother an epidemic of militarism, or at least to lend a strong hand toward so doing. We can do that now by reaching down into the right hand pocket and getting something to exchange for Liberty Bonds by which we accomplish three things: life is saved through a speedier ending of the war, first rate interest is earned upon a secure investment, and the Potsdam gang is taught something. By the way, the title of "doctor" meaning "teacher," may we not volunteer some professional information to the entire Prussian military group; Germans being notably fond of learning? Let us critically examine the warfare question in a search for fundamentals. The lesson will be chiefly biologic and we may systematize it briefly as follows:

Man when engaged in warfare is killing his own species. Predatory animals prey upon other species and not upon their own kind. Man therefore appears to be acting abnormally in relation to nature's rule.

We may assume that man's mind works abnormally in order to correspond to a body working abnormally, because man's anatomy is not adapted to the erect posture. He apparently went all wrong when arising upon his hind legs. Structure and function are closely allied. Psychologists tell us that seven tenths of all human action is based upon misconception. An old cat with proper an-

atomy incidentally has nearly one hundred per cent. of correct views. He makes almost no mistakes. Every man promptly resents the idea that his own views average only three tenths right and that the rest are based upon misconception. The only way for a man to check up this question in a scientific way quantitatively is to write down the names of ten personal friends and then note the extent to which their actions in daily life are influenced by misconception.

Men manage to get on fairly well notwithstanding their anatomic and mental handicaps, under various kinds of government, but under no form are the real people fully represented. The reason for that is because in the course of action based upon misconception politicians are allowed to have their way and to secure control of the machinery of government to a greater or lesser degree. The politician represents a type of mind quite as distinct as that of the mathematician or of the poet, and he will run along his own lines of action just as naturally as the mathematician or the poet run along theirs. The type politician is ready at any moment to sacrifice almost anything in the interest of his clan. Even in patriotic France, Bolo Pasha and his little circle of statesmen were ready to sacrifice France in their own selfish interest. Until the politician is studied by the psychologist as a natural history specimen is studied, he will be allowed to go his way as before, followed by disaster. Warfare is not precipitated by doctors, by engineers, or by astronomers. It is precipitated by politicians selfishly in the interest of the clan. The doctor as a public spirited citizen should look after the politician as he looks after scarlet fever. One country is as bad as another if not a little worse, not because of the real people in each country but because of their political masters. Why are the rulers of a country different from the typical people of their country? Why do the former so seldom represent that which the best people stand for? Here enters the working of a law well understood by plant breeders and animal breeders, the law of cultural limitations. Under a high degree of culture any variety of animal or plant reaches cultural limitations and then becomes decadent. Nations represent herds of primates under conditions of cultivation, and the governments which are in control by hereditary rulers are particularly menaced by politicians coming from families which have approached cultural limitations and therefore contain many defectives.

Kaiser Wilhelm has physical stigmata of decadence. He belongs among the defectives, and would be classed in that way in almost any psychopathic laboratory. He is versatile like many other criminals, but not more versatile than other Germans of my personal acquaintance who have not had a corps of paid publicity agents engaged in telling people about it. Grouped about the Kaiser are politicians who made their way toward him *secundum modum*. This group contains many defectives, morally and physically decadent, and upon them the German people placed all responsibility. It is a curious fact that the study of criminals has been carried on chiefly among the lower social classes, but the practical police in New York divide the public into two large groups, the captured and the uncaptured,

irrespective of social position. The reason why the Kaiser is a criminal of more desperate character than the ordinary burglar is because the ordinary burglar does not know that he must actually kill when engaged in robbery. The Kaiser knew in advance that homicide must be a necessary feature of that robbery which he as leader of the Potsdam gang had planned during a period of about forty years.

When some of our pioneers wished to obtain land belonging to the Indians and could do so only by breaking treaties, they were obliged to call politicians into council. Otherwise Boston would not have stood for activities at Mandan for example. The procedure followed was something like this:

A horse race would be arranged and the Indians allowed to win.

Exultant winners among the Indians were then charged with having stolen their fast horses. An indignant Indian would knock down a white man who had thus insulted him and the white man would shoot at the Indian "in self defense." A general mêlée would follow and United States troops would be called upon to quell "an Indian uprising." As a condition of peace the treaty with the Indians would be broken and some new arrangement more satisfactory to the politician would be made. And the reports sent from the West to the East for the purpose of calming the representative American people of the East were mendacious in character.

Bismarck in 1870 had to lie to the people before good Germans would allow him to commit homicide for purposes of robbery. The Potsdam gang in advance of the present war became very impatient over their difficulty in leading the Russians and French to make moves which would rock the representative German people in the belief that other nations were the aggressors. They were finally obliged to lie to the German people in order to be allowed to commit homicide freely for purposes of robbery. The best "colonies" for any country are those successful in trading; but what would be thought of a tradesman who proceeded upon the policy of killing off his customers? The wiser German people did not wish to kill off customers; it was the criminal defectives, entering so largely into the military group at Potsdam, who felt they were not receiving enough attention from the men who were winning the world for Germany through superior skill and intelligence. The Germans are temperamentally fond of working by authority, and the politicians led them to slaughter upon this altar furnished with an idea only. The naturalist knows that Darwin's law of mutual interdependence is the law of victory and the one which shows the way out of war. Potsdam politicians have cultivated the idea of Darwin's other principle, that of struggle to the point of killing because for their selfish purposes that was held to be a more practical principle than the one of mutual interdependence, one which really leads to the success of nations.

Germany, led to the politicians' altar, has now been slaughtered. With a cut throat she is floundering in death throes, devastating all civilization in her contortions. Let us put an end to the Beast quickly. Liberty Bonds buy chloroform.

610 MADISON AVENUE.

MORBID IMPULSES.*

Their Diagnostic Elements and Medicolegal Importance.

BY ALFRED GORDON, M. D.,
Philadelphia.

The study of morbid impulses is important because of the grave consequences to which they may lead from a social and medicolegal standpoint. Such a study presents many interesting features, first of which is the underlying basis upon which these morbid states develop. Since the time of Morel, the question of heredity began to play the most important rôle in the domain of mental pathology. It finds its corroboration in the study of Mendelian laws of heredity (1). Morbid impulses constitute episodic manifestations in the life of neuropathic individuals.

What is neuropathy? Under this term is understood a pathological state of an individual whose psychophysical resistance is constitutionally diminished; in other words, it is a condition which is a deviation from the normal type of humanity. In such a person there is an interruption of harmonious equilibrium existing between various functions of cerebrospinal centres; the cooperation and adaptation of the latter are incomplete. There is an ataxia of thought, sentiment, will, and psychomotor functions. According to the parts involved, these patients form several groups which are only apparently different from each other, but under which is hidden the same individuality, viz., the neuropath.

The most important characteristics in neuropathic individuals are found in their psychical sphere. The development of their intellectual faculties is irregular and there is a want of equilibrium in these faculties. Such individuals are only partial, incomplete beings. They may have a remarkable memory, but cannot fix their attention. Their mental instability is sometimes extreme. At the same time they may be apathetic and present paroxysms of great excitability. They may be eccentric, dreamers, with romantic tendencies. They are emotional, timid, extremely sensitive, impressionable, suspicious, egotistic, haughty, and may be affected with moral perversity of the gravest nature. Above all, the best illustration of the loss of psychical equilibrium is found in obsessions and morbid impulses. The latter is the consequence of the first.

What is an obsession? Normally an idea, a sentence, an image may unexpectedly invade our mind and persist obstinately. It is sufficient, then, to exercise our will to a certain extent and make this phenomenon disappear. This, so to speak, physiological obsession never leads to a morbid impulse. When a morbid obsession occurs, the cerebral centres are invaded by a certain image or idea which remains fixed and suppresses subsequently all antagonistic images or ideas. This is accomplished not without a struggle, but the tenacious idea is accompanied by a moral pain so intense that it subordinates the will, and the individual, perfectly conscious of what is going on, but powerless, finds himself irresistibly forced toward acts of which he himself

disapproves. The obsession leads to an impulse, and these two phenomena are in the same relationship as a thought to the act.

On the basis of our conception of the subconscious world the phenomenon under discussion finds an adequate explanation. The rôle of pathogenic forces in the causation of psychoneurotic manifestations is pretty well established. As the aim of this contribution is not the psychological aspect of the psychoneuroses, but their sociological value, the analysis of the mental processes and of the conflict between the conscious and subconscious ideas which leads to the formation of obsessions and other mental disorders characteristic of psychoneuroses, will be omitted.

The characteristic features of an obsession are therefore: 1, lucidity as to the phenomenon; 2, energetic struggle against the invaded thought; and 3, moral torture. The elements of morbid impulses are: 1, sudden function of a centre or of a group of isolated centres without participation of reason; 2, momentary impotence of will controlling the act. The state of consciousness, the apparent lucidity, is misleading for those who are not familiar with these disturbances and judiciary errors are readily explained.

Obsessions and morbid impulses may develop in a neuropath who becomes fatigued, whose nervous system becomes exhausted. Depressive emotion, prolonged intellectual effort, a prolonged waking state, excess of any sort, abundant hemorrhages, protracted infectious diseases, disturbance of nutrition, intoxication, especially alcoholic, the sight of a capital punishment, the news of a suicide or homicide, the recital of a murder, are all provoking causes of morbid impulses in a neuropathic individual.

CASE I.—A young woman, thirty-two years of age, who was previously neuropathic and whose hereditary history was the most unfavorable—father epileptic, mother alcoholic, a grandfather a paranoiac—had several miscarriages accompanied by tremendous losses of blood. Her recovery was protracted. Morbid impulses soon developed. Being a butcher's wife, she assisted him in cutting meat on the shop. On several occasions while handling the large knife she felt the desire to cut off the customers' heads. She realized her condition, struggled with herself, and resisted the torturing temptation. Finally once, in the presence of several customers, she began to scream; the knife fell out of her hands; trembling she begged them to remove the knife from her sight, as otherwise she would commit murder.

CASE II.—A woman, thirty-two years of age, who had been married for the last two years, had frequently the almost irresistible desire to commit suicide. He was fully conscious of his condition, fought it often at the expense of his sleep. Once riding on a boat, he felt the necessity of jumping overboard. Fearing himself, he begged the passengers to tie him to a post and keep him in this position until the boat landed.

Obsessions and irresistible impulses may cause also less important crimes. In kleptomania there is an irresistible impulse to possess objects which are of no value. This is frequently done by individuals who are otherwise perfectly honorable and possess sufficient means. Here, again, they are perfectly conscious of the criminality of the act and of the consequences to which it may lead. They struggle against this tendency, they suffer morally, but they finally succumb to the irresistible impulse. Arson,

*Read before the Medicolegal Society of Philadelphia, January 30, 1918.

assaults, rape, all varieties of sexual perversion, may be committed by a neuropathic individual under the influence of an obsession. What is the outlook in obsessions with irresistible impulses? The evolution of these symptoms presents nothing typical. It may be periodical and intermittent. Sometimes it appears for a short period and disappears completely. In other cases it is slow, remains stationary for months and years. In still another series of cases the symptom disappears, but recurs from the least cause. As Magnan has well said, they are episodic symptoms in the life of a degenerate. They are incorporated in the mental state of the individual, and never become separated from him. Appearing now and then during his life, they never undergo modifications; they are always the same.

In making a diagnosis of cases of this order it should always be borne in mind that while morbid impulses for minor offenses are frequent in the neuropathic individuals in general, the irresistible impulses toward acts of graver nature, as homicide and suicide, are not frequent. They are met with often in true insanities in which the individual blows out his own brains or kills, seeks revenge, because he is under the influence of a delusion or is prompted by hallucinations of a terrifying nature. When a patient suffers from melancholia, she is mentally tortured by her delusion of the unpardonable sin, of her physical worthlessness, of deserving punishment for imaginary misdeeds. Voices are constantly reminding her of her wrongdoing. Such an individual will seek relief from continuous torture and finally commit suicide. Sometimes her delusive ideas will run in a somewhat different channel, and she will imagine that through her sins her relatives and neighbors, husband and children will undergo punishment and will suffer; in order to save them from inevitable suffering and torture she prefers killing them herself, and acts accordingly.

In the diseased mind of a paranoiac a grudge develops against certain individuals, who for an apparently logical reason are persecuting him or trying to prevent him from obtaining a certain important position which they themselves are seeking. He hears their voices through the wall at night; sees them masked in his room. Another paranoiac receives a mission from God to preach, to convert sinful men, women, communities, nations. He gets messages from the Almighty through spirits, angels, who order him to accomplish his task and destroy any obstacle on his road. Such individuals will exhibit irresistible impulses commanded by their delusion and hallucinations and commit suicide. In paresis similar delusion may lead to identical consequences. In dementia præcox when the youth commences to show signs of dementia, hallucinations and delusions develop; he commits excesses and assaults of the gravest character, kills, or commits suicide. A senile dement forms delusions of being defrauded and robbed; he believes himself being persecuted. Frequently erotic delusions make him plan ridiculous marriages, and if he is prevented from doing it he assaults and kills. Assaults of senile dement on very young girls or children are not uncommon.

In toxic insanities, especially alcoholic, the delirious and confusional states are frequently ac-

companied by delusions and hallucinations; morbid impulses are then easily formed. In epilepsy, after the motor manifestations are over, the patient remains in a confusional, delirious, or stuporose state, during which irresistible impulses may develop and a crime may be committed. Sometimes the epileptic attack itself may consist of a sudden irresistible impulse for attacking, assaulting, and injuring. In determining the nature of and the motives for morbid impulses only a prolonged and thorough examination will help the medicolegal expert to form an impartial opinion.

Let us emphasize the distinctive diagnostic points, as they are essential for a proper conception of these interesting phenomena. When a lunatic assassinates, he is under the control of a delusional conception and hallucination or illusion, by which he is carried away toward the abnormal impulse. The latter has a special character, viz., unconsciousness of the act; automatism is the essential feature. When a morbid impulse is the result of an obsession in a neuropathic individual, the characteristic features of the act are the lucidity of consciousness, the tormenting mental struggle before the act is accomplished, and the realization of the horror of the act. At the same time the state of anxiety of the patient is accompanied by cardiac palpitation, acceleration of the pulse, headache, tremor, perspiration, etc. All these symptoms occur in an individual whose mentality is abnormal, irregular, asymmetrical, and without equilibrium. In such an individual the soma will frequently be found deviated from normal; there will be present many stigmata of physical degeneration, as disturbed functions of the viscera, of tissues, of organs. A profound study of his own life, his reactions to external and internal stimuli, his adaptability to surroundings, his family history, and the hereditary features are indispensable in making a diagnosis.

MEDICOLEGAL CONSIDERATIONS.

The question of responsibility of individuals presenting morbid impulses is of the greatest moment from a social and medicolegal point of view. It is frequently accompanied by difficulties and has led not infrequently to many judiciary errors. The primitive society of mankind recognized crime as a punishable act, irrespective of any other consideration. The criminal was always punished, no matter what his mental state was. Ancient legislation ignored entirely the question of irresponsibility. The Romans were the first who distinguished between *compos* and *non compos mentis*. The great difficulty was to determine under what condition an individual ceases to be *compos mentis*. Prejudices, errors of all sorts, and religious and political passions interfered with the proper understanding of cerebral functions, genesis of ideas, and their manner of manifestations. Even the humane principles of the French Revolution were unable to eradicate from the minds of the legislators the deep seated ideas of moral responsibility.

With the advent of Pinel and his school, a new era was inaugurated. With him the old ideas suffered a decided blow. He succeeded in convincing human minds that insanity was a disease and that there was no crime if the criminal was insane while

committing it. Gradually the field of responsibility became wider and wider. The criminologists of the new anthropological school, and with them the psychiatrist and all students of normal and abnormal psychology, jurists, and enlightened laymen, all admit now that a neuropath, as defined, presenting episodic paroxysms of pathological impulses, cannot be considered fully responsible for his criminal tendencies and acts, and that instead of being committed to prison, he should be removed from society and placed safely to undergo medical treatment. Medicolegal literature is full of examples of indeterminate conviction of this category of individuals. Notwithstanding the considerable work of the psychiatrist and the incessant labor of the profound students of psychology and of the evident and flagrant injustice to mankind, some jurists are loath to accept the humane and scientific principles laid down by the workers in this field of human knowledge. It is, of course, proper to advise, as they do, to moderate the passions and to learn to control them, but this is possible only for a brain free from any hereditary or acquired taint. It is just as difficult to control and direct the operation of a brain whose anatomical and functional integrity is affected as it is to hold oneself straight with a spinal column which is scoliosed or otherwise deviated.

Degenerates with morbid impulses are, therefore, irresponsible; but what is the degree of their responsibility between the acts, i. e., during the lucid intervals? Here jurists, alienists, and anthropologists are not exactly of the same opinion. The old classical school of criminology believes in so called partial responsibility. They say that because an abnormal brain, although not insane, has an abnormal will, an abnormal conception of right and wrong, the law should impose only partial punishment. Modern psychiatric views, the glory of which belongs mostly to the French school and especially to Magnan and his pupils, are based upon a different conception of degeneracy and criminality. Lombroso, Ferri and Garofalo in Italy, and Broca, Brodier, Manouvrier and Lacassagne in France have laid the foundation for the modern anthropological school. According to the anthropologist the criminal is under two kinds of influences: intrinsic or individual and extrinsic or social. This double responsibility in a neuropathic individual is nil, and his irresponsibility is absolute at all periods of his life; its excuse lies in the heredity and in the morbid impulses which are not present in normal beings.

When an expert is called upon to give his scientific opinion on crime committed under the influence of an irresistible impulse, he has to consider not only the crime, but also and mainly the criminal. As to the criminal, it must be determined whether he is insane or only a neuropathic individual affected with obsessions and morbid impulses. In both cases a thorough and careful examination is absolutely necessary. When the crime is committed without a motive, when it is accompanied by a perfect integrity of conscience, when it is preceded by a mental struggle, there is no doubt that it was the result of a morbid obsession. In insanity the expert will sometimes encounter difficulties. In the first stages of a mental affection, in which a perverted mode of

thinking, feeling, and acting is not easily recognizable; in epilepsy, when between the attacks the individual is comparatively lucid; in some cases of paranoia, when the patient will skillfully conceal the subject of his delusion, in such cases the expert will have to surround himself with all possible precautions, obtain detailed personal and family histories, interrogate the criminal at various times before he decides the question of insanity, or responsibility. The expert under these conditions must give not only a personal impression more or less justified by his own experience, but also present evidence which will be understood by laymen. The determination of the degree of responsibility of a criminal should therefore be placed in the hands of an alienist. Only he is capable of determining early stages of insanity, only he is able to determine apart from insanity the degree of mental control, of inhibitory power of a delinquent who presents mental stigmata of degeneracy.

There is a frequent conflict between medical and legal conceptions of insanity. The law admits that a man with one fixed delusion may be sane on every subject except when he touches upon the delusive thought, and some consequently argue that he can be considered sane before or after a crime is committed, but insane during the act. From a medical standpoint such an argument is unscientific, for if delusive ideas are apt to originate in a brain, the function of its constituent elements is certainly disturbed. In such a brain one certain delusion may be formed and remain fixed, but by the very reason of this fact, this brain must be considered diseased and misconceptions with misinterpretations may become manifested at any moment. An individual thus affected should by no means be considered "responsible before the law" before or after the crime.

I will conclude with the following propositions:

The legal conception of responsibility is not in accordance with the principles of science and does not satisfy the practical exigencies of life. An alienist should be called upon to examine such a criminal. Administration of justice in such cases should be confided to a jurist and to an alienist.

Administration of houses of correction should be placed in the hands of alienists and pedagogues.

Youthful criminals should be placed, not in prisons, but in special institutions where they shall receive medical attention.

Conviction of criminals intellectually and morally defective is unjust and should be replaced by prophylactic measures which form a part of social hygiene.

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Blood Cholesterol in Pernicious Anemia.—Au-

gust J. P. Howe (*British Medical Journal*, 1918) concludes that in pernicious anemia the relation of the cholesterol in the serum and in the cells is altered in that the serum content is diminished; the cell content is increased, and the whole blood content is decreased. Such marked alteration is not evidenced in cases of secondary anemia.

THE GENITOURINARY CLINIC.*

BY NATHANIEL P. RATHBUN, M. D.,
Brooklyn, N. Y.

The younger men going into a genitourinary clinic are readily divided into three groups:

1.—Men who, just starting in practice, have nothing to do and want something to fill in time. It occasionally happens that some of these unpromising prospects develop an interest in the work and become an asset to the clinic. More often, however, they flounder around for a while and then drift along into some apparently more entertaining pastime.

2.—Men who, while they have no intention of ever confining their work to urology are sincere in their efforts to broaden the scope of their knowledge, and among other things wish to get on speaking terms with the fundamental principles involved in the diagnosis and treatment of genitourinary diseases. Men of this type are an asset to any clinic.

3.—Men, relatively few in number, who start out with the deliberate purpose of becoming urologists, and who are willing to massage prostates, pass sounds, examine smears, and do other routine duties over a long period of time, meanwhile familiarizing themselves with the cystoscope as an instrument of diagnosis and treatment, feeling that in time they will become qualified and be given the opportunity to diagnose and treat a prostatic adenoma, or a tuberculous kidney.

In any event, all men going into clinics do so primarily for the purpose of furthering their own personal interests, and this factor continues permanently throughout their work. This is altogether fitting and proper so long as other relations are not entirely neglected. After all, we are students, every one of us, and all striving to broaden our knowledge and perfect ourselves in our chosen field of endeavor. The young man soon comes to realize that his own interests go more or less hand in hand with the interests of his clinical patients. In other words, if he continually gives the patient the best he has, and treats him as a real human being, just so far is he advancing his own interest and becoming a better urologist. It takes a little longer for the average man to become duly impressed with the important relation which the clinic, and he personally as a member of it, bear to the community. That a venereal clinic has such an important relation is self-evident. It is only comparatively recently, however, that this fact has been brought home to the profession, to the public, and to the public officials. May I be pardoned for affirming that not a little of the credit for placing this matter prominently before the public is due to my associate, Doctor Thomson, and to the work which is being done in our clinic?

Broadly speaking, in times like these, with our country at war, and venereal diseases so prevalent among our recruits, the relation of the urologist to the community is of paramount importance, and, briefly stated, is along three lines: first, the treatment and cure of venereal diseases; second, education of the patient and, through him, the public; third, the training of young men so that they may

go on and do their bit either in civil or military life toward controlling this greatest of all menaces to health and happiness.

Under the first, I must frankly admit that the number of our cures in venereal cases is discouragingly small, partly because of the nature of the diseases, and partly because of the well known difficulty of keeping the patient under observation until he has complied with all the tests of a complete cure. However, we do cure some of them, and our follow-up system has materially aided us to increase that number. Much, too, is accomplished for those patients who are not cured, many of them being carried beyond the flagrantly contagious period of their disease. While all of us, no doubt, agree with Ricord's remark made many years ago, that God alone knows when clap is cured, nevertheless I am confident that many of our cases of chronic gonorrhoea who discontinue treatment before they have been checked up on all the tests for cure are really non-infectious, and clinically, at least, are well.

These remarks apply more particularly to our syphilitics (and I refer here to carrying patients beyond the contagious period of their disease). I believe that all our patients are brought beyond the period when they would be likely to convey their disease directly by sex contact. That alone I consider a great accomplishment. While of course we aim in every case at a permanently negative Wassermann (and we get it occasionally), I am rather pessimistic, personally, about a lasting serological cure in late neglected cases. We feel that we have performed an important function if our patient leaves us with an entire absence of manifest infectious lesions. Of course we know that these cases are not cured, but we believe that many of them remain permanently free from grossly infectious lesions.

The second item, under the caption, Our Relation to the Community, is the education of the patient, and through him his friends and the general public. This, I feel, is an important function of any genitourinary clinic, and occupies a prominent position in ours. By means of signs, literature, and personal talks we endeavor to impress upon the patient the real seriousness of his condition, the difficulties attendant upon effecting a cure, and the difference between thorough scientific treatment, and the quick treatment which so often tempts him with its promise of a speedy cure. While I am free to confess that the results obtained from our efforts are not all that could be desired, and I have no doubt that there are men who leave our clinic with our literature in their pockets and go direct to the nearest house of prostitution, to plow again the seeded pastures, yet I am sure that we are doing some good. I believe that in education we have the most powerful weapon at our command for combating the social evil—much more valuable, it seems to me, than legislation. It is no easy matter to enact legislation which will protect a man against himself. I am firmly of the conviction that many of our patients are impressed with our efforts to help them, and leave the clinic with a determination to get well and to stay well, and that they pass the word along to their friends.

Thirdly:—the training of younger men in this

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line of work. Of course we are all doing this to a certain extent. Much more might be done. Hospitals connected with medical schools and post graduate colleges have a decided advantage in this respect. Why should not all genitourinary clinics be in a sense post graduate schools? It would be an asset to any medical man to spend from three to twelve months in such a clinic and would materially increase his efficiency in his general work. The question arises Where shall we get our students? This is perhaps too large a matter to be discussed within the time allotted to this paper. Many of you are familiar with the efforts of some of our members to establish a series of model clinics in connection with the Medical Reserve Corps of the Federal Government. It is unfortunate, I think, that this fell through.

The relation of the clinic to the patient: Any success which our clinic may have had is due in no small measure to the very definite personal relation existing between the doctor and the patient. I personally have made an effort to treat every patient courteously and kindly, and this attitude has been carefully passed along the line. On the occasion of the patient's first visit it is the function of some member of the staff to discuss the whole matter carefully with him, and as his case advances to explain the reason for the things that are done. In this way we secure a cooperation on the part of the patient that could not be had in any other way; moreover as noted at the beginning of this paper, this attitude is a part of the training of the doctor himself. No doubt many other clinics take this aspect of the situation into consideration—just as thoroughly or more so than we do here. On the other hand there are some clinics where the maintenance of this human relation is very sadly neglected.

Relation of the clinic to the staff: Men who are giving up a goodly portion of their time to clinic work, definitely expect some personal return for their labor, and they are entitled to it. I am sure that the spirit of altruism enters as largely into our work as it does into the work of men of any other calling. Nevertheless men are in a clinic primarily to advance their own personal interests. They come there to learn. This factor, too, we have tried to make prominent. I believe that one of the most important functions of a clinic chief is to encourage, train, criticize, and teach his men. It is not entertaining to point out the landmarks of a normal bladder to a new recruit, at the expenditure of much time, but that man wants to learn how to use a cystoscope, and he is entitled to have some one teach him. It is a very necessary part of our work. The rotation of stations in our clinic materially helps in this phase of the work, for the chief of clinic and some of the senior assistants go about the different stations from time to time and make criticisms and suggestions, advise medications, and talk over some of the more interesting cases. All the men look forward to the month in the cystoscopy room, and we try not to let them be disappointed in the work they do there. They become familiar with the use of a cystoscope and its various accessories; they are shown the appearance of a normal bladder, and the various pathological lesions that come under our

care. Like most other clinics we have a number of what we call "dummies"—men who have normal bladders, and who seem to enjoy, or at least do not object to repeated cystoscopies. They make excellent material for the beginner. Unusual cases, and cases that are peculiarly resistant to treatment are asked to return at an hour when we are least busy and we hold consultation upon them. Suggestions are made by various members of the staff, and, not infrequently, the chief of clinic has his efforts rewarded by learning something himself, all of this tending to stimulate greater enthusiasm, which of course means far better care for the patient.

There is one weak link in our chain, and this I have no doubt applies to many excellent genitourinary clinics. Our relation to the hospital is not as close as could be desired. The Brooklyn Hospital has no definite organized and designated urological department. The chief of clinic is attached to one of the general surgical services with the title of associate surgeon, and has assigned to him by the surgeon in charge two thirds of all the urological work coming into the hospital wards. This practically consists of those cases coming in from the clinic. This arrangement is in a measure fairly satisfactory to the clinic chief although it has obvious disadvantages. However, it is manifestly unfair to the other men in the clinic who are entirely out of touch with the hospital end of the work, and are thus deprived of an important part of their training to which, in my opinion, they are justly entitled. We have reason to hope that this error, and I think it is one, will be corrected in the reasonably near future.

G. HANSON, PLACER, BROOKLYN.

THE TREND OF MODERN DERMATOLOGICAL RESEARCH AND ITS BEARING ON GENERAL MEDICINE.*

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Medical science proceeds along two distinctly differentiated methods of investigation, induction and deduction. In routine medical research the inductive method is the one commonly employed. Of all the branches of clinical medicine dermatology has been most persistently subjected to the inductive method and until lately deduction has been almost completely ignored in this branch. The history of modern dermatology presents remarkable evidence that no branch of science can be fully developed without a combination of these two methods. Scientific dermatology, founded by the great Hebra and his associate in pathology, Rokitsansky, has developed along the lines of descriptive study of clinical, morphological, and pathological details of cutaneous lesions. This has led to an enormous accumulation of casuistical material without a commensurate gain in the knowledge of etiology and pathogenesis of systemic dermatoses. As a nat-

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ural consequence, dermatological nomenclature became so intricate and redundant and the classification of skin diseases so uncertain and overlapping that dermatology came to be regarded by the general profession as a branch peculiar and distinct from the rest of clinical medicine. In a word, the exclusive use and reliance on the method of induction and complete neglect of deduction has led to the ingrowth and isolation of dermatology, has deprived dermatological research for a long period of time of the healthy growth necessary of collaboration, and interdependence with the other branches of clinical medicine.

A healthy reaction was ushered in by a French dermatologist, Brock (1), who advanced a new conception of skin diseases as a "cutaneous reaction to a local or constitutional irritant." This deductive idea born from the intuitive genius of a French mind, has acted as leaven in the product prepared by the systematic inductive German research. The impetus given by this idea has proved to be a turning point in the development of scientific dermatology. The old method of descriptive study of minutest clinical and morphological details and hair splitting pathological changes has reached the limit of its usefulness in the process of identification and classification of cutaneous lesions. The etiology and rational treatment called for new, deeper, and broader viewpoints, and these have been abundantly supplied by the new conception of Brock's "cutaneous reaction." The first and the most marked effect of the new spirit in dermatological research was a sudden influx of contributions and suggestions from the associated fields of medical research. Physiological chemistry, bacteriology, serology, and various clinical branches have virtually flooded the field of dermatology with new ideas and observations. New viewpoints of correlation and new vistas of pathogenic phenomena have been revealed and new interpretations have been given to many obscure dermatoses. This new period of scientific dermatology can be rightly called the biological period in contradistinction to the preceding descriptive and pathological periods.

The results already accomplished both in theoretical research and in practical therapeutics are vast and tangible. Our knowledge and understanding of the pathogenesis of many dermatoses have been written anew or radically revised, and for many hitherto intractable skin diseases we have acquired means of perfect cure or at least of clinical control. It is of greatest importance for common interests both of general medicine and dermatology to have a clear idea what contributions dermatological research has received from the general medicine and what in return clinical dermatology has contributed to the general medicine.

Anaphylaxis in dermatology.—Possibly no other contribution to dermatology had a greater influence on its development than the idea of anaphylaxis. Anaphylaxis was for the first time experimentally reproduced and theoretically explained by Richet. Later it was put on the solid bases of experimentation by von Pirquet, who has termed it "allergy." Still later Rosenau and Anderson established the specificity of anaphylactic reaction, i. e., guineapigs

sensitized with horse serum do not react against other albuminoids such as egg or albumin. The phenomenon of anaphylaxis has provided a solution of etiology of many a case of urticaria, chronic eczema, and other dermatoses produced by the ingestion of food. If albumin of ingested food is not sufficiently split and disintegrated by the intestinal secretions, an albuminoid foreign to the body results; its absorption into the circulation produces specific antibodies which disintegrate this foreign albuminoid and set free toxic products. Thus skin sensitization to this particular substance develops, which precipitates a cutaneous outbreak. The intensity of the reaction is independent of the quantity of noxious substance, as infinitesimal amounts in some individuals may provoke an attack. This accounts for the difficulty of determining empirically the offending substance in urticarias and eczemas induced by foods. The clinical anaphylaxis extends not only to exogenous proteins of food, but also to endogenous proteins set free by chemical poisons as drugs, by proteins of bacteria and their toxins, or by the proteins of metabolism as in toxic dermatoses. In drugs and serum eruptions it is assumed that the native albumin is transformed into foreign protein by the fixation of the drug to the albumin molecule.

Toxic dermatoses.—No group of dermatoses has been more affected by the idea of anaphylaxis than have toxic eruptions. A new clinical grouping of these forms has resulted from a new conception of the formation of toxins. Dermatoses that under the old descriptive principle of classification were quite distinct, such as urticaria, erythema multiforme, dermatitis herpetiformis, and pemphigus, now were brought together into clinical relationship on the basis of common etiology and similar pathogenesis. On the other hand, dermatoses that clinically present identical or similar forms, such as many eczemas, urticarias, and various forms of dermatitis venenata, were shown to be produced by different etiological factors and were separated into different groups. There is no question that the brilliant generalization of Dühring, who united, apparently, so different clinical forms under a common generic name or dermatitis herpetiformis, was inspired by an intuitive vision of common pathogenesis of systemic toxemia. The first attempt to apply practically the theoretical postulates of anaphylaxis was clinical experiments by Strickler, of Philadelphia, who undertook diagnostic subcutaneous and intracutaneous tests of various proteins in solutions to determine the specific alimentary irritant in various food eruptions.

Internal secretions in skin diseases.—Another deductive principle recently introduced in dermatology which has already proved of far reaching importance is the action of ductless glands. Highly mysterious and complex workings of these organs, the effects of correlative and antagonistic action of their hormones, are just in the beginning of their solution and interpretation by clinicians and pathologists. Yet the hypothesis of internal secretions has already cleared up many hitherto insoluble problems and has opened a new fascinating vista of therapeutic possibilities. It has been found that many cutaneous disorders are produced or at least influenced by the internal secre-

tions of ductless glands. The most important of these glands is thyroid, which can be truly considered the keystone of the whole system of endocrine glands. Several cutaneous symptom complexes or syndromes have been established corresponding to an excessive or deficient secretion.

Hyperthyroidism, the extreme type of which is represented by Graves's disease, renders the skin thin and tends to excessive perspiration, and easy flushing. It leads to urticarial attacks, pigmentations, dystrophies of the nails, keratinization, and pruritus. On the other hand hypothyroidism, represented in its extreme development by myxedema, produces a thick dry pasty skin, suppression of perspiration, lustreless, brittle hair, and alopecia. It is a well established clinical observation that many cases of scleroderma, dry eczema, psoriasis, and ichthyosis improve under the administration of thyroid tablets, thus suggesting hypothyroidism as the underlying etiological factor of these dermatoses. The relationship of other ductless glands and their internal secretions to skin disorders is not as definitely established, yet a number of clinical observations is recorded to substantiate such a relationship.

The association of pathological changes in the adrenal glands with Addison's bronze skin discoloration and purpuric rashes, as well as a successful treatment of many cases of vitiligo with an extract of suprarenal glands, is well known. The disorders of the hypophysis are manifested by a symptom complex of acromegaly, fibromatous growths, warts, alopecia in men, and hypertrichosis in women. To the internal secretions of sex glands are attributed many cutaneous disorders, such as skin changes after castration, herpes progenitalis, erythema multiform, urticaria, vicarious hemorrhages under the skin and nails associated with menstruation, types of eruption described under the name of dermatitis dysmenorrhoea, pigmentation of linea alba and nipples, chloasma uterinum and impetigo herpetiformis associated with pregnancy, and the tendency to hypertrichosis and acne rosacea at the climacteric. The frequent observance of disorders of internal secretions in a very large clinical group of angioneurotic dermatoses, such as Raynaud's local asphyxia, symmetrical gangrene, scleroderma, angioneurotic edema, menstrual urticaria, herpes, and dermatographia, is highly suggestive of the close association and correlation of the sympathetic vasomotor nervous apparatus and ductless glands. All these clinical observations inspired by a new conception of internal secretions have not only thrown light on a hitherto obscure etiology of many dermatoses but also have provided us with a new therapeutic resource of great promise.

Focal infection in skin diseases.—Another idea of great clinical importance in dermatology was a theory of focal infection. This theory was extremely fruitful; it cleared up the etiology of many heretofore obscure conditions and influenced greatly the therapeutics of these cases. The identification of pathogenic foci of infection was based either directly on proving the bacteriological identity of the microorganisms found in the skin lesions and the suspected foci of infection, or on the clinical cure or improvement of the skin lesions after the

elimination of these foci. It is assumed that skin lesions may be produced either by the microbes themselves or by their toxins. Numerous cases have been already reported where focal infection proved to be an etiological basis of cutaneous lesions, and every day brings instances where skin lesions have cleared up after a certain focus of infection has been eliminated. Of various parts of the body that have been found harboring such foci the most frequent offenders are the tonsils, teeth, nose, prostate and seminal vesicles, urethra, kidney, bladder, appendix, and middle ear. A most brilliant and conclusive demonstration of the dependence of skin lesions on focal infection has been made by Rosenow who reproduced experimentally herpes zoster and proved that certain strains of streptococci had a selective affinity for the skin. Among rashes produced by focal infection the most frequent are those resembling psoriasis, eczematous, bullous and erythematous rashes, herpetic forms, and types of erythema multiforme and nodulare.

Hematological changes in skin diseases.—The new spirit of dermatological research has manifested itself not only in the introduction of new ideas and hypotheses as working basis for clinical observations, but also by many new approaches and new methods of attacking dermatological problems. One of these methods is analysis of the blood in skin disorders. A systematic examination of the blood in a great number of skin diseases has been made by Leredde, McLeod, Crocker, Ravitch (2), etc., with the object of possibility of noting some constant and characteristic hematological changes incident to certain dermatoses. The method is so young and complex that no definite clinical results could be expected at present. Yet some important clinical conclusions and side lights have been obtained. Thus eosinophilia has been found in a large number of dermatoses such as exudative eczema, scabies, pemphigus, psoriasis, pellagra, and lichen planus. While the expectation that eosinophilia might be attached to certain types of dermatoses has not been materialized, yet the impression seems to be warranted that it is associated with and points to phenomena of skin anaphylaxis.

Another important and far reaching conclusion has been reached through a simultaneous study of blood changes and coexistent skin lesions in leucemia. This study has brought out a more or less definite cutaneous syndrome which may render a diagnosis of leucemia possible independent of the blood study and occasionally before the development of any other clinical symptoms. It has opened also a new vista in pathogenic relationship between Hodgkin's disease, mycosis fungoides, and lymphosarcomatous diseases which on the bases of the old descriptive method of classification have been always considered entirely distinct, separate, and independent clinical forms. The study of blood coagulation time in various dermatoses has been also undertaken by various investigators. Weiss found the coagulation time in eczema, acne, and furunculosis lengthened, while in urticarias, erythemata, and purpura it was found shortened.

Metabolism in skin diseases.—Factly metabolism taken in a strict sense of biochemical process, as an

etiological factor in skin diseases occupied the attention of clinicians earlier and to a greater extent than any other factor. In fact, the time honored theory of elimination of body impurities by the diseased skin, a theory which was eagerly and implicitly taken up by the layman as the universal cause of skin diseases, was founded on this assumption. It is rather surprising and disappointing, therefore, that research along these lines has given less definite and less conclusive results in regard to pathogenesis and therapeutics than many of the newer and more recently acquired ideas, such as anaphylaxis, internal secretions, etc. In spite of the well known empirical association of skin diseases and digestive disturbances, no specific relationship could be established between certain metabolic and cutaneous disorders. Johnston considers hyperacidity the most frequent etiological factor in producing eczema. Numerous studies of metabolism in skin disorders were undertaken with a view of solution of special metabolic problems, such as retention of nitrogen and elimination of chlorides and of uric acid, etc. One of the most exhaustive and thorough going metabolic studies was made by J. Shamberg, (3) of Philadelphia, and his associates in psoriasis and eczema. The conclusions reached were that cases of psoriasis and systemic eczema exhibited a nitrogen retention and improved on low protein diet, that the elimination of creatinin was normal and that the increase of the output of uric acid should not be interpreted as indication of the gout. The retention of chlorides was not found in eczemas, according to Ravitch, and the administration of salts was found by Bruck and Galewsky to improve eczema.

An idea generally accepted by the profession that many skin diseases are produced by toxemia induced by intestinal bacteria, was tested bacteriologically by J. Willock, (4) of Baltimore, in a series of dermatoses. The results were of negative character as no definite casual relationship could be established between intestinal flora and skin diseases.

Diatheses in skin diseases.—Another hypothesis of the influence of systemic metabolism on skin disorders, a hypothesis which has not been sustained in the light of modern research, is that of diathesis. The doctrine of diathesis or constitutional dyscrasias takes its origin from the times of humoral pathology. It was particularly fancied by the French dermatological school which accepted a number of them, such as arthritic, rachitic, scorbutic and herpetic diatheses. All these constitutional tendencies to cutaneous outbreaks are largely substituted and explained at present in an easier, more rational and more definite manner through the modern concepts of internal secretions, anaphylaxis, focal infection, etc. No specific relationship between these diatheses and certain dermatoses can be established. At present, the term diatheses is used to denote a certain general weakness of the skin and conveys a clinical descriptive rather than a definite pathogenetic significance.

Nervous reflex theory of dermatoses.—A theory that was largely discredited and interpreted in a more modern manner was the neurogenic or nervous reflex theory of skin diseases. Formerly any skin

disorder without an apparent etiology was classed as being of nervous origin. As our knowledge grew and became more precise, one after another of these clinical forms was identified more definitely, dropping out of the group of nervous dermatoses. While the participation of the nervous system in these cases is to be admitted, the mechanism of the production of cutaneous lesions is to be interpreted differently from the old time conceptions. The nervous system is not a primary and original pathogenic factor in these cases but is either a secondary carrier of the pathological factor or it is affected simultaneously with the skin by some common undiscovered agent. Thus herpes zoster has been proved to be due to streptococci infection of the nervous ganglia, many cases of alopecia areata are due to focal infection of teeth and nasal sinuses, cases of "nervous" urticaria have been traced to food anaphylaxis, and many vasomotor dermatoses were traced to toxemias or disturbances of glandular secretions. At present, we can admit a functional neurogenic origin only in a comparatively small number of dermatoses such as many cases of local and generalized pruritus, hyperhidrosis and so called trophoneurotic disturbances, as atrophias and disorders of skin pigmentation. There is no question, however, that this number will be gradually reduced still more with the extension of our knowledge.

Service of dermatology to general medicine.—The relationship of dermatology to general medicine, as of any other special branch, is twofold. First, dermatology has a specific field of its own which comprises all dermatoses originated by external etiological factors, having no pathogenetic connection with any internal organ or any systemic condition, and limited in the clinical course to the skin only. The second class of skin diseases is symptomatic in character in so far as skin lesions are produced or influenced by some internal systemic condition. This group of symptomatic dermatoses, unquestionably, is much the greater of the two, which fact is by itself an ample justification for an internist to be interested in skin disorders. The skin lesions may be coexistent with visceral disorders, they may precede their development, or they may be the only manifestation of underlying internal condition. In this group of cases the symptomatic significance of skin diseases as the surface indicator of the internal disorders renders the greatest clinical service. How far dermatology will be able to develop this service of detecting or at least suggesting visceral disorders obviously remains for the future to reveal. This service is already now considerable and it grows larger as our knowledge of correlation of cutaneous and visceral lesions expands. The whole group of infectious exanthemata depends essentially on dermatological diagnosis. The enormous domain of syphilis from the primary lesion, through the entire secondary stage, and far in the tertiary period belongs diagnostically to dermatology. Even now in spite of the invaluable diagnostic service of the Wassermann test and its modifications in visceral syphilis without cutaneous lesions, it is admitted that serological examination is inferior in definiteness of conclusions to the positive clinical evidence

of dermatological diagnosis. The cutaneous symptom complex of syphilis in its most common types and manifestations should be firmly and permanently imprinted in the mind of every practitioner.

The intelligent dermatological diagnosis of syphilis in daily practice would go far toward redeeming many thousands of syphilitic cases, now overlooked or unrecognized until they pass beyond the stage of therapeutic control and develop deep organic lesions of nervous and cardiovascular systems.

Another valuable cutaneous syndrome offered to the internist by a dermatologist is diabetic. Dry, lustreless skin, local or generalized pruritus, eczema of the genitals, attacks of furunculosis or carbuncles, dry gangrenous ulcers and xanthomatous formations, all these symptoms, singly or combined, suggest to a trained eye a possibility of underlying glycosuria. It is not rare for the dermatologist to be the first to detect a latent diabetes on the strength of some of these symptoms. One of the best established cutaneous syndromes, that of tuberculosis, is not sufficiently appreciated and utilized for the purposes of diagnosis. So called tuberculides are assumed to be due not to Koch's bacillus directly, but to its toxins. Pathologically they are specific granulomata with a tendency of central softening, necrotization, and scarring. The best defined and the most common are lichen scrofulosorum, folliculitis, acne varioliformis, and erythema induratum of Bazin. These lesions are often associated with active or latent tuberculosis of visceral organs or lymphatic glands and should be more often utilized as a surface indication of deep focal tuberculosis.

A cutaneous syndrome which should be of intense interest to the internist and still more to a pediatricist is the group of erythema multiforme, because of its clinical relationship to the so called rheumatic infection. Three types of the erythema multiforme group are often associated with constitutional symptoms of malaise, fever, and involvement of the joints: erythema of large papular type, erythema nodosum, and the purpuric type which, according to the intensity of constitutional symptoms, is termed purpura rheumatica, purpura hemorrhagica, Werlhof's purpura, and Henoch's purpura. Timely recognition and correct interpretation of these cutaneous lesions in cases where they precede visceral symptoms can be of greatest service in the prevention of further development of rheumatic infection and its cardiac complications. This symptom complex should be gravely regarded as a surface indication of deep streptococci infection somewhere in the system calling for a thorough search of it and not to be lightly dismissed as a common food rash, as often happens.

The modern dermatological research has already contributed some very important cutaneous syndromes, such, for instance, as syndromes of hyperthyroidism and hypothyroidism. The first, produced by a surplus of thyroid secretion, the extreme type of which is Graves's disease, is manifested by thin, readily perspiring, easily flushed skin, dystrophism of the nails, tendency to urticarial attacks, pigmentations, and pruritus. The second, due to insufficient or abnormal thyroid secretion, has for its extreme type myxedema and is manifested by thick, dry, pasty skin, suppression of perspiration, dry,

lustreless, brittle hair, and alopecia. It is to be remembered that disturbances of thyroid secretion as an etiological factor of skin diseases do not always figure as the sole causative factor or appear in the extreme types. They are often manifested as a mild or partial deficiency, vary greatly in individual cases and often play a secondary or contributing part. For this reason thyroid administration should be always supplemented by other local or general measures. Thyroid as a therapeutic agent in chronic dry dermatoses is sure to have in the future a much more extensive field than it does at present. Cutaneous syndromes of other ductless glands, such as suprarenal, hypophysis, and ovary, are still in a formative stage and do not allow as yet any definite clinical conclusions. Another recently introduced cutaneous syndrome which has been well emphasized by Cole (5), of Cleveland, is leucemia, or Hodgkin's disease. The leucemic syndrome, besides bluish tumors which are true lymphogranulomata, comprises also a number of pseudoleucemides, such as persistent pruritus, urticarias, prurigo-like exanthemata, bronze pigmentations, and purpuric lesions. The appearance and persistent development of these lesions without other definite etiological factor should suggest a possibility of latent Hodgkin's disease and call for a blood examination.

To illustrate the many possibilities of dermatological service to general medicine two instances of recent date may be quoted. The first is a clinical observation of the association of systemic gonorrhea with keratotic formations preferentially on the palms and soles. A series of over twenty cases has been reported by Simpson (6) and others, where such keratoses developed in gonorrhea complicated with involvement of the joints. In some of these cases skin lesions cleared up with the improvement of gonorrhea and of joint symptoms. These ceratoses were assumed to be caused by gonorrheal toxins, but in one case, reported by Campbell, gonococci were demonstrated in skin lesions. Another observation of great practical interest has been reported by Netter, of England, recently. Using as an analogy the finding of typhoid bacilli in typhoid roseola, he demonstrated meningococci in purpuric and petechial spots in cases of meningitis, in some of the cases before any meningeal symptoms had developed. Netter (7) considers this test of great diagnostic value in meningitis and urges its trial in all cases of obscure fever with a skin eruption.

This completes a brief presentation of the tendencies in modern dermatological research and of the service modern dermatology offers to the internist. The writer has deliberately omitted all reference to the clinical field of local dermatoses which specifically belongs to dermatology. The progress in this specific field consists in establishing new clinical forms and the development of therapeutic resources. This is accomplished by independent efforts specific for dermatology and is only of indirect interest to the internist. It is in this field that the older descriptive and pathological methods of dermatological research are still supreme in establishing morphological and pathological identity of clinical forms. Yet it is possible that the whole system of modern dermatological classification is

only a temporary vehicle of dermatological thought, a mere working hypothesis at the present state of knowledge. It is possible that under some new illuminating and deductive concept of biological character similar to Brock's idea of "cutaneous reaction," entirely new bases will be furnished for dermatological classification.

SUMMARY.

1. Dermatology after having gone through descriptive and pathological periods of development is now going through the final stage of its growth which can be rightly termed a biological period.

2. A complete recording of coexistent visceral disorders in skin cases and of coexistent skin lesions in medical cases is necessary for a better knowledge of their possible interdependence and a better understanding of systemic dermatoses.

3. The modern dermatological research has not sustained and has largely discarded old conceptions of diatheses and of nervous reflex in dermatoses and has introduced a new concept of cutaneous syndromes for various underlying pathological systemic conditions, such as hyperthyroid or hypothyroid, diabetic, rheumatic, and leucemic syndromes.

4. The service of dermatology to general medicine is rendered largely through a symptomatic significance of skin disorders as a surface indicator of internal conditions. This service can be measured best by the number of cutaneous syndromes which dermatology may develop and establish for clinical use, and will depend entirely on the extent of a mutual cooperation between internist and dermatologist.

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GROTON BUILDING.

FACTORS IN THE CAUSATION OF TINNITUS AURIUM.

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Probably no symptom in otology occurs with greater frequency and presents more trying and perplexing problems to the aurist than subjective ear noises, or tinnitus aurium. It is a symptom which occurs in a large proportion of cases of ear diseases, estimated by Politzer at two thirds of all cases, and occasionally when there is no obvious auditory lesion. Tinnitus never fails to be a matter of complaint, causing as it does a considerable degree of discomfort to the patient, in some cases of serious danger to the patient's bodily and mental health. On the other hand, a slight impairment of hearing may receive little or no notice for years, and finally be discovered by the patient's friends. For the prognosis and the proper treatment of a condition at times as well nigh unbearable as this is, it is necessary to consider carefully every possible factor which may be involved in its causation. It may be due to a condition easily and quickly remedied or only after prolonged and persistent treatment, or it may from the start defy every known therapeutic measure.

The noises are variously described as singing, ringing, blowing off of steam, hissing, rushing, roaring like the waves on the seashore, and certain musical notes. At times the character of the sound may give some clue to the cause. For example, when the character of the sound is as above described it is practically always due to some irritation of the auditory nerve at its termination in the labyrinth. A bubbling sound may be due to presence of exudate in the middle ear. A crackling or clicking sound may be caused by spasmodic contraction of the salpingopharyngeus which is attached to the Eustachian tube. A pulsating or rhythmic sound synchronous with the pulse may be produced by the flow of blood through the internal carotid, which in its course through the carotid canal is separated from the middle ear only by a thin plate of bone in which there may be dehiscences. Clonic contractions of the intrinsic muscles of the ear, tensor tympani and stapedius, give rise to a tickling or humming sound.

Tinnitus presents itself under various forms both as to quantity and quality of the noise; furthermore, the noise may be intermittent or constant. The noise may vary from a soft barely noticeable rustle, heard only in quiet surroundings, or it may be an excessively loud screaming sound like a steam whistle. Every possible degree is seen. More serious are obscure cases in which the noise takes the form of the human voice, or is of a musical character. It is necessary to distinguish between ordinary tinnitus and hallucinations of hearing; the latter frequently indicates a mental derangement of a serious nature. Such noises point to some irritation of the auditory nerve centre in the temporo-sphenoidal lobe, or in the nerve along its course to the centre. Usually tinnitus becomes less intense and more bearable when the health of the patient is good and increases with decline in health or overwork, either mental or physical. Living in close, stuffy rooms or in the proximity to noisy machinery, overindulgence in alcohol, and excessive smoking have a detrimental effect. In women the trouble may be increased during pregnancy, menstruation, or the menopause. The noise may be heard only when lying down and especially at night, these being the milder cases, or in severe forms of tinnitus may actually interfere with sleep.

In investigating the cause of tinnitus aurium, attention should be given to the factors confined in the ear, and those arising from some general disturbance. Among the general causes worthy of mention are: arteriosclerosis; anemia; epilepsy, in which subjective noises in the ear may precede a seizure; migraine; toxemias from overindulgence in alcohol, tobacco, drugs, especially quinine and salicylates. Neurasthenia as a factor will be considered later. Two classes may thus be considered: 1, tinnitus without defective hearing due to functional disturbance of the auditory nerve centre, functional disturbance of the labyrinth, or abnormal condition of the circulatory system; 2, tinnitus with deafness due to a pathological condition in the external, middle, or inner ear.

When the external or middle ear is responsible for ear noises there is an occlusion of the external auditory canal or impairment of mobility of some

portion of the sound conducting apparatus. Impacted cerumen, furunculosis, or a foreign body in the external auditory canal frequently cause tinnitus, the removal of the cause in these cases leading to complete cessation of the noise, provided, however, more permanent factors in the middle or inner ear are not present. A small epithelial scale attached to the drum membrane has at times been the sole cause of distressing subjective noises. It is a common symptom in cases of tubal catarrh, stricture of the Eustachian tube, acute otitis media, catarrhal or purulent, and all forms of chronic otitis media. Tinnitus commonly occurs in otosclerosis, often being the first symptom even before any impairment of hearing is present. It is mild at first, occurring at night only and deep in tone; later it becomes extremely annoying, often rendering the patient desperate. According to Boeninghaus the tinnitus in otosclerosis is frequently in inverse ratio to the degree of deafness, that is, the more deaf the patient becomes the less is the noise appreciated. In general the noise in chronic middle ear catarrh and in chronic purulent otitis media is not as intense and therefore not as prominent a symptom as in cases of otosclerosis. In middle ear affection, besides the low quality of the tone, the following diagnostic signs are present: Tuning fork examination of the ear is characteristic, that is, the sound is referred to the diseased ear when the fork is placed over the forehead; the bone conduction is decidedly longer than the air conduction; lower tone limits are raised. In absolutely quiet surroundings, a high pitched singing sound is readily perceived by the normal ear; this is especially so in those of a neurotic disposition. Kerrison suggests, in explanation of the reason for tinnitus, that the conducting apparatus of the ear has as its function not only the transmission of sound waves to the ear, but the reflection of some of these sounds outward, sounds which otherwise would act with too great intensity upon the auditory perceptive apparatus. He contends that because of some disturbance in the conducting apparatus, those sounds which are normally conducted outward, are permitted to give a stronger stimulation of the cochlear branch of auditory nerve, thus resulting in tinnitus. Disease of the internal ear is especially prone to cause intense and intractable tinnitus. Many cases of chronic middle ear catarrh with persistent tinnitus not amenable to local treatment are in all probability due to an accompanying congestion or anemia of the labyrinth. They result in an increase or decrease of intralabyrinthine pressure. Congestion of the middle and internal ear from an overdose of quinine may be similarly explained. Attention directed to the general health together with appropriate ear treatment will frequently be of greater benefit to cases of chronic middle ear catarrh than the administration of purely local treatment. Exention or suppuration of the labyrinth from the middle ear is accompanied by severe tinnitus. Luetic involvement of the inner ear or auditory nerve very commonly gives rise to tinnitus. It may be present, usually associated with deafness, after fracture of the base of the skull.

The following cases, illustrating the latter two causes for tinnitus, were seen in the service of Dr.

J. P. Berens in the Manhattan Eye, Ear and Throat Hospital.

CASE I.—D. S., male, twenty-eight years, came to the hospital complaining of intense tinnitus in the left ear, described by him as a constant high pitched tone resembling a steam whistle. History of fracture of the skull two years ago was obtained. Bloody discharge from the ear continued for a few days and a facial paralysis lasted for a few weeks. Before the injury the hearing was normal. At the time of admission there was complete absence of hearing in the ear. Air conduction with a c fork, 128 vibration as negative. Bone conduction, ten seconds, referred from sound ear. C, 2048 vibration, air conduction negative. Three seconds 64 D. V., negative. C, fork over forehead: referred to sound ear. Right ear: fork tests normal. Caloric test: left ear, negative. There evidently had been a hemorrhage into the labyrinth resulting with its complete destruction. The cochlear nerve remaining more or less intact.

CASE II.—J. G., referred to me by Dr. C. Ginsberg, male, age forty-five years, complained of tinnitus in left ear, of high pitched character, worse at night; also slightly impaired hearing. There had been a slight dizziness for three months. Past history was negative; the patient denied syphilis. Functional ear examination: Renne's test positive; shortened bone conduction; lowering of upper tone limits; lateralizes tuning fork to sound ear; caloric test, positive both ears after two minutes.

Despite negative history of lues, because of functional ear examination, I advised Doctor Ginsberg to have a Wassermann test taken. This proved to be four plus. After three months of antiluetic treatment by Doctor Ginsberg, hearing was reported as considerably improved, tinnitus markedly diminished, and attacks of vertigo no longer present.

According to Politzer there are a considerable number of cases of so called vascular entotic noises due to anomalies of the bloodvessels. Among the pathological conditions which he regards responsible for these noises are: dilatation of the arterial branches of the tympanum; anatomical changes in the carotid canal—dehiscences; cardiovascular disease; goitre; cranial aneurysm, especially of basilar artery; and chlorosis. The noises of this origin are pulsating in character, synchronous with the pulse and in some cases may be heard by auscultation over the entire head. The intimate relation of the carotid canal to the anterior wall and of the jugular bulb to the floor of the tympanum may serve to explain the origin of some of the cases of tinnitus especially where dehiscences in these walls are present. Chlorosis is not infrequently responsible for a type of venous blood sound described as a low continuous hum. Cardiac disease, particularly aortic regurgitation, gives rise to a murmur which may be heard in the neck over the carotids and perceived in the ear. A pulsating tinnitus may be complained of by patients having an irritable heart either of functional or organic origin. In those of functional origin trivial causes such as ascending a height of moderate degree may be sufficient to bring on an annoying tinnitus.

Noises in the ear having a neurotic basis are due to an accompanying hypersensitive condition of the auditory nerve and are especially common in neurasthenics. This type of "nervous tinnitus" may exist as a pure neurosis without difficulty of hearing. It is not infrequently observed in those convalescent from some severe febrile affection. In common with most of the symptoms of neurasthenia, this condition is always made worse by mental or physical fatigue so that it is usually more annoying to the patient towards the end of the day. Hall ob-

served a sign which is quite characteristic in these cases, that is, moderate pressure with the index finger and thumb over the anterior edge of the corresponding sternocleidomastoid muscle causes severe pain. According to Kerrison, "Not infrequently, because of the hypersensitive condition of the auditory nerve, the hearing may be abnormally acute, that is, there is a hyperacusis, the patient hearing the tuning fork over a longer period than is normal." It is important to keep in mind that in patients who suffer from tinnitus due to Eustachian tube or middle ear disease, the neurasthenic element is frequently an important factor. E. P. Fowler has made some interesting observations on the influence upon tinnitus of the application of a tight constricting neckband in neurasthenics and nonneurasthenics. The good results obtained in the former class may be attributed to the quieting effect of the band and to an increase in intralabyrinthine pressure.

As a result of his investigations Fowler has established the following interesting observations in chronic catarrhal otitis media with tinnitus: "If closure of the meatus diminishes the tinnitus, the determining factors are slight in extent and easily influenced by treatment, usually tubal. If closure of the meatus increases the tinnitus, the determining factors are due to appreciable extralabyrinthine lesions and the prognosis is less hopeful. If a constricting band diminishes the tinnitus the determining factors are either in the labyrinth or its walls and are due to reflex irritations or to general conditions, such as anemia, neurasthenia, etc., with or without accompanying ear lesion. If the meatus closure and constricting neckband have no effect upon a marked tinnitus, it is difficult to deduce therefrom reliable information, but negative results, if anything, indicate long standing sclerotic conditions rebellious to treatment. If the neckband diminishes tinnitus and increased pressure in the external auditory meatus has no effect, it is probable that extreme ankylosis or sclerosis exists."

Tinnitus, together with other symptoms, as vertigo, deafness, etc., may be due to a chronic degenerative process in the labyrinth and eighth nerve caused by chronic foci of infection. Periodic attacks of tinnitus, vertigo, and deafness were formerly diagnosed Menière's disease and were regarded as cases of primary disease of the labyrinth from hemorrhage into this organ. The characteristic course which these cases take, the chronic progressive nature of the degeneration going on in the labyrinth, the acute exacerbations, often occurring quite suddenly, all resemble so closely the course of neuritis in other nerves when caused by chronic foci of infection, that it seems probable that focal infection may be the underlying cause of not a few of these cases of progressive degenerative processes in the eighth nerve. According to Shambaugh, the sudden exacerbations producing the characteristic Menière syndrome can be accounted for exactly as are the exacerbations in a peripheral neuritis of focal origin, as the result of a fresh shower of bacterial toxins liberated from the primary focus and which for some as yet not entirely accounted for reason selects the eighth nerve as its target.

From the above one can readily appreciate that

the causes of tinnitus are manifold, in fact more so than those which cause deafness. To make an intelligent and successful prognosis and to treat this distressing symptom, it is necessary to determine the cause or causes which are the basis for the condition, to determine the presence or absence of defective hearing, and if the hearing is normal, to determine the functional disturbance of the auditory apparatus which is responsible for it. It is important, in giving a prognosis, to select the facts as to the constancy or intermittency of the noise. The latter type offers a better prognosis, as the causative factor is less likely to be of a permanent nature. Continuous noises may disappear only after the patient becomes completely deaf. Relief following catheterization of the Eustachian tube is a favorable sign. In general the chances for recovery from tinnitus are less hopeful than the hope of relief from deafness.

The alleviation or cure of a symptom which owes its origin to so many possible factors, can only be attained by their successful discovery and appropriate treatment. In other words accuracy of diagnosis is essential. The history of the case should include not only the aural complaint, but every possible general condition which may be of primary or secondary importance should be investigated. A careful and systematic examination of the ear, nose, and throat is, of course, necessary. In cases due to middle ear, or labyrinthine disease, functional testing of the ear should be employed, by means of the voice watch, acoumeter, tuning fork tests—Rinne, Weber, Gellé. Careful functional examination of the labyrinth should also be performed, that is turning, caloric, and galvanic tests, if necessary. If examination of the external auditory canal shows the presence of impacted cerumen, furunculosis, or foreign body, the appropriate treatment is given. In like manner acute or chronic middle ear disease, catarrhal or suppurative, is treated according to recognized methods. It is important to remember that persistent and prolonged treatment is fraught with greater harm to these patients than entire neglect of treatment. A far better plan is to give two or three courses of treatment of a few weeks' duration with sufficient intervals between them. As chronic catarrhal otitis media and otosclerosis are by far the most common cause of tinnitus, I shall briefly refer to those recognized methods of treatment which give more or less relief to these sufferers, confining my attention in a great measure to some of the more recent and largely experimental methods.

In the first place it is necessary to differentiate between these two conditions. The former in the early stages is best treated by attention, operative or otherwise, directed to the nose and throat, together with the proper local treatment of the middle ear. Inflation, pneumomassage, bougieing of Eustachian tube, instillation of a ten per cent. solution of argyrol into the tube, fibrolysin injection over region of mastoid, and hypodermic use of pilocarpine 0.1 grain, are some of the measures in common use in treatment of chronic catarrhal otitis media. A few years ago Heath, of London, suggested the use of cantharides collodion daily applied to the eardrum in cases of chronic middle ear catarrh. This pro-

duces a mild reactive inflammation, temporarily rendering the patient more deaf. He and others who have used this method claim for it excellent results. While considerable benefit may follow the application of the above measures in chronic middle ear catarrh, otosclerosis on the other hand is little benefited by any form of local treatment. Beck comments upon the striking similarity of the spongeifying process in otosclerosis to that of osteomalacia, arthritis deformans, and the bones in the early months of pregnancy. Neuman, Beck, and others have recently reported good results in the treatment of this distressing condition by the administration of adrenalin and thymus and pituitary extracts. Beck, in an extended study of these cases treated by injections of a 1:1,000 solution of adrenalin from one to fifteen minims in gradually increasing doses, believes that progress of the disease was stayed. Others report improvement of hearing and tinnitus. The injections of adrenalin are given every two or three days for six weeks to three months; treatment is then discontinued for a similar period and again repeated. In some of these cases extracts of pituitary and thymus were administered at the same time. All foci of chronic infection, especially of the tonsils and teeth, were removed.

Bruhl and Albrecht, of Berlin, reported in 1914 a series of cases of tinnitus and middle ear deafness in which they had used radium and drew the following conclusions: Radium has no beneficial influence upon the hearing, but it benefits and even cures tinnitus. Radium disturbs the ear nerve mechanism without harming the structure. It relieves dizziness. Sabotky reports the following results in the treatment of twenty-five cases with radium: defective hearing: cured, none; improved, five; not improved, fourteen; worse, six. Tinnitus: cured, one; improved, ten; not improved, twelve; worse, two. He uses a 0.0001 gram radium sulphate applicator, which consists of a small bead about the size of a buckshot, the radium being enclosed in a glass capsule. This is inserted into the ear to the drum, the first treatment being of thirty minutes' duration, the following treatments being gradually increased to one hour. Bruhl in his cases used radium bromide in 0.0002 gram doses, protecting the ear canal with tinsel paper, allowing the radium to remain from ten to thirty minutes, and repeating this treatment in eight days. According to Sabotky, the small doses of radium which he employs have a stimulative effect, causing the resorption of inflammatory products by stimulating phagocytosis and by its influence on the blood supply through its action on the vasomotor nerves. He believes that large doses have a destructive effect upon living cells. Although these results are far from conclusive, they are sufficiently encouraging to point to the necessity for further study and experimental work along these lines.

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THE VALUE OF CHEMICAL TESTS ON THE SERUMS AND SPINAL FLUIDS OF SYPHILITICS.

With Special Reference to the Gordon Mercuric Chloride Test.

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The necessity of having a simple serum test by means of which a rapid diagnosis of luetic infection can be made is obvious. The Wassermann test, although quite reliable, is complicated and requires a well equipped laboratory with an experienced staff of workers. Only large cities or public institutions can afford this. Attempts are constantly being made to simplify the Wassermann reaction or to find a simple chemical test for the diagnosis of syphilis. It is not within the scope of this communication to discuss the simplification of the Wassermann reaction. Briefly, combinations of various substances used as antigens have proved more or less satisfactory for the Wassermann test, although thus far attempts to improve upon a simple alcoholic organ extract have given somewhat unreliable results.

Tests for the presence of specific substances in the serum or tests which will show specific properties of luetic serums are so numerous that from a partial study of the literature on this subject one would suppose that no chemical for a chemical test or combinations of substances used as antigens for the complement fixation test could possibly have been overlooked. The chemical tests may be roughly grouped under four headings: 1, precipitation reactions; 2, coagulation reactions; 3, color reactions; 4, miscellaneous reactions.

Precipitation reactions.—Fornet and Scherschewsky (1) assumed that serum from cases of florid syphilis contained precipitinogen and serum from parasyphilis precipitin. They placed these two reagents together and noted that a precipitate was formed at the line of contact. Other workers have reported this result as inconstant and obtainable with some normal serums. Michaelis (2) obtained a precipitate after mixing luetic serums with luetic organ extract. Klausner (3) mixed luetic serums with distilled water and obtained a precipitate. Later he reported that he obtained the same reaction with serum from other diseases. Butler and Mefford (4) find the results of this test unsatisfactory and nonspecific.

It is a well known and experimentally established fact that in a number of infections the quantity of protein and particularly that of globulin is definitely increased. In some instances, as in pneumonia, although the quantity of total protein in the serum is decreased, the globulin fraction is relatively increased. It seems to find this to be so in similar diseases and kidney infections. The same is true as to syphilis and particularly as to the euglobulin fraction as shown by Noguchi (6) and others. Euglobulin is insoluble at its isoelectric point. This point is reached by sufficient diluting with water.

When the serum is rich in euglobulin it requires relatively less water to precipitate the euglobulin fraction. Thus, Klausner's test shows only the presence of abnormal amounts of euglobulin in the serum. Any serum by a sufficient dilution gives the same precipitate.

Porges (7) and Porges and Meier (8) noticed that luetic serums mixed with an equal volume of a 0.2 per cent. aqueous suspension of lecithin and an equal volume of a 0.5 per cent. solution of phenol in a physiological salt solution gave a precipitate after incubating for five hours at 37° C., and standing for twenty hours at room temperature. Gross and Volk (9) stated that normal serums do not precipitate lecithin suspensions. Stumm, (10) using the Porges method found that serums of carcinoma and sarcoma cases gave eight positive reactions out of ten. Nobl and Arzt (11) confirmed Porges's findings and noticed that Porges's test parallels that of Klausner. Elias, Neubauer, Porges, and Solomon (12) came to the same conclusions. Fromaget (13) used sodium glycocholate in the place of lecithin. There are several other modifications of Porges's reaction, as that of Herman and Perutz (14). They used sodium glycocholate and cholesterol in place of lecithin. Olitzky and Olmstead (15) and Strong (16) found this reaction to be nonspecific and unreliable. Porges's reaction and its modifications will be understood if we consider the protective action of colloids—one holding the other in suspension when the charges are similar, opposite charges having the opposite effect—and the influence of concentration upon the state of a dispersoid. It is a well established fact that from a disperse mixture of nonsolid phases, can be built a system totally or partially solid or, in better terms, a system having solid properties. The colloidal state depends on the concentration and the temperature. Porges's reaction thus indicates a pathological condition of the serum in a general way, but it is not specifically diagnostic.

Coagulation reactions.—Von Dungern (17) found that the heat coagulation of normal serum is prevented by a relatively smaller amount of an alkaline solution of indigo, than is syphilitic serum. Of the 250 serums cited by Von Dungern most of the syphilitic serums tested in this way gave a positive indigo reaction and a positive Wassermann. Some undoubted cases of syphilis gave a negative Wassermann and a positive indigo. On the other hand a positive indigo reaction was obtained with non-syphilitic serums. Flood (18) in his investigation, found that the indigo in the test is of no importance. The alkali is the sole inhibiting agent. Flood could not confirm Von Dungern's findings that with similar amounts of the reagent the inhibition of the coagulation was less marked in syphilitic than in normal serums. In his experience such a difference was but very slight and not constant. He finds that the method is of no value because out of forty known syphilitic serums, coagulation occurred in only three.

Hirschfeld and Klinger (19) reported to the Congress of Internal Medicine at Wiesbaden that they are able by means of a coagulation test to distinguish syphilitic from nonsyphilitic serums. The

reaction depends on the supposed property of syphilitic serums of destroying the cytozymic activity of organ extracts. If suitable amounts of material are applied the coagulation will take place. The authors made about 1,000 satisfactory tests.

Cole and Chiu (20) confirmed their findings with 600 tests. Brand (21), after examining 500 specimens, came to the conclusion that there is a far reaching agreement between the Wassermann reaction and Hirschfeld's coagulation test. In some instances this test is more valuable than the Wassermann reaction. Brand thinks that the frequent coagulation of serums, without the addition of reagents, is due to the faulty methods used in taking or sending in the specimens. The technic of the test is quite as complicated as the Wassermann technic and requires a well equipped chemical laboratory with experienced workers and is really limited to hospital laboratories since the specimen must be tested at once.

Color reactions.—Schurman (22) found that syphilitic serums, active or inactive, oxydized with perhydrol and treated with a modified Uffelman's reagent—phenol, 0.5 c. c.; five per cent. ferric chloride, 0.62 c. c.; water, 34.5 c. c.—gave a dark brown color. Normal serums treated in the same way gave a green coloration. A number of other workers repeated Schurman's work and came to the conclusion that this test could by no means replace the Wassermann reaction. It has been demonstrated that the reaction in question has nothing to do with the pathological condition of the blood. It is an oxydation of phenol by perhydrol. Ferric chloride acts as a catalyst. This reaction takes place only in a neutral solution.

Wiener and Torday (23) found that by adding to 0.2 c. c. of inactive serum 0.8 c. c. of potassium aurocyanate—0.1 c. c. potassium aurocyanate in twenty c. c. of water—and two c. c. of Ehrlich's aldehyde reagent, all serums, with few exceptions, gave a dark coloration. By adding to this mixture acetic acid, syphilitic serums and carcinoma serums show a change in coloration and normal serums do not change. In tuberculosis the reaction is always negative and in nephritis often positive. The authors are not satisfied with the results of their work, considering that only seventy per cent. of syphilitic serums gave a positive reaction and seventy-two per cent. of carcinoma cases were also positive.

Miscellaneous tests.—Baeslack (24) applied the Abderhalden reaction to the diagnosis of syphilis. The test can be applied to serums but not to cerebrospinal fluids. These are always negative. Three chancroid cases gave a negative Wassermann and negative Abderhalden. Out of eight cases of primary syphilis the Wassermann gave in three instances negative reactions, the Abderhalden only one. Eighteen cases of syphilis gave four negative Wassermans, but all were positive with the Abderhalden test. This test was applied to fifty-five cases and certainly this number is not sufficient to justify definite conclusions. Varney and Morse (25) using Abderhalden's reaction for syphilis came to the conclusion that this test is far less reliable than the Wassermann reaction.

This conclusion is not surprising if we consider the recent work of Van Slyke, Vinograd-Villehur, and Losee (26) on the Abderhalden reaction. They demonstrated, applying quantitative test methods for measuring the occurring proteolysis, that nearly all human serums can digest, to some extent, certain coagulated tissue proteins. Landau (27) based his test on the supposed property of syphilitic serums to combine with iodine. With this test, out of ninety cases, forty-nine gave positive Wassermanns and fifty-five positive Landau's tests. In another series he tested by a modification of his own method seventy-seven cases and obtained twenty-seven per cent. more positives with his test than with the Wassermann. Landau concluded that his test is more specific than the Wassermann. Kolmer (28), among others, and Stillians (29) have repeated this work and deny the specificity of Landau's test.

The property of colloids to inhibit in the presence of electrolytes the transformation of colloidal red gold solution into noncolloidal gold solution, is a property discovered by Zsigmondy (30) and has been applied by Schulz (31) and Zsigmondy to the study of colloids. Lange (32) found it to be of great help in the diagnosis of diseases in which lesions are present in the central nervous system. The inhibiting action of different spinal fluids varies. He states that this gives a means for a delicate differential diagnosis. The value of this test for the diagnosis of cerebrospinal syphilis was confirmed by a series of workers, as Weston, Darling, and Newcomb (33), Miller, Brush, Hammers, Felton (34) and others. Miller and his coworkers stated: "No one reaction or group of reactions obtained from the cerebrospinal fluid is pathognomonic of any syphilitic disease of the central nervous system." In their opinion clinical and laboratory diagnoses should influence and confirm each other.

Dr. Alfred Gordon (35), of Philadelphia, gave an account of an extremely simple method of testing blood serum and spinal fluid from suspected syphilis. This test consists of adding five drops of a 1:100 solution of mercuric chloride to 0.5 c. c. of patient's serum or spinal fluid. In normal serum an immediate cloudiness appears rapidly increasing in density and, at the end of ten minutes, presents a thick gray mass with a slightly greenish tint. In syphilitic serum a foamy upper layer forms above a transparent serum. In cerebrospinal fluid the same procedure gives cloudiness in syphilitic fluid, but the normal fluid remains clear. Chylous, or any but perfectly clear, serum, should not be used, since reactions with such serums are very difficult to read.

Ubel (36) gives an account of a series of tests made with the Gordon mercuric chloride method on fourteen unselected cases in the neurological wards of the Erie County Hospital, Buffalo, N. Y. Five tests were made in each case. A Wassermann test was made with serum and with spinal fluid, the cell count and globulin test made with the spinal fluid, and a mercuric chloride test made with serum and with spinal fluid. All tests were positive with three of the five specimens of serum and spinal fluid from cases with positive histories. In one of the remaining cases with a positive history, the Wassermann

and mercuric chloride tests on the serum were negative, but positive with the spinal fluid. A positive globulin test was also obtained with this spinal fluid. One case with a positive history gave a negative finding with all tests, but this patient had had intensive antisyphilitic treatment and a negative Wassermann a year previously.

Ubel does not feel that he can draw definite conclusions from so few cases. He attempts to explain the reaction of mercuric chloride on syphilitic serums and spinal fluids by recourse to colloidal chemistry. He assumes that there is a colloid normally present in blood serum which is not present in spinal fluid. Then, since the addition of a 1:100 solution of mercuric chloride to normal blood serum will precipitate the colloid which is normally present with a resulting turbidity of the serum, he argues that the colloid of *Spirochaeta pallida* protects or absorbs the normal colloid, and hence gives a clear serum when the precipitant is added to a syphilitic serum. In cerebrospinal fluid an exactly opposite reaction occurs: that is to say, when mercuric chloride is added to normal spinal fluid no cloudiness is produced. With syphilitic spinal fluid the spirochete colloid is present and is precipitated by the solution. Ubel's theoretical explanations are not altogether convincing. The reaction may depend upon the hydrogen ion concentration of the serums and might not be the result of changes induced by the *Spirochaeta pallida*. Gordon expects to investigate the chemistry of his reaction.

It seemed to us that the simplicity of Gordon's test made the further investigation of it worth while, and in the latter part of 1915 and early in 1916, we undertook to test, larger numbers of sera by this method than had apparently heretofore been done, and in July, 1916, a preliminary report of these tests was published in *Health News*, the bulletin of the New York State Department of Health. We applied the Gordon mercuric chloride test to 248 unselected specimens of blood serums taken as they came to the laboratory from physicians and institutions throughout the State of New York. The larger number of tests were made on specimens received from various prisons, reformatories, and custodial asylums, since larger specimens of serums were received from these sources than from the average physician, and consequently more tests could be made with them. It was, however, somewhat difficult to obtain reliable histories from inmates of such institutions and this accounts for the large number of cases which will be found tabulated in the negative or no history class.

The Wassermann test was performed on each of the specimens with two antigens with two different periods of fixation and at two different temperatures. The antigens used were a crude alcoholic extract of beef heart with which fixation took place for four hours in the icebox at 5° to 10° C. and a cholesterolized extract of 300 guinea pigs' hearts with which fixation took place for one half hour in the water bath at 37° C. The patient's serum was inactivated one half hour at 56° C. before being tested. A sheep rabbit hemolytic system was used with guinea pig complement. The tests were filled with sensitized cells and readings made as soon as

serum and antigen controls were completely hemolyzed. All the reagents used in the tests were carefully standardized daily.

Since Doctor Gordon did not state whether or no the serums he tested with mercuric chloride were heated or unheated, we decided to make tests on serums treated in both ways. Accordingly sixteen serums were tested heated to 56° C. and also unheated. No difference was observed in the results in ten cases. In four cases the reaction was stronger with the unheated serum and in two it was stronger with the heated serum. One hundred and seventeen tests were made in all with unheated serums. The results of these tests in comparison with the Wassermann tests on heated serums are shown in Table I.

TABLE I.

MERCURIC CHLORIDE TESTS WITH ACTIVE SERUMS
COMPARED WITH WASSERMANN TESTS ON
INACTIVE SERUMS.*

Mercuric chloride	Wassermann		
	Positive	Negative	Doubtful
Heated	9	6	0
Unheated	18	48	15
Doubtful	5	13	7

*Read vertically the results refer to the Wassermann test; horizontally, to the mercuric chloride test.

The tests on the unheated serums were then given up, since in a number of cases it was difficult to procure enough serum for so many tests. Heated, or inactive, serums were always used for the Wassermann tests, so the remainder of the mercuric chloride tests were also made on heated serums. The tests on these serums were read within ten minutes after being made and in a number of cases in twenty-four hours also. One hundred and thirty-four tests were made on inactive serums. The results of these tests will be found in Tables II and III, compared with those obtained with the Wassermann test.

TABLE II.

RESULTS OBTAINED WITH MERCURIC CHLORIDE AND
WASSERMANN TESTS ON HEATED SERUMS.

	Wassermann	Mercuric Chloride
	10 min.	24 hrs.
Positive	42	24
Negative	76	91
Doubtful	16	10

TABLE III.

COMPARISON OF RESULTS OBTAINED WITH MERCURIC
CHLORIDE TESTS ON HEATED SERUMS WITH TEN
MINUTE AND TWENTY-FOUR HOUR READINGS
AND WITH THE WASSERMANN TESTS.*

Mercuric chloride	Wassermann		
	Positive	Negative	Doubtful
10 min.	7	16	0
24 hrs.	27	50	12
Doubtful	6	9	7
Mercuric chloride	3	7	0
10 min.	33	66	16
24 hrs.	3	6	0

*Read vertically the results refer to the Wassermann test; horizontally, to the mercuric chloride test.

As we have stated above, a number of the serums tested in this series were received from persons in reformatories or custodial asylums and in many cases it was impossible to obtain a reliable history of the patient. Table IV gives the relation of such histories as were obtainable to results obtained with the Wassermann reaction, and Tables V and VI respectively those obtained with the mercuric chloride test, ten minute and twenty-four hour readings.

TABLE IV.

RELATION OF HISTORIES TO THE WASSERMANN
REACTION.*

Histories	Wassermann reaction— Positive Negative Doubtful (A number of these were treated)		
	Positive	Negative	Doubtful
Positive	30	21	7
Negative or no history	38	100	17
Doubtful	3	24	8

*Read vertically the results refer to the Wassermann test; horizontally, to the mercuric chloride test.

TABLE V.

RELATION OF HISTORIES TO THE MERCURIC CHLORIDE
REACTION.*

Histories	Mercuric chloride test, ten minute readings Positive Negative Doubtful		
	Positive	Negative	Doubtful
Positive	15	29	12
Negative or no history	14	124	22
Doubtful	10	15	7

*Read vertically the results refer to the Wassermann test; horizontally, to the mercuric chloride test.

TABLE VI.

RELATION OF HISTORIES TO THE MERCURIC CHLORIDE
REACTION.*

Histories	Mercuric chloride test, twenty-four hour readings Positive Negative Doubtful		
	Positive	Negative	Doubtful
Positive	4	12	0
Negative	3	61	4
Doubtful	4	17	3

*Read vertically the results refer to the Wassermann test; horizontally, to the mercuric chloride test.

TABLE VII.

COMPARISON OF PERCENTAGES OBTAINED WITH BOTH
THE WASSERMANN AND MERCURIC CHLORIDE TESTS.

Mercuric chloride	Wassermann		
	Positive	Negative	Doubtful
10 min.	6.5%	9%	0
24 hrs.	18.5%	37%	11.1%
Doubtful	4.5%	9%	4.1%

*Read vertically the results refer to the Wassermann test; horizontally, to the mercuric chloride test.

A comparison of the percentage of the reactions obtained with both the Wassermann and mercuric chloride tests will be found in Table VII. Only 6.5 per cent. of the positive reactions were found to correspond. Thirty-seven per cent. of the negative reactions corresponded and 4.1 per cent. of the doubtful reactions corresponded. These figures give a total of but 47.6 per cent. of the tests as giving corresponding reactions with both the mercuric chloride and Wassermann reactions. Five spinal fluids were tested and the results of both Wassermann and mercuric chloride tests coincided with the histories of the cases. It will be seen from the foregoing tables that the Wassermann reaction still reigns supreme as a serodiagnostic measure in suspected cases of syphilis. Nearly fifty per cent. less positives were obtained with mercuric chloride than were obtained with the Wassermann test, and the coincidence of the result of the test and history of the case was far greater in the case of the Wassermann reaction than that of the mercuric chloride test. Doctor Gordon refers to the difficulty of making readings on mercuric chloride tests made with chylous serum. We eliminated all such serums when making the foregoing tests.

In this laboratory where we are now receiving more than 15,000 Wassermann specimens annually, Wassermann tests are made on all serums sent us save those which are spoiled or very badly hemo-

lyzed. Results of Wassermann tests on chylous serums are not ruled out save when the serum controls are anticomplementary. Then fixation of complement in the diagnostic tubes would indicate a non-specific reaction, and the results are not reported. The differences in the few mercuric chloride tests we were able to make with both active and inactive serums were not marked, but the ten minute readings showed a higher percentage of positive reactions—twelve per cent.—than those made at the end of twenty-four hours, of which about eight per cent. were positive. In no case did the degrees of mercuric chloride reactions parallel the degrees of reactions in the Wassermann test.

Concerning the results of the reactions on the very small number of spinal fluids which were tested we find that the mercuric chloride reaction runs parallel with the usual globulin tests as was the case with three of Ubel's spinal fluids.

CONCLUSIONS:

1. Most of the chemical tests are nonspecific for syphilis. In general they show only a pathological state.

2. In our hands the mercuric chloride test with the blood serum of suspected syphilitics failed to correspond with the results obtained with the Wassermann test in more than half of the 248 specimens studied and thus lacks diagnostic value.

3. With spinal fluids the mercuric chloride test indicates the presence of proteins, but beyond this it cannot be considered specific.

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Suprapubic Prostatectomy.—Norman H. Beal (*The Canadian Medical Association Journal*, February, 1918) declares that this is the operation of choice in the majority of cases of enlarged prostate; that the phenolsulphophthalein test should be employed to estimate renal function; that the two or three stage operation adds a factor of safety; prolonged preliminary treatment is often needed, and the best preventive of postoperative complications is efficient bladder drainage.

AN AIR EXPANSION PIPETTE REAGENT BOTTLE.

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Demonstrator, C. H. Bunting, Jr., University of Pennsylvania, Philadelphia.

Bottles containing chemical indicators, bacteriological or histological stains and reagents, equipped with combination rubber bulb stopper pipettes, are in many instances entirely unsatisfactory. Rubber nipple droppers rapidly deteriorate and crack, rendering the pipette no longer capable of lifting the reagent, and often permit evaporation and concentration or deterioration of the solution. More often the rubber merely loses elasticity and dries out, thus making an imperfect joint with the pipette, causing the same inconvenient results.

The apparatus, to be described, is easily made, practical and inexpensive. An ordinary ten c.c. thin glass ampule of the long stem variety is selected. The stem, after being heated slowly in a yellow gas flame, is drawn out to a taper. The taper should begin about half an inch from the junction of the ampule with its stem, and should be long enough to extend to the bottom of the reagent bottle. The excess of tapered stem can be removed easily after scratching the proposed point of fracture with a file. The end of the tapered stem is now held in the blue flame of a Bunsen burner and rounded off. An aperture 1/32 to 1/16 of an inch is fashioned in accordance with the viscosity of the fluid to be used in the particular pipette. Next select a perfect cork stopper to fit the neck of the bottle to be used; and with a cork borer, perforate the stopper to receive snugly the stem of the ampule. The perforated cork is adjusted on the stem so that the shoulder of the ampule rests against it. The ampule stem, equipped with its cork collar, is inserted in the neck of the reagent bottle as shown in the drawing.



The principle of the air expansion pipette is by no means new, but the use of the ampule is practical, effective, and convenient. By warming the ampule, the contained air is expelled; insert the pipette into the reagent and as the ampule cools the reagent or stain is sucked up into the bulb by partial vacuum. After this initial filling the ampule is always partially filled, and is ready for use. When a few drops of the solution are required, simply withdraw

the ampule from the bottle, and the warmth of the hand is sufficient to expel the desired quantity. When the ampule pipette is replaced in the bottle, it cools and so automatically refills itself. Due to this action, it is never empty, and no evaporation occurs. When larger amounts of reagent are required rapidly, the ampule dropper may be shaken. For ordinary use the heat of the hand usually suffices to expel enough fluid, and the bulb is certain to refill itself for the next service.

BIOLOGICAL LAW AND HUMAN HEALTH.*

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Man, the dominant animal by reason of his intellect, is inferior to lower orders in the animal kingdom in point of health. The lower animal, guided by instinct, lives in closer conformity with biological law and acts with better sense than man. Geology and biology show that the evolution of man, the lower animals, and plants has run along parallel lines since the earliest times. It has been a question always of adjustment to environment and the survival of the fittest by the law of selection and the extinction of species which were unable to meet the requirements of biological law. So runs the history of all life on the globe from the beginning.

Shall man become extinct? It is scarcely believable, but that is the general tendency. Konklin has well said, "No modern race of men is the equal of ancient ones." The hope of the future is this. The instinct that governs the inferior animal is the accumulated ancestral experience of millions of years. He is born with a knowledge of the devouring enemy and his traits; he knows the food that is poisonous and turns from it; all the dangers that threaten are known to him, life is precious, and he avoids them; he follows laws of hunger and of reproduction, commits no excesses that he cannot bear, lives naturally and lives long if he escapes death in the bitter struggle for existence. Man is still governed partly by instinct, but largely by the mind, and his experience in the field of the intellectual life is less by hundreds of thousands of years than the life history of instinct; his advance has been rapid and he has made many mistakes, dancing upon the borderline of death in excesses of all kinds, trampling upon the principles of biological law. The laws of the Creator are immutable and inexorable and there is not one without its penalty, but the hope is that with some ages of experience and the development of science, man will master his difficulties and equal if not transcend the life guided by instinct and attain a much greater longevity.

What are the causes and the processes of man's deterioration? By geological study man has been traced back some millions of years to the paleolithic era at least. It matters little in this discussion how much further we might go in speculation or accumulated evidence, or what or where the proto-

plast; nor does it detract from man's dignity and eminent position or lessen his hope of preeminence in the future to admit the greatest possible antiquity. His life unquestionably began in a very simple form; but his greater adaptability, or some subtle quality of that mysterious force we call life running through all things animate, has enabled him to outstrip the lower animals, many of them on the earth much longer, and to rise far higher in the scale of reason. Responding to external stimulus for millions of years has led to the transformation, probably, from a single celled animal to one many celled and highly complex. This has been proved by Haeckel and many eminent physiologists in revealing the fact that the embryonic life of the animal represents the complete ancestral line in every period of development, one of the most convincing facts being the early white blood period of the fetus representing lower forms. Thus it would seem man is millions of years old when he is born. With man, the highly specialized animal, we are now concerned, and what it is that has enticed or forced him so far away from laws of health.

Life probably began with little other power than the reflex action necessary to procure food and to reproduce the species. As development proceeded, organ after organ appeared to meet the demand of the stimulus of environment until a wonderfully specialized animal resulted. The cause of the physical decline will be found in the imbalance and disturbed function of some part of the delicately adjusted mechanism, most likely in the correlated work of the vegetative nervous system and that marvelous system of organs, the ductless glands. A careful consideration of the structure of these organs and their interrelated function seems to justify this conclusion.

Roughly speaking, the nervous system is divided into two parts, the sensorimotor system and the vegetative neuron system. The second great division chiefly concerns us. The vegetative nervous system consists of two great divisions, the autonomic and the sympathetic. The fibres of the autonomic arise from the brain, the medulla, and the sacral portion of the spinal cord, and supply in part the eyes, the vasodilators of the head, the bronchial tubes, the heart, the esophagus, the stomach, the pancreas, and the intestines; those that arise from the sacral portion of the cord supply the lower bowel, anus, bladder, and genitals. The sympathetic is composed of a cord and a chain of ganglia on each side of the spinal column and three main branches. The first supplies the cranial cavity, the organs of the thorax, the heart, aorta, lungs, esophagus, the abdominal viscera, and the mesentery. The second supplies the periphery and connects with important cardiac branches in the abdominal cavity, the great splanchnic nerve furnishing the gastrointestinal tract and appendages. The third intimately connects the sympathetic ganglia with the anterior spinal roots linking the sympathetic with the spinal cord and brain.

These two divisions of the vegetative nervous system are entirely separate and they are antagonistic in action. It is through this antagonism that a perfect balance is maintained in the work of all

*President's address before the San Antonio Scientific Society, December 11, 1917.

the organs of the body and this is achieved mainly by means of the internal secretions. Health and life itself depend upon this perfect correlated action. Upon it depend hunger, the digestion of food, its distribution to the tissues, and its appropriation to the various purposes in the work of the glands of the stomach and intestines, the pancreas, liver, and other organs concerned in metabolism; the processes of growth, tissue change, waste, and repair; the blood making power of the bone marrow and spleen, the repair of blood cells, and the thousand and one fights made by the blood against infection and poison; the intake of oxygen and the discharge of carbonic acid by the lungs; the excretion of waste products and poisons by the kidneys, the bowels, and the skin; the regulation of temperature, blood pressure, the circulation of the blood, and in fact the control and direction of every organ and every function of the body including procreation, with the one great exception of the mind located in the cerebrum, and it is influenced to a considerable degree by the vegetative nervous system. Even sleep and locomotion and all muscular action is chiefly under the direction of this many sided nervous system. The main purpose of this paper is to emphasize its greatest function of all, that is the cooperative work between the vegetative nervous system and the most wonderful part of the human organism, the ductless glands.

The very seat of youth and age, life and death, is located in this system of organs of internal secretion. A man is said to be as old as his arteries. He is indeed as young as his oldest ductless gland. This system of endocrine glands consists of the pituitary, the thyroparathyroids, the suprarenals, the pancreas, the thymus, the pineal, and probably the spleen in part of its function at least, and possibly some others, all under the control of the master organ, the pituitary body. It is known also that the ovaries and mammary glands and the testicles produce an internal secretion and are closely related to this whole system in its work. In cooperation with the vegetative nervous system these organs each produce a secretion in the body of the gland now called hormones, continually pouring it into the blood stream as required in a wide field of action.

We will briefly describe some of the work of these glands in order to form a conception of their importance. The thymus in conjunction with the pituitary presides over the processes of growth, directing the distribution of suitable material to bone, muscle, nerve, and specialized organ, and ceases its greatest activity at maturity. The thyroid secretion, which is organic iodine, activates all other organs in the various processes of digestion, secretion, excretion, metabolism, and catabolism, and with the adrenal performs a large service through the nerves in conserving the mental faculties. Upon the low functioning of this organ depends stupidity, idiocy, cretinism, some cases of insanity, and many organic diseases. Many backward school children belong in this class and may be easily relieved. The parathyroids, assisted by the pituitary, supervise the enormous part played by calcium in the body, and in connection with the thyroid and adrenals fight extraneous poisons and body poisons.

The pancreas, different from the others, has a double arrangement for function, being in part only an organ of internal secretion. It makes and pours into the bowel through a duct a secretion which digests the fats and aids in other work of digestion, and a part of the gland creates an internal secretion which helps to convert carbohydrates into blood pabulum to be stored in the liver, the blood, and the muscles for energy. One of its most vital functions is to convey through the white corpuscles all remedies against disease, both those generated within and those from without. The pancreas is one of the most serviceable of all the organs and is often overworked and diseased. The gonads, or sex organs, not only furnish a secretion which regulates their own function, but play an important part with the other organs of the system in rejuvenating the whole organism. The pineal gland is little understood, but it is known to inhibit the development of the organs of reproduction till the proper time.

Of all the organs of internal secretion the suprarenals with a capacity of eleven times the daily need have the broadest scope of action. The secretion combines with oxygen in the lungs forming adrenoxidase, which is taken up by the hemoglobin of the red cells and stored in the blood and carried to every tissue of the body, touching every vital process. The waste matter of oxidation is under the supervision of this organ, especially, with the aid of the thyroid and the anterior lobe of the pituitary body. This secretion regulates body temperature and blood pressure, helps to control the breathing centre and the action of the heart, and through the network of sympathetic nerves encircling the bloodvessels increases or diminishes the supply of blood to each organ according to requirements. By its control of blood pressure and the circulation it has special control of kidney function and the action of the skin. In conjunction with the pancreas it controls the glycogenic function of the liver; it energizes the granulation service of the white blood cells in converting proteins and carbohydrates into living protoplasm. It furnishes dynamic energy by stimulating the rich phosphatic nerve sheaths. It fights poison continuously, both internal and external. It is the one great ferment that does its own peculiar work and activates all the others.

The pituitary body, the somatic brain, rules and directs the activities of all the other organs through nerve control and through a powerful secretion of its own. It is the sensitive centre of the vegetative nervous system, the counting house and distributor of nerve impulses directing and regulating the function of all the other organs; the centre of all sensation including pain, the seat of every emotion; the link between the mind brain and that other mind of organic life, the vegetative nervous system. It governs the development of the sex organs, and after adolescence, around this tiny organ situated at the base of the brain, play the sweet fancies and the masterful passions upon which hinge the perpetuation of the race.

These are some of the things done by the ductless glands and the vegetative nervous system, but there is much to learn. We must conclude that here is the vital centre of life, action, health, disease work.

ness, power. May we not even believe that we have here a very complete electric system, which, when operating normally is in harmony with the laws of vibration in a dimension yet undiscovered? Certain it is that most of man's diseases and imperfections in development are due to disturbed function of the ductless glands and the vegetative nervous system. Life is an eternal fight against invading armies of bacteria and other disease producing agencies; the fighting forces have been weakened and the tendency is to retrograde. A large part of this disturbance of function has come from the nerve strain of life. The brain of intellect and the somatic brain are in closest sympathy. We are living too fast; the kinetic drive is too severe. Biological development is slow; our rush in a desperate effort to conquer environment and to live life to the full is greater than we can bear; the evolution of the organism has not kept pace and is not equal to the strain. We have been too much inclined to adopt Omar Khayyam's philosophy and to "Live today while life is ours; tomorrow's naught." We must slow up and correct our method of living and give nature's laws a chance for adjustment.

The burdens of school life are heavy and we contract the hurry habit in childhood, and but little attention is paid to the body and its healthful growth. We rush into business life and exceed the speed limit in everything. Our food is adulterated, often unwisely selected and much of it poorly cooked and we eat far too much; we drink intemperately, forgetting the fact that alcohol is a fictitious harmful stimulant. We are dangerously housed, especially in ventilation. Exercise is almost a forgotten art, and we take self and life too seriously and do not play enough. Is it any wonder that the whole delicate mechanism is upset? Arteriosclerosis, a cellular disease of the whole body, and consequent heart and kidney disease, is increasing to an alarming extent and, according to Sajous, this is due to overaction of the adrenals and the thyroids in an effort to meet the demands laid upon them. Nerve strain leads to imbalance of function; these organs respond and endeavor to do extra heavy work; tension in the blood-vessels rise; the nutrition of the vessel is impaired and the muscle structure is ultimately interlaced with fibrous tissue. This explains most of the cases, but there are other causes, and resistance to disease is weakened all along the line.

We should take off the pressure and conserve our forces; we should make work a pleasure, limit the hours, and play more. We should have careful inspection of food under rigid laws; our diet should be well balanced with less proteins and with less highly refined flour and highly polished rice from which the essential vitamins have been removed, and more fresh vegetables and citrus fruits which are rich in those essentials. We should eat less, and alcohol as a beverage should be cut out entirely. We should walk more; automobiles and other transportation facilities are robbing us of this privilege and hurting us. It would take a volume to condemn sufficiently our housing. We should have the best ventilation and comfortable sleeping porches when possible, so that oxygen may be ample and the adrenal system not unduly strained. A broader

education and the application of knowledge will do a great deal to check the downward tendency of the race.

In individual cases medicine will do much to right the condition. Vaccines, serums, and antitoxins create in the blood antibodies to fight disease, and a similar process is continually going on under biological law, constantly adding to immunity. Chemical remedies to correct errors and stimulate function, especially those that promote alkalinity of the blood, are highly beneficial, and an organ here and there may be aided by special remedies. Organotherapy, the use of the extracts of the various ductless glands, has added much to the treatment of disturbed function of these organs and of the nervous system. The promise of the immediate future in pharmacology is the microscope and the study of biochemistry that is now sounding the depths of a wealth of undiscovered science in that field. Chemical remedies will be found to fight disease and help man back to nature.

The competent osteopath can render valuable service in some cases by stimulating nerve roots, relieving muscular tension, and promoting circulation and by direct manipulation of some of the organs, and the time is soon coming when medical colleges will have a chair on some similar line of practice. Psychotherapy is very useful when the nerves are seriously involved; this explains the excellent results obtained in some cases by Christian science and other like cults. Best of all is to live a natural, temperate, and well balanced life without undue strain. The wise physician strikes a balance in common sense, advises what is best, and cultivates and communicates a spirit of optimism, giving little medicine and much hope, inspiring the nerves; but the great battle must be fought out in the life of the man himself.

Inhalation Treatment in Pulmonary Tuberculosis.—Richet, Brodin, and Saint-Giron (*Presse médicale*, January 31, 1918) have their patients inhale a dry antiseptic vapor. The antiseptic is dissolved in liquid petrolatum instead of water and the air to be inspired passed through the former, thus reaching the lungs in a dry condition. The amount of antiseptic vapor inhaled is regulated by the temperature of the oil in which the antiseptic is dissolved. When of less than two per cent. strength, the amount volatilized varies with the vapor tension, i. e., the temperature, rather than with the concentration of the solution. The inspiration tubes are sufficiently large to ensure a rapid, complete inspiration without effort on the part of the patient. The whole of the air inspired can thus be passed through the antiseptic solution within one to three seconds. The antiseptics used are alternated. They comprise creosote, camphor, phenol, gomenol, iodoform, and turpentine. The method is applicable with any volatile antiseptic. The patient inhales the antiseptics twice daily, for an hour at each sitting. Under this treatment the authors witnessed prompt general improvement, increased appetite, a gain in weight, lessened cough and expectoration in a number of severe cases.

Medicine and Surgery in the Army and Navy

REMARKS ON ORTHOPEDIC PRINCIPLES
APPLICABLE TO WAR CRIPPLES AS AN
AID TO VOCATIONAL OCCUPATION.

Experiences of a Civilian Practitioner.

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Medical Department.

Rehabilitation has always been absorbingly interesting to me. Through all my professional life I have cultivated powers to render this kind of service, and the war will produce a flood of sufferers for whom we must do our best. My hope is to offer suggestions which may prove of service.

After the wounded, injured, or diseased man has had the full benefit conferred on him which the military surgeon has time or opportunity to afford, there yet remain directions and degrees of disability, grades of decrepitudes which unfit him for immediately resuming his former, or undertaking any new occupation. Some of the disabilities are irreparable; other remediable. There is the man's mental attitude toward the episode endured; his conception of his personal limitations (central or psychologic factor), the physical limitations, crippling, in short the damaged motor mechanisms (physical or peripheral problems).

Special guidance is therefore required in order to meet changed conditions, outlook on life, along with training, explanation, reassurance, likewise particularized adaptations at the hands of experts in two chief domains: in psychopathology, by psycho-regulation or psychotherapy, i. e., reconciling the reactions of the creature to a new group of environmental factors, a reawakening and reeducation of earlier mental and physical automatisms and such as shall meet the newly created environmental condition; and, second, the physical limitations, among which are loss of a part, of a sense organ, e. g., a limb, eye, etc.; disrepair of a part, an original function, or aptitude, such as impairment of a joint, of muscle bundles, etc., adhesions, contractures, etc., disarrangements of structures due to interruptions between motor centre and outlying part; also secondary effects due to shock, among which are tremor, contractures, impairment of sensation, loss of power, etc., due to an admixture of psychic and physical inhibition.

There will be obvious need here for using orthopedic measures, not surgical in character, but employment of the same principles of adjustment, and readjustment common to psycho-regulation, psychodiagnosis, psychotherapy, etc. Also there is the problem of the inevitable, the invariably occurring self deceptions, misconceptions, the psychopathies, the bewilderments, fears, anxieties, depressions, due to altered points of view, changed outlook on life, the urgent need for getting on in the world, and for social, domestic, and other readjustments.

A grave situation, deserving of the utmost solicitude, study and tenderest care! One which seems to me the province of those whose training has been

lifelong among neuropathic and psychopathic sufferers. Assistants can be trained to render forms of service suitable to each case provided they are intelligently supervised and directed. Mistakes must be avoided, however, by vigilance; otherwise distressing results follow, permanent invalidism, hypochondriasis, obsession.

Also there is what seems to me the almost equally absorbing problems based on psychomotor or kinesthetic, or orthobiotic, or physiodynamic disarrangements, the crippling, the impairments in the mechanisms from centre to remotest part. Expert care is required in the coordinative possibilities, the adaptations, the compensations, in short the special proficiency problems. Experience teaches that by wisely applied developmental measures it is quite possible to so raise the efficiency or proficiency coefficient as to produce an enhancement of powers over and above previous status. In short, the war cripple "passes through diverse varieties of bitter experiences" which in the final count may redound to his advantage in many directions.

In order to meet these conditions, to solve the clinical, and also the economic problems, it is essential to approach them from the standpoint of biophysics, to learn to think in terms of vitalized mechanics, thought which involves experience in remediation by manipulation, developmental measures which will be more clearly outlined and described in a second paper. So far as I can learn, relatively few physicians display much interest in this, but they must do so now.

There is demanded in the adviser a special aptitude, a type of psychological makeup, deftness, in which kinesthesia, the muscle sense, tactile apperception, motor accuracy, tactile proficiency, etc., are all essential. He must act as guide in training physicians, nurses, and other assistants.

At these reconstructive centres the point of departure, the crisis, is reached in the lives of these heroes, toward usefulness and happiness, or away from active life to nonproductive invalidism. Whether they shall become thereafter valuable members of the community, possibly enriched by their experiences, or discouraged, dependent, shut in personalities, a constant distress to their families and friends, or a burden upon the community, a drain on the resources of the nation, depends on how they shall be safeguarded now. A point of prime importance in the solution of some obscure conditions, obdurate resistances to rational remedies, is the existence of previous abnormal states not recognized or then quiescent. For example peculiar pains, psychic anomalies, over susceptibilities, etc., may often be readily explained by dead teeth, nonsensory root abscesses, dental exostoses, or other focalized sources of sepsis, tonsils, antrum disease, and the like.

These possible local sources of trouble, of baffling obstruction to otherwise perfect measures, are merely cited to direct attention to the breadth of the enterprise. My attention was focused on the dental irritation problems by that enthusiastic pioneer, the late Professor Henry S. Upson, with whom I col-

laborated till his untimely death. In the face of doubt, sneers, and disbelief, the evidence is growing rapidly that here we have an almost unappreciated means of solving obscure problems. It may be that little trouble would have arisen from this or other local irritations until some upset, some shock occurred to the psychophysical equipoise. Of course the man material thus disorganized by trauma is wholly unlike that in average civilian experience. Here is one of a selected group, individually sound, in trained condition at the onset of injury. Not only is he the unit of a highly elaborated status, but there have been sedulously weeded out dubious units, the unstable, the feebly inhibited, the constitutionally inferior, the aberrant demented. Our unique Commission on Mental Hygiene has seen to this. Fortified by knowledge of these facts, the temptation would be to question the possibility of any instances of retrogression in personality and to initiate therapeutic measures from a basis of confidence in psychophysical integrity. And so doubtless it will be found in most instances.

However, mankind in these United States is a complex blend of many races recently fused; the salient characteristics of one or other dubious strain are liable to obtrude—and those proverbially not the best ones which survive in hybrids. Courage, fortitude, cheerfulness, and many admirable attributes are common properties of our people. But docility, patience, equanimity, and that unconquerable determination which bridges over the seemingly insurmountable, can not always be counted upon—in this generation.

Among the injuries which tend to disable, to cripple, to impair industrial efficiency are: Amputation: the part is gone; there may be remnants of available bones, muscles, fibrous attachments, joints which can be brought into the field of motor efficiency, or on which to attach substitutes; apparatus, simulations of limbs, fingers, etc. (prosthesis). Bone injuries, badly united or ununited fractures, conditions of chronic osteomyelitis due to sequestra or foreign bodies embedded in the bone; decalcification, also functional paralysis due to immobilization; this may involve the backbone, hence impairing the mobility, hence the nerve outlets. Joint injuries, immobilities or impaired mobilities, also contractures caused by protracted fixation or to damage of adjacent structures, joints, bony ankylosis, due to obstructions, or painful states in joints, the result of inequalities in the articular surfaces, foreign bodies or infection or other effects of disease, of cold, of damp, of nutrition. Nerve injuries, either complete division of a nerve or nerves in continuity, or nerve terminals embedded in scar tissue, paralyses. Torpidity of cortical, spinal and kinesthetic centres, a part passing from the consciousness of the patient. Tendon and muscle injuries, ununited divisions of fibrous coverings of muscles or muscle masses, loss of muscle fibres by suppuration, atrophies. Deformations of any or all causations or varieties, contractures, scar tissue bindings; paralysis, partial or complete, may ensue capable of being much relieved by simple rational measures; effects of penetrating wounds, of bullet passages, shrapnel bits, with loss of structure, atrophies, etc. Stumps must undergo preliminary treatment, to be

hardened and otherwise brought to a condition for training and for prosthetic attachments. Personal effort must be stimulated, ambition, interest aroused, psychic urgings.

The prime consideration in recovery of temporary tone is to favor the nutritive balance of the cell. This is the key to enhancing the powers of resistance in fortifying immunity. Time is the great healer. Even on the battlefield, "safe conduct of the injured" is ample time to recover from shock, a few hours, a day or two, wherever possible in order to regain equilibrium in cells, in nervous equipoise, in mental easement, in mental poise. Rest is the great pain compensator. Pain unrelieved is the great destroyer. Posttraumatic pains, distresses, anesthesia, are of utmost importance to require constant study. Personally, I learn some new points almost every day.

Immediately after injury the essentials are, among others, safety from further harm, a dry dressing, some fluid food, hot or cold as desired, and ease of posture with the head lower than the body till the blood pressure becomes equalized. Vasomotor equilibrium is of vast significance and especially where, as is usually the case, some degree of shock exists. Heat, hot bottles, and often hot dressings are of paramount value as preparatory for further measures and preventives of infection. So is heat of value in the torpidities of aftereffects, even diathermia to awaken joints, or dry heat by Tynauer's cabinet.

ORTHOPEDIC PRINCIPLES AS A BASIS OF TREATMENT FOR MANY SO CALLED MEDICAL PROBLEMS

PART II.

Orthopedic procedures are restoration of departures from the anatomical norm, including shape, conformation, posture, or equipoise. They are applicable also to a large proportion of clinical problems, especially posttraumatic or postoperative. Self acquired or posture deformations may be visualized as due to such compensatory adaptations as the body is impelled to make by reason of effects (chiefly sensory) of protracted irritation whereby functional equipoise in static as well as motor mechanisms is altered, also they may ensue upon traumata of less or more severity. Posttraumatic or postoperative orthopedics is another matter; differing both as to degree and kind. A large proportion of these self acquired deformations or distortions or disfigurements are so mild as to be scarcely noticeable, and only demonstrated by expert observation or palpation. Many require little more than replacement by passive (manual) or by active directed effort (kinesitherapy). Few, comparatively, need severing of tissues (surgical interference), nor complete fixation, nor immobilization by apparatus. Moreover, many, a large proportion of deformations are due to tonic spasm, to local exhaustion of reactions to pain, to pain reflexes, and disappear upon kinesthetic regulation of activities, especially after localized rest (akinesia), or by suggestion, relaxation, by precise direction, by regulation of psychomotor hypertension, by tactfulness, subtlety, such as diversion of attention, and by substitution. Hence the mind demands adjustment, compensatory and regulatory procedures. To

secure the psychophysical equipoise I find that tactile suggestions must supplement mental suggestions; usually both are needed.

Thus it is evident orthopedic measures may be divided into *surgical orthopedics* and *medical, or better, educative orthopedics*. This latter includes mechanistic, manipulative or biokinetic orthopedics. The main theme of the communication is the educative.

As to the medical orthopedics, this subject is so large as to embrace the whole domain of internal medicine and its abundant resources. Body defenses are to be studied in the light of their status, that is: original, acquired, depleted, or deteriorated. My personal inclinations are toward determining how body defects may be set in order. It matters less how these deformations have been acquired, and to what extent, than it does as to their form and manifestation. Hence the nutritive status always looms large and demands primary attention. Each clinician has his "flair," his point of view, his plan of remediation. All roads, however, lead to Rome—the one goal being constitutional reinvigoration. Through special studies of the ductless glands, the internal secretions, as a pupil of Sajous, I find many problems yield to the light shed by a study of these great autoregulative governors. These functions are capable of at least partial regulation by means of the several forms of orthopedics.

By the term mechanistic, manipulative, or biokinetic orthopedics, I would postulate:

Man, after all said and done, is a sentient mechanism; very sensitive, capable of self regulation, and, to a great extent, of self repair, suitable conditions being supplied. None the less is he a mass of biophysics, a congeries of static, mobile, interacting motor and psychomotor mechanisms, among which are: framework, tubes, fluids, containers, pumps, distributing channels, reflexes, muscles, bellows, gases, cells, and reservoirs of energies.

Personal tastes, training, and experiences have led me to keep in mind the mechanistic concept quite as significant and practical as any other. When the psychic status is pretty well grasped, gauged, and the internal processes, biochemical, nutritive, and respiratory are fairly assessed, it does seem to me we are in a position to give equal attention to the makeup as a whole. Here the body as an engine for the generation and the transmission, transformation, application and elaboration of forces, deserves attention.

We are told by those surgeons who have had experience in the war zones that practically all treatment of injuries comes within the strict interpretation of orthopedic remediation. The attention bestowed on the wounded or shocked requires from the very first special care in replacing the injured parts in the most favorable attitudes, and in immobilizing them during the jars and jolts of transit and often after reaching the base hospital. Then throughout the treatment adjustment, adaptation, and compensation is constantly needed not only to prevent subsequent deformity, but to defend the integrity of the parts and preserve their functional competence.

Hence it is desirable that our students of medicine those who may soon or late undertake military

service—should be given particularized instruction and training in *principles of orthopedic prevention, remedies, and reconstruction*. Much progress, so it seems to me, could be made by standardizing, by systematically grouping, all therapeutic agencies and measures. The fact is being made plainer every day that the principles on which these are based interdepend; that they interact helpfully. Experts in one or the other line should be encouraged to cooperate from start to finish.

It is eminently proper that one or the other of the remedial groupings now recognized should be presented consistently and completely by experts in one or other department, but that the point of contact each to the other deserves to be indicated in such wise that proponents of any one method could be better able to link up with the others in scientific or logical associations. Experts in one of these sharply defined systems can not be expected to know much about some of the others, but they should at least know and be able to define where one department ends and another logically begins, for, obviously, no one system as at present recognized or claimed contains enough to satisfy all demands.

A promising form of specialism might be organized based or arranged upon one or other method of approach, constituting a full *system of therapeutics*. There should be included a fair proportion of the well verified principles and methods of all the others. Details could be elaborated, spun fine, as separate enterprises. The purpose of this communication is to offer a grouping for consideration, the basis for which is self regulation. This gives promise of furnishing a comprehensive concept capable of becoming elaborated into an acceptable system of therapeutics which may suffice till a better one is devised. This system, proposed and used for some years in my lectures, is entitled, *Reconstructive Therapeutics*, and includes consideration of all those remedial agencies other than drugs, medicines, bacteriologic preparations, serum, etc., which are introduced into the body. I habitually point out, as near as my knowledge permits, where the efficacy of one ends and the other must be employed.

My particular purpose here, is to direct attention to certain *common denominators*, or elements common to a considerable group of restorative agencies which act through systematizing and teaching anatomical regulation. To these may be applied the term *orthopedics*. By orthopedics we postulate the prevention and correction of deformities. These deformities are perhaps describable as disturbances of adjustment, or dissonances, inequalities, compensations, imbalances, neutralizations, or nullifications. They produce confusions, and are evidenced by functional perplexities, involutions, entanglements, turmoils, agitations, discords, anomalies, disorganizations, down to chaos. They are not diseases, but are exhibited as diseases, not only in chronicities, but more or less in acute disorders.

The outstanding feature I would emphasize is the element of orthopedics as applicable to most clinical problems. And first of mental orthopedics. Such a welter of psychotherapeutic "systems" are afloat, surging through all grades of social and religious doings, that some confusion must prevail both

in the profession of medicine and even more among the laity who range themselves in groups of proponents or protagonists or adversaries. Many points of resemblance are shown to the ecstasies and subjective mental distortion of religious prejudices. These partisan advocates or proponents stand in detached groups, each enthusiastic as to the peculiar merits of what they chose to endorse as the one "means of salvation." Having floundered through the mysteries of several, the chief, perhaps, of these cults, from old fashioned faith cure to psychanalysis, taking a fling at Dowieism, Christian Science, New Thought, and the like, I am acquiring a stable equilibrium and coming to my senses by reverting to the teachings of my revered chief, the late Weir Mitchell, and, more recently, by several illuminating visits for days at a time, at the Psychopathic Institute of my friend, Boris Sidis. Through the methods of both these master minds certain common denominators are plainly distinguishable, thus crudely described:

After learning all one can of the significant points in the history of the patient, which means much more than collecting all the symptoms, earlier experiences among sick beds or physicians, or the data available through laboratory tests or therapeutic workouts or "proving," there remains much to acquire as to the manner or type of human being which confronts us, judged by his earlier upbringing, his native (inherited) trends, tropisms, environmental quirks, his psychic and moral vulnerabilities, also how, where, and when they got their thrust off from the right or profitable directions. Also, how they now live, work, play, devote their energies to, and what they now believe, and why. In brief, where they not only stand, but "get off."

All this helps much, but one measure, too seldom practised, remains to put to use. That is to make companions of the patients, live with them—see them in their daily life as much as can be, *e. g.*, eat with them, walk with them, drive with them, sit and dawdle, if possible, more or less. By such means—and even a busy man can find time to compass the ambit—the creature is revealed as he is. Then, and not till then, can one begin to evaluate the factors, and to carry out a consistent campaign.

For the rest, for the particular measures applicable to each, we may safely leave to the trained experience of any competent medical man. The problem then becomes one of disentangling of the real from the unreal; the significant from the insignificant; the implantation of the word in season; a campaign of doings, and equally of *not* doings. The problem will become gradually reduced to certain simple but important ingredients capable of being worked out by common sense and the limitless resources of medical science, including always the highly qualified specialists who are available.

Throughout the whole process—which, by the way, is not nearly so complex or time consuming as it sounds—every act, every suggestion, every recommendation, every rebuke must be correlated with the bewildered mind, volition, capabilities of behavior of the patient. Self regulation is the keynote. Unless this is established as a governing principle, no cure will be complete or permanent.

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NEUROPSYCHIATRY AND THE MOBILIZATION.*

By PEARCE BAILEY, M. D.,

Washington, D. C.,

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Lieutenant-Colonel Bailey, in beginning his address, said that when reports began to come in of the mobilization, they seemed so important in relation to civil medicine that he had at first conceived no more agreeable way of passing his declining years than in applying the results obtained from examinations in mobilization to civilian uses, but that time had not yet arrived. The war had assumed an aspect of such unparalleled ferocity that it was out of the question for anyone to get his thoughts very much removed from the actual issues at hand, which were the care of the army as it exists and provision for the universal army that must be built up. So the idea the speaker had of endeavoring to point out what neuropsychiatry had taught in regard to civil problems had been somewhat overshadowed. The address to be given would be a mixed one and directed toward several objects, namely the neuropsychiatric work done in the army, the larger problems that had arisen, and which had made a new chapter in experimental medicine, and some application of the statistics as they affect the civil community.

Medical men of various leanings in the army had been occupied for the past year with humanitarian functions, but they had also been laying the foundation of future prevention of disability and disease. Neuropsychiatrists had also, by determining the physical and mental fitness of American youth, and by recommending the disposition of those not fit for the full ardors of war, accumulated information which would be incorporated in the creation of new social and political policies after the war. Even now the results of the examination of a million men by the most skilled diagnosticians in this country had proven that modern medicine, quite apart from its military significance, was an indispensable factor in practical matters.

In speaking of the advance of medicine in connection with war, progress in surgery and sanitation was naturally the first thought. But, quite aside from these requirements, new problems in neuropsychiatry had arisen. New symptom groups had appeared which constituted a field hitherto unexplored; those suffering from them did not seem to be actually ill, but did not possess full adult efficiency, and strong neurotic trends ran through all of them. One of them was bed wetting, the frequency of which in healthy adults made it seem like a situation neurosis. Many of the other neuroses common among troops doubtless had association with physical causes, especially with such diseases as rheumatism. One of these consisted of deformity of the back after exposure to shellfire in France. But it occurred here in the camps where there was no shrapnel or bomb explosions to account for it. Here, then, was an underlying psychological factor in association with rheumatism.

In another group were the states of hyperthy-

*Abstract of an address delivered at a meeting of the New York Academy of Medicine, April 4, 1918.

roidism, called by the English the "effort syndrome," the individuals being all highly neurotic. Another problem which linked various branches of medicine and offered opportunity for refined diagnosis with practical ends came from the study of the types of personality of aviators. A high percentage of accidents in aviation came from the fact that the aviator was not physically fit, though he might have passed the most rigid routine physical examination. To determine these conditions beforehand, the most ingenious methods of examination had been devised by a medical research board. These tests, which were bound to increase the efficiency of the flying corps, were also destined to become of great value in the whole realm of medicine. These were all problems which the civilian physician had no such opportunity as those in the army to study.

Another result of the mobilization destined for future use in civil needs was the new psychological method which had been devised for the rapid determination of mental defects among drafted men, national guardsmen and volunteers. A group of psychologists combined with the neuropsychiatrists had devised these psychological tests by means of which the extent of mental deficiency could be determined in large groups of men in a short period of time. Those found defective to a degree to make their usefulness as soldiers improbable were recommended for discharge through the psychiatrist. In possession of the intellectual ratings of the men not sufficiently unfit for discharge, line officers could assign them to duties where their degree of ability was adequate for efficient and safe service.

A great practical advantage that had accrued to the medical profession as a whole in the present mobilization had been a closer cooperation between the different branches of medicine than any hitherto known. By working together throughout the cantonment hospitals, all had gained a wider knowledge of specialties other than their own, realizing their separate value to the service. Never before had the significance of nervous and mental disease been so emphasized as during the past year. It was very important for the effectiveness of an army as well as for the financial welfare of the country which maintained it, to exercise a discriminating scrutiny of the nervous integrity of its soldiers, particularly while the army was being trained for an expeditionary campaign. Examinations in America had been systematically carried out since the beginning of the present mobilization by three methods: examination by boards, by surveys, and by individual tests. It was confidently believed that the steps taken to keep neurotics from military service would result in a smaller proportion of casualties of nervous type as compared with other armies. But it could not be expected that nervous and mental diseases would be entirely negligible quantities in the American expeditionary force; all troops that left this country before September 1st, 1917, were not examined from this point of view, and, in addition, foreign service always took especially heavy toll in this direction. In addition to preventive measures instituted with the troops in training, steps had been taken to ensure a smaller proportion of nervous casualties with the troops abroad by having a neuropsychiatrist assigned to every medical division in

France. Few of the nervous collapses which occurred at the front did so without warning, and it was believed that many of these individuals, under specially skilled observation and treatment, could be restored to a stable condition before complete breakdown occurred.

The statistics showing the results of the neurological and psychiatric examinations in the camps were an indication of the incidence of these particular diseases in a selected portion of the community at a given time. Out of one million men, several thousand had been discharged, the largest factor being mental deficiency with epilepsy running almost parallel. Next in order came psychoneuroses, constitutional psychopathic states and dementia precox. These five represented a congenital condition of the nervous system, and the importance of these figures lay in a political point of view. The drug situation was a very interesting one, there being three great centres of drug addiction: on the Atlantic seaboard, on the Mexican border, and on the western seaboard with its trade connection with China. Hyperthyroidism had a high rate and syphilis had a varying percentage. Great progress had been made in the alcohol question in this country, so that alcoholism in the army was practically a negligible factor.

One could not look at the figures showing the number of imperfect persons assembled for military service without wondering what was to be done with or for them. The reconstruction thus considered came under two heads: First, for military service, and, secondly, to meet the ordinary requirements of civil life. In the realm of nervous and mental diseases there were few if any which were susceptible to treatment so as to make service at the front possible. Civil life, on the other hand, made less strenuous demands, and many nervously unfit for war were able to carry out the lesser exactions of civil life. It was in helping this class that a closer cooperation between the army and civil authorities would be established. There was every reason to believe that reconstruction of many of these men to normal lives and activities could be accomplished, particularly while they were still amenable to military authority. A great deal could be done for drug addicts under this condition. The ideal plan, and one likely of accomplishment, was for the Federal Government to supervise reconstructive activities organized by civil or state authorities.

The results of this war would have to be a reconstruction of national policies to insure a higher standard of public health. It would be imperative for the Government to have accurate knowledge of the health of the people; to be put in possession of facts concerning the birth rate, death rate and the diseases of the different localities. Further, it must have power to so influence individual States to take care of these problems that the results would be serviceable to the nation as a whole. The beginning of this reposed in the Federal Public Health Service, but its powers and functions must be greatly enlarged in order to obtain the end in view. The importance of the function of the American medical men had been taught in large letters as a result of this mobilization and the principles of medicine had been an imperative necessity in the establishment and maintaining of the national army.

MEDICAL NOTES FROM THE FRONT.

To the Editors.

GENEVA, March 16, 1918.

Quite recently Monsieur Clémenceau was at the front in an Alsatian village where he found an old "pal" whom he had not seen since the days when they were medical students together. You probably know that the French Premier was originally a disciple of Esculapius, like ourselves. After the usual exchanges of good wishes the two old gentlemen began to recall memories of bygone days.

"It always gives me pleasure," said the President of the Council of France, "to recall that I was at one time a physician. . . . But I now have no patients!"

"But, my friend, you are still a doctor," replied the old friend, "because just now you have to give your professional attendance to France and dress her wounds!"

And that same evening, at dinner, M. Clémenceau admitted to those with him at table that these words of his oldtime companion had deeply touched him.

Quite recently Dr. G. Leclerc has put on record a series of eighteen cases of secondary excision of the elbow joint, done for septic arthritis, the result of injuries of warfare. In sixteen of these cases the end of one bone only was resected, the remaining two being complete excisions of the joint. In fifteen cases the immediate result was quite satisfactory, particularly so, since the septic phenomena disappeared in about ten days' time, but in two other cases the septicemia continued and amputation was done in one, but both died.

Leclerc was able to obtain the ultimate result of his cases after the lapse of one year. One was perfect functionally at the end of that time, in another active motion to the extent of from 100° to 135° was obtained, in eleven others there was ankylosis in good position, while in two others a flail joint resulted, but with very satisfactory motion for all that. Leclerc prefers excision to arthrotony with removal of the bone spicule, because, as he rightly maintains, this interference does not call a halt on the extension of sepsis and usually exposes the limb to muscular atrophy or even sclerosis, while the joint itself is subjected to persistent fistulæ.

I would point out that flail joints are the ultimate outcome in some cases of excision undertaken under conditions that would seemingly justify amputation, and is likewise the result of excisions performed on limbs in which long standing suppurative processes have resulted in both atrophy and sclerosis of the muscles. This untoward result can, however, be usually eliminated if the surgeon will only resort to primary excision of the joint, as taught by Leriche and other members of the Lyons school, because, by so doing, the muscles retain their vitality and therefore maintain their vitality during convalescence with the result that the limb is functionally restored.

In two cases of fibromuscular cicatricial contracture of marked degree Thévenet, at the Aix Hospital, has obtained really remarkable results by excision. The first case was a retraction of the forearm, due to a septic process, with consequent loss of motion of the hand. A typical excision of the wrist joint was done with the result that complete movement was restored with the exception of the

index finger, which was paralyzed from injury to the median nerve.

The second case presented a flexed thumb, the result of cicatricial contracture of the thenar eminence. The head of the first metacarpal bone was excised, the thumb recovering its movements.

It is to be pointed out that in the first case excision of the wrist was resorted to because experience gained during the war shows that this operation gives very good results and can be relied on. Excision of portions of the long bones in order to overcome muscular contractures in such cases, which are far from uncommon, is apt to be followed by delayed union or a distorted limb.

Some very interesting work has been done by Dr. P. Japiot, chief physician to the Surgical Group, No. 76, in x ray examination for surgical and prosthetic treatment of fractures of the inferior maxillary bone involving the teeth. Japiot has examined about 1,000 cases and finds that by simple inspection of the mouth it is quite impossible to detect the real lesions of the teeth and only carefully taken radiograms will solve the proper course to pursue in many cases.

He has found that the presence of fragments of teeth lying between the fractured ends, thus preventing union, can be readily distinguished in the radiogram from bits of projectile. The fracture may involve the socket without injury to the tooth itself or may conceal a wisdom tooth undergoing its evolution, the presence of which often causes untoward secondary complications.

The teeth themselves occasionally act as foreign bodies, being projected into the base of the tongue or neighboring soft structures. Therefore, an immediate skiogram will show exactly the damage done and by early removal these teeth infectious processes will be avoided. In not a few cases of ununited fracture of the jaw, or in cases of persistent fistulæ after union has taken place, a dislodged tooth or a fragment of one has been found and by removal an uneventful recovery ensued.

Bacteriological and clinical experiments carried out at the Hospital of the Polytechnic School of Paris since the latter part of 1914 have shown the surgeons connected with this institution that there is no single method of disinfection applicable to all wounds, but on the other hand a specific action of certain antiseptic products in relation to a specie or a group of bacteria seems to be fairly well proven. For this reason, the systematic use of antiseptics according to the microbic flora in wounds has been worked out. Daily bacteriological examination of the secretion from a wound, submitted to the action of a given antiseptic, has led to some quite positive data, and in particular the use of commercial Javel water diluted to fifteen parts per thousand.

Five hundred and ten cases of war injuries have been treated with this antiseptic. Of these, there were 155 compound fractures with great destruction of tissue and more or less extensive necrosis of the tissues; some of these fractures involved the joints. There were 286 very severely infected wounds of the soft parts, great laceration of the muscles occasionally with division of important vessels and forty-four cases of amputation performed at the front and then evacuated to this base hospital.

These were infected cases and in very bad condition, both general and local.

Of these 510 cases only three died, one patient, with a compound fracture of the left humerus and multiple wounds in the back from exploding shell, died of tetanus a week after being admitted. The second fatal case was a compound fracture of the leg in a very high degree of infection, died forty-eight hours after amputation. The third came in with icterus following multiple injuries to the pelvis and lower limbs, death taking place ten days later.

A comparative study of Dakin's solution, Dufresne's solution (sodium hypochlorite C. P.) and Javel water diluted to fifteen parts per 1,000 shows that the latter possesses very active bactericidal properties and is well tolerated by the tissues. These clinical results in 510 infected cases treated with the diluted Javel water prove, it would seem, that this antiseptic has an equal, if not greater, bactericidal action than Dakin's solution and in particular has an action of almost specific nature on anaerobic organisms. CHARLES GREENE CUMSTON.

tion will have the cooperation of the Department of Labor.

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The War Department is still considering questions pertaining to the authorized strength of the regular army as affecting the allowance of medical and dental officers of that branch of the military establishment. Upon interpretation of the law as finally made will depend, of course, promotions to be made in the medical and dental corps.

Pending legislation making certain reorganizations in the medical service of the military establishment and providing many more officers of high rank, as embodied in bills introduced by Senators Owen, of Oklahoma, and Shields, of Tennessee, these bills have been the occasion of animated discussion at the Capitol. The opposition of the War Department to both measures, and notably to the Owen bill, has had the effect of postponing approval of the legislation by the Senate military committee. At the same time, considerable pressure has been applied, mostly by officers of the Medical Reserve Corps, to secure congressional approval of the measures.

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MEDICAL NEWS FROM WASHINGTON

Bill for Rehabilitation of Injured Soldiers. The Allowance of Doctors and Dentists for Each Regiment. The National Board of Medical Examiners.—New Buildings for Laboratory Work.

If a bill relating to the rehabilitation of injured soldiers and sailors now pending before Congress becomes law, as it is expected, this government will be in a position to render the same useful service to its disabled fighting men which is being performed with such conspicuous success by most of the other belligerent countries. This bill, which was prepared by the Federal Board for Vocational Training, provides the machinery for carrying out the plan of the vocational rehabilitation of injured men.

All medical and surgical treatment necessary to give functional and mental restoration before the men are discharged from the military and naval service will continue under control of the War and Navy Departments. However, in order to simplify the work of rehabilitation, and to reduce the personnel to a minimum, it has been decided that the medical and hospital treatment of injured sailors shall be furnished by the medical department of the army. In fact, a number of disabled sailors, notably blind men, already have been turned over to the army medical authorities for the course of prevocational treatment specified for soldiers.

While the men are under treatment, they will continue in a full pay status, including the family allowances provided in the war insurance act; but, if a man fails or refuses to follow the prescribed course of vocational instruction, any or all of his monthly compensation may be withheld.

An appropriation of \$2,000,000 is included in the bill, which covers the employment of teachers; the cost of necessary facilities for conducting the schools, the travel, lodging, and subsistence of disabled students in pursuing their training, and of placing the rehabilitated men in gainful occupations. In the latter object, the board for vocational educa-

Following visits of its members to the medical officers' training-camps at Fort Oglethorpe, Ga., and Fort Riley, Kans., the National Board of Medical Examiners conducted examinations at those camps commencing on April 9, representatives of the board being at both during the simultaneously conducted examinations, which were held under the approval of the Surgeon General of the Army.

There are about 2,500 medical officers constantly under training at these camps, including very many of the high class of young men the board desires to reach. The average age of one student battalion of 700 medical officers, recently analyzed, was about thirty-two. The professional qualifications of these younger men are especially good.

Examination by the National Board of Medical Examiners, and its certificate of proficiency, now accords to those who qualify the right to engage in medical practice in fourteen states without the necessity for undergoing local examination by state boards. Fourteen more are expected to offer similar concessions as soon as their legislatures meet, and opportunity is had to amend the laws accordingly. Others, doubtless, will follow. Subject to physical examination and grading for aptitude, qualification before the national board is accepted for admission into the medical departments of the army and navy and the Public Health Service.

Steps are being taken to secure reciprocity as to medical examinations with Canada; and, if the present examinations warrant it, it is contemplated to hold examinations overseas with a view to impressing the medical authorities of Great Britain and France, and securing therefrom reciprocity entitling approved candidates to practice their profession in those countries.

In the readjustment of the medical profession that inevitably will occur during and after the present war, many medical officers doubtlessly will change their residential state or country and desire to establish themselves elsewhere.

Editorial Notes and Comments

NEW YORK MEDICAL JOURNAL

INCORPORATING THE

Philadelphia Medical Journal
and the Medical News

A Weekly Review of Medicine

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NEW YORK, SATURDAY, APRIL 27, 1918.

THE THIRD LIBERTY LOAN.

On April 6th the President of the United States opened the campaign for the sale of the Third Liberty Loan bonds with an address delivered in Baltimore, which is a scorching indictment of the men who act for Germany, of their aims and of their deeds. The conduct of the Germans in Russia has confirmed the impression made by their conduct in Belgium. Germany has declared by word and deed that force and force alone shall decide this war. President Wilson in his address said that "There is but one response possible from us: Force, force to the utmost, force without stint or limit, the righteous and triumphant force which shall make right the law of the world and cast every selfish dominion down in the dust."

The German troops have launched one attack after another against the Western front, the Allies have been driven back step by step, but seem at last to have made a stand. The Germans have been slaughtered by the hundred thousand, French, English, and Italians have been killed by the tens of thousands, and Americans by the hundred. This is no time to talk. Every muscle should be taut and

every nerve tense in immediate, decisive action. Our men must be hurried to the front whether trained or untrained. We must have men and still more men. There is talk of a call for a million. Why deal in retail quantities? We should call out five million. Better far to call out a million more than we need, than that we should fall a thousand short. Let the rulers of Germany know that they are not dealing with a "contemptible little army," but with the full force of American manhood.

And to carry on this war, to mobilize these men, to provide ships and food and clothing and munitions, money is needed—vast sums, incredibly vast sums, sums beside which the most gorgeous imaginings in the Arabian Nights pale into insignificance. The American people must furnish this money and it is a cheap price to pay for protection from the imposition of the Prussian yoke upon us; a small price to pay for the preservation of that liberty for which our forefathers fought, suffered, and died. Every man among us, every woman, every child, must do his or her part to provide the men and means to carry on this war.

The members of the medical profession have contributed 19,057 of their number to war service, as shown on their splendid service flag opposite page 792. Half as many more have served on exemption boards without remuneration. Practically all have been called upon for additional service because of the absence of so many practitioners in the army. But there is still left a service that the medical profession can render, and render to their own advantage. They can subscribe to Liberty Loan bonds, thus furnishing the funds to equip our armies in the field and at the same time making a safe and sound investment.

Two of the greatest leaders in medicine, Dr. Abraham Jacobi and Dr. Robert T. Morris, tell on another page what the Liberty Loan means and why the doctors should subscribe to it liberally. These papers form a unique contribution to the literature of bond selling.

Our advertisers have likewise done their part in donating space to the Liberty Loan Committee for the advertising of the third Liberty Loan bonds. Thirty-three pages of these advertisements form a special advertising section in this issue. The advertisers represented have each donated a page for use by the Liberty Loan Committee as an evidence of their desire to aid in the selling of these bonds. We hope that this appeal to the members of the medical profession who are unable for any cause to

go to the front will have a most generous response, for as is said by the publishers in that section, "The men who subscribe to these bonds will make a sound investment, with the biggest and best security behind it ever offered; the pledge of 100,000,000 free people and the security of 3,743,318 square miles of the most fertile, the richest, and the most diversified country in the world, the entire United States and its possessions."

A CRISIS IN PUBLIC HEALTH ADMINISTRATION.

To those who have felt at times a lack of confidence in the ability of the lay press and public to interpret intelligently modern ideals in medicine and public health, the storm of protest which has been aroused by the methods pursued in the recent investigation of the Department of Health of the City of New York is certainly reassuring. Facts of far greater importance than the mere findings of a Civil Service Commission have been clearly established. The public has demonstrated beyond the shadow of a doubt that it has a knowledge of public health service and confidence in officials which augurs ill to any attempt to lay violent hands upon the Health Department of the city. It has established the fact that in municipal administration as in national administration, the days of secret diplomacy are done.

From an inquiry begun on April 9th with the avowed purpose of "reorganizing" the Health Department for purposes of economy, a graft hunt developed. Not to be thrown from the scent by the red herring of graft, the city and county medical societies, as well as other health and civic agencies of the city, have continued to demand full publicity of the proceedings of the investigating body—not as to graft, which is quite properly a matter for thorough investigation by the District Attorney—but as to motives and aims of the investigation in "reorganizing" a Health Department of recognized and proved efficiency.

Forced by an evergathering storm of public indignation against what was considered Star Chamber proceedings, the Civil Service Commission announced on April 20th that succeeding hearings of

the investigating body would be open to the public. With this announcement came the publication of a preliminary report on the findings of the investigators, which was submitted to Mayor Hylan. This report reviews briefly the evidence as to graft in the Health Department and sums up its graft allegations in a sweeping statement that there exists "a smooth running graft agency . . . that has been operating with impunity in the Health Department for many years." These allegations of graft, now in the hands of the District Attorney for his investigation, remain to be proved. Physicians and the general public will, of course, be fully as insistent in demanding that graft be routed out of the Health Department as in demanding that efficiency be kept in. Thus far, as reported in the press, evidence has been secured by the District Attorney that two food inspectors are involved in the collection of \$12,000 for permitting sale of oysters from polluted beds. Further findings of the District Attorney will no doubt be made public in due course.

The only definite recommendation, for reorganization of the Health Department, which appears in the report of the investigating body, is that the Bureau of Public Health Education should be abolished, on the ground that it is "useless" and merely the "press agent" of the department.

Such characterization of a most essential unit of the Health Department's work indicates clearly a lack of understanding of modern public health thought and progress on the part of the investigators. Two public hearings on this proposal have already been held and without a dissenting voice the physicians and health workers of the city have evidenced not only their disapproval of the proposed change, but their demand for broadening rather than curtailing the Health Department's educational work.

If against the advice of such authorities in public health affairs as Dr. Abraham Jacobi, Dr. S. S. Goldwater, and Dr. James Alexander Miller, the Bureau of Public Health Education is abolished, it is certain that the confidence of the majority of physicians of New York city in the wisdom and vision of the Mayor will be wrecked beyond repair.

As Doctor Goldwater pointed out, at his appearance before the investigating body, it is daily becoming

FROM THE SECRETARY OF THE TREASURY.

*New York Medical Journal,
66 West Broadway, New York:*

The medical profession of America has made a splendid record in volunteering for service in the army and navy and in volunteering for work on the exemption and advisory medical boards. Those of you who have to stay at home can also serve by subscribing to the Liberty Loan.



Washington, D. C., April 20, 1918

ing more difficult to secure physicians of ability for public health work because of investigations of this kind and because of the greater compensation offered in other fields. We can ill afford, in this time of stress, to permit the "scrapping" of essential parts in our health machinery or the dismissal of efficient public health servants.

Let us hope that the administration will be warned in time and that the selfsacrificing efforts of physicians and public health workers to build up a Health Department which stands as a model in this country will not be set at naught without due consideration.

PSYCHOPATHIC CONSTITUTION OF RADICAL INDIVIDUALS.

The mental and physical makeup of the so called radicals, especially with their neurotic, neurasthenic, hysterical, and hypochondriacal tendencies, has long been recognized by most physicians. That the public is but now awakening to their presence and possibly to their real significance in view of present conditions, is no credit to their powers of observation. At present this radical type who sets himself at crossroads with every purpose of the public has aroused a good deal of public animosity, an animosity that must fade if such radicals are considered as precocious and constitutionally inferior. That their ideas and notions are at times sound does not detract from their pathological personality. Usually, however, they are more self absorbed in the impression they make than in any public good that may follow their loudly spoken views. Their intolerance of other's views is but another expression of self. The mere fact that this radical element harbors a few geniuses, or even that all of them are geniuses in their own way, does not detract from their typical egotism and exhibitionistic tendencies. Their genius, however, is usually nothing more than precocity along nonconstructive lines. Their ability is far more acute in destructive imagination; they are iconoclasts incarnate. That it is time that the mental makeup of the radical be inquired into is not to be wondered at, since there is no phase of life or of society in which the question of mental constitution does not intrude itself in trying to work out either motive or technic. And the analysis of the radical cannot but yield an abundance of psychopathic material.

Most of the radical type, whether of the artistic, social, or political type, are plainly of inferior physical stamina. This accounts for the

fact that, instead of utilitarian, their occupations are usually of the bizarre, and their ideas and imaginations of the beyond. Even ordinarily, on closer observation more and more people previously classed as normal are found to be defective, and this especially among the radical class. The self styled genius who must deny himself any useful occupation for fear of stulting his gift, for fear of vulgarizing his imagination, convicts himself of mental inferiority by the very inordinate conceit which he admits. Moreover, it is rather well understood that the dividing line between this sort of genius and mental disease is not very sharply drawn. Genius, precocity, and eccentricity are usually synonyms for a condition needing the benign tolerance of society, if nothing more severe. Geniuses are found in defective families, and are so often born of defective families. Genius is not incompatible with a neurosis. The genius of the radical, if really present, is a peculiar blazing up of the psychic forces in a defective line before final decline. Indeed, degeneration is often associated with a peculiar gift. It is especially pronounced within the realms of imagination and emotion. It is in this blazing hot subsoil that their peculiar artistic work and temperament has origin. In ancestral degeneracy both the actual degenerates and the radical genius types are found. Even the "savant idiot" is not unknown to the psychiatrist. The very fact that they nearly all of them pride themselves as being "individualists" points to their shut in characteristic, and so, too, their præcoid tendencies. Moreover, these radical geniuses find their whole sphere of activity locked in one endeavor. They are the least versatile of all people. It is as if all their capacities were incomplete and that the energies of all of them were thrown into one field, and in that field the energy is abnormally active, but consuming the individual with the fiery emotion usually accompanying this type.

RECENT STUDIES ON TETANUS.

Almost thirty years ago von Behring gave tetanus antitoxin to the world and from then down to the present efforts have been made to establish the value of this agent, both as a prophylactic and a curative measure, but many obstacles have stood in the way of positive evaluation. Among these the two chief have been determination of the mode of spread of the tetanus toxin in the animal body and the fact that in civil life tetanus is not a common disease among men. The former obstacle has been very largely cleared away by the epoch making

work of Meyer and Ransom which proved the spread of the toxin to the central nervous system to take place by way of the motor nerves to the cord where it then spreads from segment to segment by direct extension along the nerve paths. Although free toxin circulates in the bloodstream this does not reach the nervous centres, except through the indirect channel of the motor neurones, none passing directly from the blood to the nerve centres. The second obstacle has been overcome in part by the heavy incidence of tetanus during the present war; studies on its occurrence, its forms, and the prophylactic and curative value of antitoxin being made public almost daily. The *Lancet* for December 22d and 29th, 1917, contains a series of very valuable and interesting papers bearing on this subject.

A careful study of the investigations reported in these several communications throws some light on the problem, but still leaves us very far from any final decision on either the prophylactic or the curative value of antitoxin, or the relative merits of the different modes by which it can be administered. The facts which may be gleaned from these studies are, however, of great significance and deserve review. In the first place a study of comparative statistics shows conclusively that the mortality from tetanus has been greatly reduced—as compared with that of prewar days; further, that even during the three years of this war the mortality has undergone a steady and very marked reduction. It is a difficult matter to determine the cause or causes of this reduction in mortality, but the evidence seems to point strongly to two factors, the most important being early injection of prophylactic doses of antitoxin and the repetition of such injections at frequent intervals until all danger seems to have passed. The second seems to be the earlier and much more efficient surgical treatment of wounds by which the major foci of infection are largely removed and the remaining small foci prevented from developing. With the general practice of early prophylactic use of the serum there has been a material alteration in two of the clinical aspects of the disease. The average incubation period has been greatly lengthened and the number of cases with short incubation period has been enormously reduced. Secondly, the occurrence of cases with tetanus localized to the part in which the focus of infection lies has been greatly increased. Both of these alterations are expressions of the modification of the disease by antitoxin and surgical treatment in a favorite direction, and both run parallel to the diminished mortality.

The status of the therapeutic use of the serum remains doubtful; statistics throw very little light

on the subject. Sherrington's researches on the monkey seem to indicate the value of intrathecal, bulbar injection of antitoxin, but the intrathecal use of antitoxin in human cases is not supported by improved results supervening. It is probable that this can be explained, as Ransom suggests, by the fact that antitoxin does not penetrate the nerve cells to any material extent even when thrown into the spinal fluid, and that it leaves this fluid and passes into the bloodstream with great rapidity. In spite of these facts the therapeutic use of antitoxin seems to have a place of some value since it is capable of neutralizing the toxin present in the blood and preventing its ultimate access to the central nervous structures through the nerves. Its intravenous administration for this purpose gives more rapid results, but the subcutaneous injection provides a more continuous neutralization and should also be employed. The recommendation to inject antitoxin locally into the region of the infection is probably of little value as this substance is not taken up from the tissues or the blood by the nerves. The one possible method of local injection which might be of value is direct injection into the nerve trunks supplying the infected extremity. Finally there is some evidence that the very prompt therapeutic use of antitoxin may be of some value in reducing mortality by protecting the body against the influence of the circulating toxin and in thereby keeping the tetanus restricted to a local and relatively harmless form.

These are but beginnings, but they serve to point the way to future research. It is to be hoped that the wealth of material now provided by the war will be advantageously used both for the unfortunate victims themselves and to secure the benefits which must come from our increase of definite knowledge.

A GREAT MEDICAL OPPORTUNITY

The curators of army museums, and medical historians are wisely and tremendously busy garnering all from the field of war which may ultimately be useful primarily for the student, but also for the civilian who reaps the benefit of every new item of sure knowledge added to the doctor's armamentarium. Like the bees in Samson's story, they swarm in the carcass of war, extracting sweets, historical and pathologic, and the names of Garrison, McCullough, Welch, Shufeldt, and the other high lights who are compiling a medical and surgical history of the war and intend getting a new building to store the harvest of pathological specimens, arms, trophies and curios, give absolute assurance that they will sustain their own reputation and ensure ours as farsighted and wise individuals.

The public are becoming more and more roused to the value of a history of the war which will embody also all that makes for the better estate of the wounded on the battlefield of strife, and the battlefield of life, those whom Maeterlinck once termed the "struggleforlifers."

In the departments of hygiene, surgery, medicine, psychiatry, not to mention such special departments as those in which particular forms of injury manifest themselves and are stimulating to deeper research, growth of knowledge, and more intelligent treatment, material is being handled at the moment and likewise collected in vast quantities for future research. Furthermore the nations have given generously of their best leaders and investigators in medical problems, so that as never before material is intelligently appraised and gathered for present and future investigation.

The material which is to become available in the museum is to be arranged in the form of loans, sets to be sent as practicable to the various medical colleges of the United States and Canada at all times for purposes of study. The extent of the project with the amount of material it will cover necessitates a new building and a government appropriation which will fully cover the plans proposed and bring them to fulfillment.

This should be a matter of interest to every patriot, to every one interested in the advance of this most practical science, and a more efficient interest and control of the factors of bodily and mental health and efficiency. It is particularly the responsibility of medical colleges and all such organizations in these two countries. Indeed the aim is to make this museum a great world centre of medical teaching and research.

THE ARMY NURSE CORPS.

The Senate Committee on Military Affairs has reported favorably on a bill providing for the reorganization of the Army Nurse Corps, details of which are given in another column under the heading of "Medical News from Washington." The bill is an admirable one in many respects. It provides for adequate supervisory officials, and increases the pay of nurses, also establishes a graded rating which will encourage the better class of nurses to devote themselves to army work.

The only criticism which can be offered to the measure is that it does not seem to provide for the utilization of the services of that large and potentially valuable class of women who are without training, but who would gladly volunteer their services with a view to receiving training in the army. The text of the measure before us is not clear and we may be in error in assuming that none except trained nurses would be accepted in the service under it.

Some special provision should be made similar

to that which has been introduced so successfully in the British army for the utilization of volunteer aides. These are now accepted in the British service in the proportion of two aides to each trained nurse. They increase the efficiency of the trained nurse under whom they serve by relieving her of many details. They should not be called upon to do that excessive proportion of purely menial labor which is exacted of nurses in training by many hospitals ostensibly as a part of the training, but in reality with a view to saving wages at the expense of the nurse in training.

The best place to train an army nurse is in the army. But we cannot afford to wait for a full two years' training. It is to be hoped that the bill will be amended so as to provide for the acceptances of nurses in training whether volunteers or not, so that the corps of nurses may be expanded to meet the enormous demand which will be made on it by the war. We already have a shortage of trained nurses in our civil hospitals which will become more marked as the war proceeds. Some provision must be made not only to supply the needs of the civilian population, but to supply the additional needs of the army. And this can best be done so far as the army is concerned by providing for nurses who will receive their training in the best possible school, the large army hospital.

The curriculum in both the army and the civilian training schools must be arranged with great care so as to avoid on one hand the multiplication of purely theoretical studies, and, on the other, the imposition of unnecessary drudgery under the guise of training, which it really is not, helpful to the highest development of the training of the nurse. A wise word of warning against excessive theoretical training is sounded by Charlotte A. Aikens in *The Trained Nurse* for April, who urges the schools to "apply the pruning knife to the things which are causing waste of time and energy with no resulting benefit to nurses, patients, or hospital."

News Items.

Personal.—Dr. S. S. Goldwater has resigned as chairman of the Mayor's Committee on Hospital and Medical Facilities but will remain a member of the committee.

Two City Hospitals to Be Turned Over to the Government.—It is reported that the Federal Government will take over Sea View Hospital on Staten Island and the Otisville Sanatorium, Otisville, N. Y., and as necessity arises, other hospitals will be turned over to the government. Extensive improvements will be made in both institutions.

Special Medical Board Appointed.—Colonel George E. Bushnell, Medical Corps, retired; Major Lewis A. Conner, Medical Reserve Corps, and Major Raymond P. Sullivan, Medical Reserve Corps, constitute a board recently appointed to meet in Washington, D. C., at the call of the senior member of the board, for the purpose of examining such officers of the Army as may be ordered before it.

Meetings of Medical Societies to Be Held in Philadelphia during the Coming Week.—Tuesday, April 30th, Medico-Legal Society, Northern Medical Association; Wednesday, May 1st, College of Physicians, Laryngological Society; Thursday, May 2d, Academy of Surgery, Obstetrical Society; Friday, May 3d, Kensington Branch of the County Medical Society, Physicians' Motor Club (directors).

New York Physician Awarded French War Cross.—

Dr. George F. Patton, 2083 Washington Avenue, New York, First Lieutenant, Medical Reserve Corps, U. S. Army, on active duty in France, has been awarded the French War Cross for conspicuous courage in treating wounded men while unable to wear his gas mask, during a heavy fusillade of gas shells. He continued to treat wounds until overcome.

Volunteer Hospital to Be Enlarged.—

The directors of this hospital, which is situated at Beckman and Water streets, New York, have decided to begin work this summer on an addition of three or more stories to the building and a solarium, where the necessary funds have not yet been collected. The demands upon the hospital have increased since Hudson Street Hospital is caring for sailors and its ambulances have been withdrawn from general work.

The National Tuberculosis Association.—

The National Association for the Study and Prevention of Tuberculosis has been newly incorporated under the name of the National Tuberculosis Association, and beginning May 1st the new address of the association will be 381 Fourth Avenue, New York. The fourteenth annual meeting of the organization will be held in Boston on June 6th, 7th, and 8th, under the presidency of Dr. Charles L. Minor, of Asheville, N. C., with headquarters at the Copley-Plaza Hotel, where all meetings will be held unless otherwise announced. Dr. Charles J. Hatfield is executive secretary of the association, and will be glad to furnish further information regarding the meeting.

Meetings of Medical Societies to Be Held in New York during the Coming Week.—

Wednesday, May 1st, Brooklyn Society of Neurology, Society of Alumni of Bellevue Hospital, Harlem Medical Association (annual), Bronx Medical Association; Thursday, May 2d, New York Academy of Medicine (stated meeting), Brooklyn Surgical Society, Physicians' Economic Society of New York; Friday, May 3d, New York Academy of Medicine (Section in Surgery), New Utrecht Medical Society, New York Microscopical Society, Brooklyn Gynecological Society, Practitioners' Society of New York (annual), Alumni Association of Roosevelt Hospital (annual); Saturday, May 4th, Benjamin Rush Medical Society, New York.

The Nomenclature of War Diseases and Injuries.—

A conference was held on Monday, April 22d, in the office of Dr. Franklin H. Martin, chairman of the General Medical Board of the Council on National Defense, for the purpose of considering the advisability of adopting a uniform nomenclature for diseases and injuries resulting from the war. It is said that a good deal of confusion has arisen as a result of different terms being used in various medical groups. Among those who attended the conference were Colonel Albert G. Love and Colonel C. C. McCulloch, Jr., representing the Army; Assistant Surgeon Charles E. Alexander, of the Bureau of Medicine and Surgery; Dr. B. S. Warren, of the United States Public Health Service; Dr. W. H. Davis, of the Census Bureau; Dr. W. T. Longcore, of Columbia University, Medical Department; Dr. John W. Trask, of the American Medical Association's Committee on Nomenclature, and Dr. Robert L. Dickinson, of the Medical Section of the Council on National Defense.

The Health Department Investigation.—

The Civil Service Commission of the city of New York, which has been investigating the Health Department for the past ten days, submitted a preliminary report to the mayor on April 26th. This report sums up its findings as to alleged graft in the Health Department as follows: "We have found a smooth running systematic graft agency, and there is every indication that it has been operating with impunity in the Health Department for many years." The report declares that the bureau of the department lack coordination and that "each is constantly reaching out for new functions and added powers. There is a tremendous duplication of work." The commission recommends that the Bureau of Public Health Education be abolished. This bureau is termed "the press agent of the Health Department." Succeeding hearings of the commission will be open to the public. At the two public hearings which have been held thus far the opposition on the part of the medical societies of the city and county and other health and civic organizations to the abolition of the Bureau of Public Health Education has been unanimous. The charges of graft made by the investigating body have been turned over to the District Attorney for thorough investigation.

Physicians Wanted at Rome Asylum.—The superintendent of the Rome State Custodial Asylum, Rome, N. Y., announces that physicians are wanted to serve as assistant physicians, clinical assistants, and medical interns in the institution. For information concerning these positions address the superintendent, Dr. Charles Bernstein.

Medical Library Association Will Omnit Annual Meeting.—

Dr. William Browning, of Brooklyn, president of the Medical Library Association, announces that, owing to war conditions existing at present and the difficulties of travel incident thereto, the Medical Library Association will omit its regular meeting this year. Dr. John Ruhrah, 1211 Cathedral Street, Baltimore, is secretary-treasurer of the association.

Women Physicians in the Public Health Service.—

The United States Civil Service Commission announces an examination for acting assistant surgeon, open to women only. Vacancies in the Public Health Service, at salaries ranging from \$1,800 to \$2,500 a year, will be filled from this examination, applications for which must be filed on or before May 21, 1918. For the necessary application blanks and full information regarding the scope of the examination address the Civil Service Commission, Washington, D. C.

Resolutions on the Death of Dr. Ramon Guiteras.—

At a recent meeting of the Harvard Medical Society the following resolutions were adopted:

Whereas Dr. Ramon Guiteras, of the Harvard Medical School, died on April 26, 1918, for the loss of one whose personal charm and lovable quality, associated with eminent professional attainments, made a combination the worth of which is universally acknowledged; and be it further resolved that the Harvard Medical Society express its sincere sympathy to the family of Dr. Guiteras, together with the society's deepest sympathy.

More Than Half Beth Israel Hospital Staff in the Army.—

At the twenty-eighth annual meeting of the Beth Israel Hospital Association, held recently, announcement was made that more than half of the medical and surgical staff of the hospital had volunteered for military service, and that the hospital laboratories and its other facilities were being used in part by the government. Among the Beth Israel physicians who are now on active service are: Dr. S. J. Kopetzky, lieutenant colonel; Dr. Charles Goodman, major, in charge of a unit; Dr. L. B. Meyer, captain, in charge of Base Hospital No. 3, all in France; Dr. L. J. Ladinsky, captain, at Camp Merritt; Dr. S. W. Schapira, captain; Dr. E. Altman, captain; Dr. I. Seiff, lieutenant, and Dr. Charles Gottlieb, lieutenant.

A New American Hospital in London.—

On March 26th American Red Cross Hospital No. 24 was opened in Kensington Palace Gardens, London. This is the fifth hospital established in Great Britain by the American Red Cross and is the gift of Mr. and Mrs. A. Chester Beatty, of New York. The hospital is auxiliary to the Military Orthopedic Hospital at Shepherd's Bush, and for the present will accommodate British and Dominion officers until it is needed for Americans. The medical and nursing staffs are entirely American. There are eight wards and accommodation for thirty-six orthopedic cases. The wards bear the names of famous Americans—George Washington, Stonewall Jackson, Robert E. Lee, U. S. Grant, Abraham Lincoln, Alexander Hamilton, Thomas Jefferson, and Benjamin Franklin.

Enlargement of Naval Hospitals.—

Plans have been made by the Surgeon General of the Navy for additional accommodations at the naval hospitals. Some 15,000 beds have been provided at various places, and it is proposed to increase this by 8,000 beds, together with 3,270 beds for the use of the hospital personnel. Accommodations also will be provided for the shelter of medical officers.

It is estimated that the personnel of the naval hospitals are being made to establish three naval hospitals in England, each with 1,000 beds. The matter has been delayed

Modern Treatment and Preventive Medicine

A Compendium of Therapeutics and Prophylaxis, Original and Adapted

THE TREATMENT OF HEMOPHILIA.

By LOUIS T. DE M. SAJOUS, B. S., M. D.,
Philadelphia.

(Continued from page 750.)

Administration of blood serum yields more complete results, according to Weil, 1906, in cases of sporadic or accidental hemophilia—presumably what we term purpura hemorrhagica—than in the cases of true or hereditary hemophilia. In the former cases he observed reduction of the coagulation time from protracted periods such as an hour and a quarter to five minutes, whereas in the hereditary form, clotting was merely somewhat accelerated. Lucas, 1909, similarly states that serum is of markedly less value in congenital hemophilia than in certain other conditions, such as primary purpura and hemorrhagic jaundice. He obtained successful results from serum, however, in each of two cases of congenital hemophilia, and speaks of the benefit from serum in such patients as lasting from a few days or weeks to one or two years. According to Weil the action of serum, whether in sporadic or hereditary hemophilia, lasts as a rule four or five weeks, after which additional injections are required to keep up the effect. The beginning of the favorable effect from serum treatment has been variously stated to appear in from twelve to forty-eight hours after the injection. But in a number of reported instances, hemorrhage already established ceased within a short time after the first administration of serum. Injection of serum on the day before an operative procedure in a bleeder has repeatedly yielded successful prophylactic results.

Effects of serum other than the mere replacement of substances lacking in the hemophilic blood—a species of opotherapy—have been thought to occur by various students of the bleeder problem. Weil felt it justifiable to assert that by repeated administration of serum an improvement in the fundamental pathological state underlying the disease can be secured, while others have suggested that the serum exerts a useful stimulating action on the bone marrow. Nothing very definite can, however, as yet be stated on this point. Marfan and Lemaire, by the precipitin test, found the foreign serum to be eliminated within four or five weeks after its administration—the same period as the average time during which acceleration of clotting persists after injection of serum. Trembur, 1909, observed a marked leucocytosis following serum injections, and presumed that the resulting increase in ferment bearing cells might be useful.

An important point in relation to the treatment is the advisability of using a freshly procured serum. This is not to be taken, however, to mean that normal serum loses its valuable coagulant properties within a few hours or days. Lucas, studying experimentally the reactivating power of various serums, i. e., their capacity to cause coagulation upon

addition of a small amount to blood artificially rendered incoagulable, found at least some serums as active at the end of forty days as when first drawn. After a hundred days, in one instance, the reactivating power had disappeared. In default of fresh serum, regular antitoxin serums, especially diphtheria antitoxin, have been used, often with satisfactory results, whether injected or applied locally. Nevertheless there is unanimity of opinion to the effect that fresh serum is, in general, more effectual, and an effort should be made to obtain it for use in these cases. Human serum is considered preferable by Welch, 1910, and others, to all other serums, in that it never provokes serum sickness nor allergic manifestations.

A feature of interest clearly brought out in the paper of Minot and Lee, 1916, is that hemophilic serum will clot hemophilic blood plasma equally as well, and in essentially the same time, as normal serum. Addis, 1911; Fonio, 1914, and others have shown that the serum which remains after coagulation of hemophilic blood contains a normal amount of the clotting principle, thrombin, and that the latter behaves in an entirely normal manner. This is in accord with the conclusion reached by Minot and Lee from their study of the blood platelets in hemophilia, viz., that there exists in this disease a defect of the platelets whereby they are only slowly, instead of promptly, available for the purposes of coagulation. Delay thus arises in the initial stage of coagulation, but once the platelets have become available—a gradual process in hemophilia—coagulation proceeds in an essentially normal fashion, and the resulting serum possesses properties very similar to those of normal serum. The platelets in hemophilia are approximately normal in number, and under certain favorable circumstances established artificially by Minot and Lee in their laboratory studies were found to behave almost normally. In view of these facts the possibility suggests itself that a hemophilic patient's own serum might on occasion prove of therapeutic service. The blood, could, in some cases at least, be allowed to drop unsullied into a sterile receptacle, clotting awaited, and the serum obtained reinjected subcutaneously. The delay before clotting would be a disadvantage, but the difficulty of obtaining serum from other individuals, as well as the possibility of unpleasant reactions from animal serums, would be disposed of, and the patient might be for a time, protected against recurrence of hemorrhage.

Serum treatment is also available and of considerable value in the so-called hemophilia or melena neonatorum, which is believed usually due to infection. Welch, 1910, emphasized the fact that normal human serum, injected subcutaneously, is readily absorbed from the point of injection, often disappears within five minutes upon gentle massage of the overlying skin during the infection.

(To be continued.)

Ear Protection at the Front.—STACY R. GUILD (*Journal of Laboratory and Clinical Medicine*, September, 1917, and January, 1918) says the matter of ear protection apparently turns on some very simple devices, yet these are only with difficulty to be found and adjusted with the accuracy necessary in so important a feature of military protection.

This is the first war in which such devices have been needed or used to any great extent. There have already been 100,000 cases or more of war deafness, as against a few hundred at the most in previous conflicts. There are etiologically two forms of ear injury, one due to continual noise and gradual in development, the other caused by a single detonation in which the injuries are due to high air pressure and are therefore preventable without interfering with the entrance of sound waves. The effects of the high air pressure are rupture of the tympanic membrane, organic disturbance of the labyrinth or functional disorder probably of the central nervous system. Danger of infection must also be guarded against. This would be present in the first of these varieties of injury and would also exist with a form of injury where an improper protective device might, being splintered, act as a secondary projectile. With the danger of infection and the slow healing of these ear injuries, to say nothing of loss of time and increase of hospital burdens, it is plain that prevention is unmistakably a part of that prudence which makes up a large part of valor, certainly in these times of detailed efficiency.

The tests upon the various devices sent to the author are reported by him in an interesting discussion of the method by which these devices were applied to the animals utilized, and of the results observed in the middle ear parts. But since the preparation of the cochlea for examination takes a much longer time, the reports of cochlear injury are deferred to a later date.

The present report chiefly concerns the devices themselves and their relative advantages. Dry cotton plugs, though placed firmly in the ear, have already proved ineffectual in both army and navy, and this was merely confirmed by experiment with animals. They admit of passage of air, as the cotton is really in itself air-containing. The Elliott "Perfect Ear Protector" and the Wilson-Michelson device also did not prevent positive injuries in the animals tested. The former of these has the form of a double diaphragm with a tube passing through, and a narrow air passage within the tube with openings between the spaced diaphragms and at the inner end. The latter is of the nature of a hard obturator, which involves danger of secondary projectile injury, being a frame of hard rubber with a valve of metal adjusted to detonation waves, while a gauze mesh, placed in a detachable metal cup, protects the outer end but would not prevent dirt and other particles from entering. Besides the inner end apparently has to be made to fit each individual ear, which would make it impracticable and too expensive for military use. The Mallock-Armstrong "Ear Defender" gave satisfactory results. This consists of a cylinder in which is a diaphragm with gauzes spaced on either side. The diaphragm with its gauzes in the newer model are membranous instead of metal, but the wearer still

is menaced by the danger of secondary injury from the obturator, to which this type of device belongs. Besides, the gauzes and membrane would become clogged with dirt and mud. The "Scientific Ear Drum Protector Tommy" patented in Great Britain and France gives good results, but does not admit quite so well the passage of sound waves as the one just mentioned. Furthermore, the soft rubber spherical bulb of which it chiefly consists, with an opening on one side covered by a flange, might cause irritation by its continual pressure. The "Tommy" is most easily kept clean and on the whole recommends itself as the best of the mechanical devices for army use.

The Italian Navy use a wax cone which is very effective, and close to it comes the plug of vaseline soaked cotton. This has the great advantage of the availability of both these substances of which it is composed. Glycerine upon cotton does not afford so good protection. Theoretically water soaked cotton should prove equally serviceable, but it was not put to the test in these experiments. The tests for the relative reduction of the passage of sound, so important in military service, have not as yet been satisfactory. The author can only speak in a general way in regard to this. All, he affirms, permit conversational sounds to pass readily, as well as commands and signal whistles from a considerable distance, and all of the mechanical devices are better in this respect than the wax or soaked cotton plugs.

War Wounds of the Knee Joint.—J. R. Judd (*Surgery, Gynecology, and Obstetrics*, January 1918) summarizes with regard to war wounds of the knee joint as follows:

Wounds of the knee joint in modern warfare maintain the same importance and gravity that have existed since the birth of surgery. The resisting powers of the synovia and ankylosing tendencies vary in individuals. In the presence of an infected projectile and infected joint fluid, the synovia may be still uninfected for a certain period. Fissures extending to the articular surface are important and often unrecognized. Secondary infection of the ankle joint sometimes occurs unexpectedly and is a grave complication. The earlier methods of non-interference drainage tubes, and wholesale removal of bone have yielded disastrous results. The mortality has been greatly reduced by improved methods of treatment. Perforating wounds traversing the joint should be treated by puncture, compression, and immobilization. For wounds with foreign bodies included, with or without bony lesions, early intervention is the secret of success. The new era in knee joint surgery calls for arthrotomy within forty-eight hours, removal of projectile, foreign bodies and loose fragments, excision of path of projectile, cleansing of joint, and suture without drainage. Extensive bony lesions demand primary resection. It is in the decision as to what cases should properly be treated by the new era method and what cases demand resection on account of the extent of the bony injury that difference of opinion between individual surgeons is bound to exist. From all points of view, vital preservation of the limb and its function and duration of hospital stay, the results of the improved method are vastly superior.

Treatment of War Wounds.—Frederic A. Belsey (*Surgery, Gynecology and Obstetrics*, January, 1918) says in part that we are now confronted with the problem of applying measures to close these wounds by secondary suture, for the purpose of shortening convalescence. He believes that it is in this relationship that the Carrel-Dakin solution probably plays a most important role, for he thinks we must admit that if the solution is properly applied with great attention to detail, we can secure a granulating surface that is free from bacterial infection. The bacteria which have existed in the deeper lymphatic spaces are destroyed by natural agents or eliminated to the surface by exuding serum. As soon as smears and cultures show an aseptic surface, many of these wounds can be sutured and a given proportion of them will heal by first intention. If one is not contemplating the secondary suture of such large wounds, he doubts if any antiseptic solution materially hastens the granulating process.

Further Observations on the Results of Blood Transfusion in War Surgery.—L. Bruce Robertson (*Annals of Surgery*, January, 1918) concludes, regarding blood transfusion in war surgery, that: Many cases admitted in an inoperable condition from severe hemorrhage have been rendered operable by blood transfusion; the largest factor in causation of shocked condition as seen in patients admitted to a casualty clearing station appears to be a loss of blood, except in case of visceral injury; in two cases hemolysis hastened the death of the patient, in one of these the citrate method was used. The possibility of hemolysis certainly is present, but the danger of its occurrence is slight in comparison with the danger of operating on a shocked and exsanguinated patient. The results in a series of cases tabulated by Robertson may be classified as: Life saving, 22; immediately beneficial but died from infection at operation, 9; no benefit, 3; harmful, 2; total, 36. Although the mortality in the series of cases was comparatively high, it must be remembered that all patients were in a desperate condition, and with perhaps one possible exception could not have been expected to survive if the procedure had been withheld.

Intraocular Foreign Bodies in War Wounds.—F. de Lapersonne (*Bulletin de l'Académie de médecine*, February 12, 1918), among 1,000 eye cases in soldiers, noted 193 of penetrating wounds of the eye by small metallic fragments. Usually the latter were fragments of shells or grenades, occasionally bits of nickel or copper, rarely bits of glass, wood, stone, etc. Among the immediate complications in such cases, traumatic plastic iridocyclitis has, in the present war, proven the most dangerous, sympathetic ophthalmia occurring much less frequently than in previous wars. Among the late consequences of embedded iron fragments special stress is to be laid on siderosis, due to oxidation of the iron and migration of the oxide in the tissues of the eye. This condition is always accompanied by iridocyclitis, with softening of the globe, a tendency to atrophy, and sometimes even sympathetic ophthalmia as a terminal result. Too often unilateral or even bilateral blindness follows these complications, whether early or late. The author urges the adop-

tion of visors, glasses, or masks especially for the protection of the eyes of soldiers against small foreign fragments. Clinical means of early diagnosis are practically nil, the point of entrance of the foreign body being as a rule hardly visible. Yet early removal is essential if the serious complications mentioned are to be forestalled. A special ophthalmologic service should therefore be established in connection with each army, to which the men wounded in the eye or orbit can be rapidly transported. The service should be independent of the surgical automobiles and should possess a special x ray outfit and electromagnets. Fluoroscopy having proven insufficient for the detection of minute foreign particles, the outfit available should be such as to permit of careful localization by means of multiple x ray plates.

Military Surgery in the 23d General Hospital, B. E. F., France.—James M. Neff and John G. O'Malley (*Surgery, Gynecology, and Obstetrics*, January, 1918) say that in the first place, all antiseptic irrigations affect only the pathogenic organisms on the surface of the wound with which they come into contact. It makes no difference whether there be one or one hundred tubes inserted in an infected area, it still resolves itself into a partial disinfection of the surfaces which are in contact with the tubes. In other words, all solutions are absolutely powerless to affect pathogenic organisms which are present beneath the surface, and it is these organisms that are doing the damage. All microorganisms on the surface of an infected wound are harmless and are of no consequence, for the simple reason that they have been thrown out of the tissues by the exuding serum. To kill and wash these away obviously does no good. The reason why we are unable to penetrate tissue with antiseptic solution is perfectly plain. Within the tissues there is always a plus pressure in both the blood and lymphatic vessels in relation to the surface of the wound. This means that the flow of serum is always outward toward the surface, which makes it as impossible for any solution to enter it as it is for water to run up hill. To be sure, certain chemicals are absorbed, but they are absorbed by the superficial lymphatic vessels only, and do not enter the intervascular space. These few simple and obvious facts explain the failure of all irrigations.

Shock in the Wounded and Its Treatment.—Gatellier (*Presse médicale*, January 17, 1918), after experience with 6,667 wound cases in a divisional ambulance, divides the cases of shock into three major groups, viz., nervous, hemorrhagic, and intoxication. A group apart is that of shock by exposure or exhaustion. Among 112 cases of hemorrhagic shock, he operated on all—103 in number—who did not die within a few minutes after admission. Ninety-six recovered and but seven died—an observation tending to prove the advisability of immediate operative hemostasis in hemorrhage cases, whether shock is or is not simultaneously present. The 103 ligations included eight of the external carotid, five of the axillary, sixteen of the brachial, thirteen of the femoral, eleven of the posterior tibial vessels, one of the plantar vessels, etc. Under nervous shock are placed concussion, multiple

wounds, or extensive contusions. In these cases the system has reached the extreme limit of its resisting powers. Unfortunately the treatment is often disappointing. In spite of the inverted posture, external heat, light baths, saline solution, adrenalin, camphorated oil, rubbing, and strychnine, the shock persists and the subject succumbs in a few hours, sometimes after a period of apparent general improvement. In four of the author's cases of grave nervous shock, however, expectant treatment and postponement of operation were followed by recovery. Toxic shock results from absorption of poisonous materials formed in badly damaged soft tissues. An opportunity for recovery is afforded only by prompt excision of the toxic focus or by amputation. Of thirteen cases thus treated, all recovered.

Postoperative Pneumonitis.—Allen O. Whipple (*Surgery, Gynecology, and Obstetrics*, January, 1918), concludes with regard to postoperative pneumonitis as follows: It is a far more frequent complication than reported. Its incidence in surgical services varies largely with the care given to its detection. The most important predisposing factors are: Recent or concurrent inflammation of some part of the upper respiratory tract; pulmonary congestion; inhibition of normal respiratory movements or excursion as a result of abdominal incision; debilitated states, such as sepsis and cachexia; increase of the numbers and virulence of the pneumococcus during the winter and early spring. The most common inciting factor is the pneumococcus. Of the groups, the pneumococcus IV is the most frequently found in the patient's sputum. The pneumonitis, caused by pneumococcus IV is, as a rule, an atypical pneumonia, of short duration, resolving by lysis, and has a lower mortality than the groups I, II, and III pneumonias or the pyogenic or septic pneumonias.

Solution of Soap and Water in Gunshot Wounds.—J. B. Haycraft (*British Medical Journal*, January 19, 1918) reports strikingly good results from the use of a soap solution, combined with primary suture in gunshot wounds. There were only seven complete failures in a series of ninety-eight cases, and only two failures among thirty-eight cases of compound fracture. The solution used was made by dissolving one part of shaved, pure hard soap in twenty of boiled water. When applied this was diluted with an equal volume of sterile water. Where possible the entire wound surface was excised, the soap solution applied and rubbed in thoroughly, and the wound closed by immediate suture. In deep wounds or perforating ones complete excision was not always possible, but the soap solution was applied as described after the wound had been well cleaned up, a split rubber drain inserted, and the wound closed. This was also the technic in cases with compound fracture. If necessary, tension incisions were made near the wounds to permit closure. In many cases healing was prompt, with little or no local reaction, but in others there was some local redness, swelling and edema after two or three days, but so long as there was no rise in the patient's pulse rate this was found to subside promptly. In all cases the wounded part was completely immobilized for a week to ten days. The method was found suitable for fresh cases only.

The Acute Nephritis of War.—Angelo Ceconi (*Riforma Medica*, January 26, 1918) reviews all the theories which have been advanced as to the etiology of this condition such as vaccinations, substances used against pediculi, lead poisoning from cooking utensils, avitaminosis, etc. A wide experience leads Ceconi to believe that the process is an infectious one and that lice and other vermin are frequently the means of transmission of the infection, bearing in mind, however, the etiologic importance of exposure to cold, tonsillitis, and acute articular rheumatism.

Treatment of Pyelitis.—Samuel S. Rosenfeld (*Medical Record*, March 16, 1918) states that all observers agree as to the value of flushing the kidneys by the drinking of large quantities of water and the administration of urotropin. As Burnam, Jenner, and Smith have shown, five to ten grain doses of urotropin produce free formaldehyde in the urine in only twenty per cent. of cases, while doses of twenty to thirty grains will do so in sixty per cent. of cases. Other treatments are the alkaline (usually with citrate of potassium) and that by santal oil, which has been found to have a rather specific action on the staphylococci. Pilcher's postural method with elevation of the head and trunk gives much better drainage of the kidney pelvis. Lavage of the pelves of the kidneys followed by the injection of fifty per cent. argyrol or one half to one per cent. silver nitrate is advised by some workers, including Pilcher. However, medical treatment suffices in the vast majority of acute cases, and in the chronic cases the local and vaccine treatment are being more and more used.

The Use of Dichloramine-T in the Treatment of Infections and Infected Wounds.—Walter E. Lee and P. Funiess (*Annals of Surgery*, January, 1918) say that particular attention must be paid to the following points in handling Dichloramine-T and its solutions: All bottles should be of dark amber, glass stoppered. They should be thoroughly cleaned and dried before any of the materials are put in. If alcohol is used for drying the bottles, it should be allowed to completely evaporate before the bottles are used; no solutions should be returned to the stock bottles from the ward bottles or atomizers at any time; bottles in which the solution has already undergone decomposition should be carefully cleaned with hot water and dried thoroughly. If, in using the twenty per cent. solution, medicine droppers or glass rods are used to transfer the oil to the wound surfaces the droppers should be dry if put into the oil bottles. The common practice in some places has been to boil these utensils to sterilize and then use them while still wet. This results in the gradual accumulation of water in the stock bottles and a very rapid decomposition of the Dichloramine-T. The glass rods or pipettes or syringes if left in contact with the oil for five or ten minutes are entirely sterilized and do not need boiling. The method Lee and Funiess have followed is to pour the required amount for the wound into a clean dry medicine glass and to take the oil with the pipette from the second container. They have repeatedly kept the twenty per cent. solution on the laboratory desk in brown bottles for three to four weeks before it decomposed.

Miscellany from Home and Foreign Journals

Relation of Pellagra to Location of Domicile. Siler, Garrison, and MacNeal (*Archives of Internal Medicine*, August, 1917) report very thoroughly investigations conducted in Spartan Mills, a cotton mill community situated in the northwestern part of the city of Spartanburg, S. C. Pellagra has long been endemic in this community. It was found that since 1914—complete data for the following period having been obtained—nearly all newly incident cases of pellagra had developed while the persons were residing in the same house with or next door to a pellagrin in the active stage of the disease, or within six months after the termination of such exposure. After the installation of a sewer system the spread of pellagra in the community was decidedly restricted. In 1916 the only considerable focus of new cases occurred in the immediate neighborhood of a dilapidated outhouse privy used by pellagrins. The studies are held to support the previous conclusion of the authors that pellagra is an infectious disease, which spreads slowly, attacking only a small proportion of the population in the immediate vicinity, and the extension of which is especially favored by insanitary methods for the disposal of human wastes.

High Blood Pressure in Heart Patients With-out Valvular Disease.—P. Merklen (*Paris médicale*, February 9, 1918) lays stress on the remarkable frequency of such cases under war conditions. They are met with far oftener than valvular disorders, and often are less well borne than the latter, a mitral or aortic patient feeling no precordial discomfort where one of these high pressure cases would be seeking relief. Patients with cardiac erethism, tachycardia, and palpitations often show the high blood pressure, which, however, does not necessarily correspond in its intensity to the other symptoms present. At times the high pressure persists during rest, when tachycardia, pain, and dyspnea are wanting. Other symptoms include a feeling of constriction in the chest, rather constant fatigue, weakness, dizziness, fainting spells, insomnia, loss of weight, and pains in the lower extremities. The myocardial contraction is vigorous: the heart rate may increase upon the slightest movement; a pulsation at the base of the neck may be noted, and there may be an accentuated second aortic sound, extracardiac murmurs, arrhythmia, pallor or deep redness of the face, and acrocyanosis of the extremities, nose, and ears, which are reddened, yet cold. As a rule there is no cardiac hypertrophy or change in the aorta. The etiology of the condition is indefinite. Age, exertions, and toxic influences do not seem to be factors, or act only as secondary, aggravating circumstances. The underlying state seems to be a disturbance of the nervous system awakened by mental or traumatic shock. Gallavardin has termed a similar group of cases, the tachycardic neuroses, and ascribes them to intense excitation of the sympathetic system, probably of thyroid origin. Merklen would term the group of cases he describes the hypertensive neurosis. Hyperplasia of the adrenals may be a

cause of the high blood pressure, without necessarily casting aside a preponderating role on the part of the nervous system. Some of the cases show no disturbance of cardiac function. Where palpitation or erethism exist, improvement may occur upon prolonged rest. Among soldiers the rule should be not to impose upon these patients duties which will overtax their working capacity. Systematic, slow training will in some instances overcome the difficulty. Alcohol, tobacco, and other toxics should be interdicted, a diet low in meats ordered, and nerve sedatives administered. In certain cases heart tonics may be useful.

Eczema, Urticaria, and Angioneurotic Edema.—I. Chandler Walker (*Journal A. M. A.*, March 30, 1918) calls attention to the fact that these affections have been shown to result from sensitization to various food proteins in many cases and presents the protocols of the case records of twelve patients in whom one or another of these conditions resulted from sensitization to proteins other than those found in foods. The offending proteins included those of horse dandruff, of the pollens of timothy and ragweed, and the protein of flaxseed. In the cases of eczema the patients were found to tolerate only very small doses of the offending protein and to improve under their use, while the administration of only slightly larger doses promptly aggravated their eczema. Where eczema and asthma were associated the amount of protein which benefited the eczema was too small to have any influence upon the asthma, while enough to affect the latter aggravated the former.

Wolff's Law of Bone Transformation.—Arthur Keith (*Lancet*, February 16, 1918) discusses this law in the light of more recent knowledge and points out that the important factor in bone development and transformation is the behavior of the osteoblasts. An understanding of their behavior should prove of vast importance to orthopedic surgeons, for these cells can be made to serve the needs of any case almost at will. The influence of stress is essential to their activity and the lines along which they will build new bone and remove old are determined almost wholly by the stresses which act upon them. This is shown by a study of bone grafts, curvatures of bone, and by the fact that beating the femoral condyle will lead to the formation of a wall of new bone which will prevent the dislocation of the patella. All injury to bone stimulates their activity and the diaphyseal cartilages act as normal buffers to limit the radiation of such stimuli. Their activity is increased by acute inflammation, but their sensitiveness to pressures is diminished. Other qualities are shown by the study of diseased conditions, such as their extreme stimulation by pituitary substances in giants, their lack of growth in dwarfs through the failure of a pituitary stimulus, their increased growth in cartilage covered parts of bone in acromegaly under the combined influences of pituitary and the stress of activity and function of the parts, and their loss of sensitiveness to stress in Paget's disease.

Acute Nephritis.—E. H. Mason (*Archives of Internal Medicine*, February, 1918) ascertained, from careful serial studies of the renal function in three cases, that in very severe instances of acute nephritis the renal function during the early stages is much better than the actual state of the kidneys would seem to show. This he ascribes to the stimulation to which the kidneys are subjected at the outset of the disease. With the subsidence of the inflammation, however, the renal function tends to fall to a very low level, which is more truly an index of the condition of these organs. Thus in one of his cases an extreme and prolonged impairment in the rate of urea excretion first appeared at a time when the patient was beginning to show marked general improvement. Simultaneously the rate of phenolsulphonethalein was impaired, but the blood plasma chloride and the chloride threshold returned practically to normal. This period in which, as the inflammation subsides, the renal stimulation is removed, is the critical period in acute nephritis; during the resulting prolonged rest of the kidneys great care must be taken not to overstrain the exhausted function. As convalescence is established the level of renal function tends, after the temporary "slump," to return to that up to which the kidneys are still able to functionate in spite of their permanent damage. Observations of the effects of theophyllin in renal cases suggested that this drug acts in part by lowering the chloride threshold. The chlorides are thereby allowed to pass out of the blood plasma, and water follows.

Nature of the Virus of Rabies.—P. Remlinger (*Bulletin de l'Académie de médecine*, February 12, 1918) lays stress on certain peculiar properties of this virus which would seem to place it in a class intermediate between microorganisms and simple chemical substances. One distinctive feature is its property of diffusing through certain fluids, such as normal saline solution, Locke's solution, and glycerin. While glycerin preserves both the virus of rabies and those of anthrax and tuberculosis, the last two do not have this singular property of diffusing through the glycerin. The virus of rabies will even pass into a spleen, lung, or brain immersed in the glycerin containing it. If a bit of one of these organs from a healthy animal immersed in glycerin in which a brain from a rabid animal has also been placed is made into an emulsion and injected subcutaneously in a rabbit, guineapig, or even a hen or turtle, rabies will often follow. The diffusibility of the virus separates it from protozoa or bacteria and renders it similar to simple chemical compounds capable of dissolving in and diffusing through liquids. The rabies virus also diverges from the visible microorganisms in passing through fine filters, though when the interstices in the filter reach a definite limit of fineness, the virus will no longer pass, thus diverging from simple chemicals, which when in solution will pass through any filter. If a somewhat coarser filter is used, animals inoculated will succumb with all the symptoms of rabies but without the power to transmit the disease to other animals. Slightly finer filters may lead to symptoms only distantly related to rabies, such as loss of weight and cachexia—symptoms which A

Marie has shown can be produced by simple filtrates from normal nervous tissue. On centrifugation, rabie virus shows a very slight degree of displacement, far less than the smallest visible microbe. Chemical substances in solution, however, are entirely uninfluenced by centrifugation. Being thus simultaneously diffusible, filterable, and capable of selfreproduction, the virus of rabies must be considered as constituting a transitional stage between the lowest forms of the vegetable kingdom, viz., the bacteria, and what may perhaps be referred to as the highest forms of unorganized bodies, viz., the diastases, which belong to the group of the colloidal substances.

The Relation of Lupus Erythematosus Discoides to Tuberculous Infection.—Richard S. Weiss and J. J. Singer (*American Journal of the Medical Sciences*, April, 1918) report a study of twelve cases and state that in their opinion no evidence has been presented as yet that shows a relation between lupus erythematosus discoides and tuberculous infection or tuberculous disease. The fact that tuberculosis, past or present, may be demonstrated in practically all cases of this disease should be interpreted as further evidence of the ubiquity of tuberculous infection, and not as evidence of an etiological relationship.

Palpation of the Cecum.—L. Pron (*Bulletin de l'Académie de médecine*, February 5, 1918) warns against diagnosing appendicitis where merely a cecalgia exists; the latter is a very common condition in patients with affections of the alimentary tract. To palpate the cecum, the radial border of the right hand in forced pronation, with the fingers directed toward the pubes, is used to exert deep pressure in the right iliac fossa. In doing so, to and fro movements from the inner margin of the cecum outward are executed, the thumb resting for support against the outer portion of the iliac crest. Repetition of the procedure at different levels permits of ascertaining the situation, margins, shape, and consistency of the cecum. Among 123 patients the cecum was palpable in fifty-four and tender in forty. Among the remaining sixty-nine, twenty-two complained of marked pain, radiating toward the sigmoid or epigastrium, upon pressure over the cecum. The cecum was thus abnormal in seventy-six cases, or sixty-three per cent.; according to Glénard the normal cecum is neither tender nor definitely palpable. In forty-six of the fifty-four instances of palpable cecum the to and fro movements of the palpating hand evoked distinct gurgling or splashing sounds. Among thirty-one patients with gurgling fourteen were chronically constipated and fifteen had irregular bowel movements. Where a cecum is not at first palpable it will often become so in a few seconds through reflex contraction. A relationship seems to exist between cecal tenderness and such liver affections as hepatoptosis, hepatic enlargement, gallbladder pain in the absence of actual attacks of colic, cirrhosis, etc. Of fifty patients with definite hepatic disease, thirty-two had a palpable or tender cecum. Of 108 patients with gastric disorders causing objective signs, seventy-two had an abnormal cecum.

War Tremor.—Meige and Bénisty (*Presse médicale*, February 4, 1918) point out clinical features which permit of differentiating tremors of organic origin among soldiers from tremors of neuropathic or emotional origin. In the organic cases special value attaches to morphologic and physiologic features of the type of those present in paralysis agitans. The latter disorder followed traumatism in one of their cases. Likewise to be differentiated are clonic movements sometimes mistaken for true tremor and due to certain lesions in the region of the peduncles and pons. The site and form of the tremor are both of import in the clinical diagnosis. Fine, rhythmic tremor of the fingers nearly always indicates organic involvement. Neuropathic tremor is frequently localized in the flexors and extensors of the wrist or in the pronators and supinators, without participation of the fingers. The sensation felt upon passive motion of limb segments is an essential feature in the examination. The waxy flexibility of Parkinson's disease is clearly distinguishable from the cogwheel resistance noted in most neuropathic tremors. The course of the condition of tremor may also be of diagnostic utility. The Parkinsonian tremor belongs to the group of the progressive tremors, localized at first in one limb or segment of a limb, then progressively involving one or more other limbs. Retrogressive tremors, generalized at first but then tending gradually to become restricted in one limb or limb segment, are chiefly suggestive of a neuropathic origin. There is also a third group, that of the migratory tremors. The tremor may spontaneously become displaced from one location to another. Such tremors are rendered more apparent by changing the positions of the limbs or by immobilizing one or more limb segments. Parkinsonian and paratonic cases may show along with the tremor a permanent muscular hypertonicity.

A Study of the Healing of Wounds.—Tuffier and Desmarres (*Presse médicale*, January 31, 1918) state that at the Rockefeller Institute at Compiègne, France, a careful investigation of the processes of repair of superficial sterilized wounds, i. e., wounds yielding but one or two cocci per microscopic field, has been made by Lecomte du Nouy under Carrel's direction. These investigations led to the discovery of a normal, average curve of healing for wounds treated by Dakin's solution, with which the curve from any given fresh case may with advantage be compared. The curve is plotted out by measurements of the extent of the wound at intervals of four days. An analogous method applied in six cases of deep wounds showed that under certain conditions these wounds heal at least as rapidly, or even more rapidly, than superficial injuries. The blood circulation in the wound area brings to it those chemical substances which are necessary for retraction of the wound and for epithelial proliferation. If no intense or special microbic infection supervenes, this influx of chemical substances takes place in a regular manner and the date of complete healing can be predicated. If the process of epidermization is delayed or temporarily arrested by an infection, the continuing influx of epidermis forming substances leads to accumulation in the wound;

then, when the infection is overcome, the new process of epidermization progresses far more rapidly than under normal conditions and may even pass beyond the theoretic curve of healing. Infection seems to destroy only the epithelium, and to leave in the wound the chemical substances which activate epidermization. Additional observations led Tuffier and Desmarres to conclude that by applying a dry, absorbent dressing over a sterile wound healing can be caused to take place somewhat more rapidly than under the Dakin method. This is ascribed to the fact that, while all antiseptics antagonize bacteria they also affect the tissue cells and impede healing.

Complement Fixation Test in the Diagnosis of Tuberculosis.—A. C. Clasen (*The Medical Fortnightly*, March 15, 1918) states that good results have been obtained with Besredka's antigen, which is a filtrate of an egg meat broth medium upon which tubercle bacilli have been grown for several weeks. The author uses saline and alcohol extracts of various strains of human tubercle bacilli which is prepared as follows: the various strains of tubercle bacilli are grown on Petroff media, which is a solid media containing whole egg and veal juice. When a good growth is obtained it is generally washed off with saline or ninety-five per cent. alcohol. The whole is then shaken for twelve hours in a shaking machine, incubated for twenty-four hours at thirty-seven degrees C., then shaken again and finally filtered. The mixtures are next titrated for hemolytic, antigenic, and anticomplementary properties. With these antigens, without removing the lipins or protein constituents, nonspecific cross fixation has been avoided. The technic of the test is the same as that employed in performing the original Wassermann, using the sheep hemolytic system.

Anthrax Septicemia.—Roscoe R. Graham and Herbert K. Detweiler (*Journal A. M. A.*, March 9, 1918) point out the rarity of anthrax infection in man, and the far greater rarity of anthrax septicemia, and describe a case in which there was not only an anthracemia, but in which recovery followed treatment. The patient was a man thirty-six years old who developed a local anthrax lesion on his neck which went through the typical four stages. On the second day of the local lesion forty mils of antianthrax serum were given subcutaneously and the tissues about the local area were injected with forty per cent. alcohol. Two days later the patient's fever was still very high, his pulse rapid and weak and there was great edema involving the larynx. Twenty mils of serum were again injected. On the next day the condition remained about the same and a blood culture revealed the presence of the organisms in the circulation. The following day 100 mils of Dakin's chloramin-T and eighty mils of antianthrax serum were injected intravenously. In half an hour there was a severe chill, lasting fifteen minutes, and this was followed in a few hours by a fall in the fever and the pulse rate. A second blood culture was found negative and the patient progressed to a fairly rapid and a complete recovery. The local lesion was very slow in healing and seven weeks after beginning recovery the leathery, black eschar which remained was removed by digestion with a papain preparation.

Proceedings of National and Local Societies

PHILADELPHIA COUNTY MEDICAL SOCIETY.

Meeting of Wednesday, March 13, 1918.

The President, Dr. FRANK C. HAMMOND, in the Chair.

The Bacteriology and Serology of Pneumonia.

—Dr. JOHN A. KOLMER said that lobar pneumonia ranked next to tuberculosis in death rate and was endemic throughout the entire world, though certain races of people were known to be more susceptible to it than others, notably the South African black. It was also known that raw recruits in the army were particularly susceptible according to our experience with the troops on the Mexican border a year or two ago. The pneumococcus was known definitely to cause ninety per cent. of this condition clinically diagnosed as lobar pneumonia. He referred now particularly to the adult, the other ten per cent. may be caused by the streptococcus, the staphylococcus, or other organism. The more experience we had, the more carefully cases were studied, so the more we were convinced that the organism called the pneumococcus was practically the sole etiological agent of lobar pneumonia, though our knowledge of how the pneumococcus produces pneumonia was quite limited. It was well known from original researches that pneumococci might be found in the mouth, but we had no clear knowledge how the pneumococcus produced pneumonia. Careful blood pressure work showed that in about fifty per cent. the pneumococcus might be found in the blood. Whether it first entered the blood stream by lowering vitality or exposure to cold and localizes by tissue selection, or was transmitted through the alveolar spaces from the nose and throat was still an open question. Experimentally, we could produce pneumonia in our laboratories, but the mode of its production had no analogy to our knowledge of the disease in the human being. When the pneumococcus had located in the lung it produced the type of exudative ulceration known to all of us familiar with the pathology of lobar pneumonia. The symptoms were not only the local disturbances produced by the filling up of the lungs with exudate, but it was also possible that the pneumococcus by disintegration liberates a poison within the bacterial cell, which, entering the circulating fluids of the patient, produced intoxication. In addition to the toxins produced by the pneumococcus it was highly probable that part of the clinical picture of pneumonia was due to the absorption of products from the inflammatory exudate. They had all been particularly interested in this phase of the pneumonia problem during the past year and experiments indicated that the exudate filling the alveolar spaces contributed a poison which played a part in the symptom complex of lobar pneumonia. There was also found in the urine of pneumonia patients a product of the pneumococcus. The four different types of organisms classified as pneumococci were doubtless familiar to all present. Type IV was the usual type in the mouth of normal individuals and was less virulent than the other types. Type I was

highly virulent and produced about thirty-three per cent. of cases, particularly in this part of the country. Type II also produced about thirty-three per cent.; Type III, about thirteen per cent.; Type IV about twenty per cent. In children these percentages were slightly different, but our knowledge here was quite incomplete because of the difficulty in securing sputum for diagnosis. According to the work done, Type IV produced the largest percentage of pneumonia among children. The laboratory had also aids to offer regarding prognosis. Based upon a series of four or five hundred cases the relation of mortality to Type I is about twenty-five per cent.; to Type II, thirty-two per cent.; Type III, about forty-five per cent.; Type IV, sixteen per cent. Cases showing the pneumococcus in the blood stream had the gravest prognostic outlook. The dust of bedrooms in which lobar pneumonia patients have been treated contained the pneumococcus in from fifty to sixty per cent. of instances. It was of particular importance from the standpoint of public health and the epidemiology of lobar pneumonia that it be regarded as an acute infectious disease due to the introduction of a germ from without similar to the production of diphtheria by acquiring a virulent diphtheritic germ. The disease was very properly regarded as reportable, and, in certain large cities of the United States, it was quarantined. There seemed to be sufficient information to warrant the physician in regarding his patient as a potential focus for the spread of lobar pneumonia. Not all cases can be traced to contact with a previous one, but studies indicated that there are carriers of the virulent pneumococci, that patients may be carriers; also those in attendance upon such patients.

Symptomatology and Diagnosis.—Dr. ROSS V. PATTERSON thought that pneumonia of typical type offered no diagnostic problems to the practitioner of even short experience. Perhaps eighty per cent. of the cases of croupous pneumonia ran a typical course, were characterized by easily recognized symptoms, and easily demonstrated physical signs. It is in the remaining twenty per cent. that the real clinical problems arose and the diagnostician found opportunities for the exercise of his art. In a study of the clinical picture of pneumonia it should be remembered that it was a disease of protean manifestations with many divergences from type. There was not a single symptom usually seen which might not be absent, and, in some forms of the disease, the majority of what were recognized as classical signs were entirely absent. The symptoms were dependent upon the infection, the toxemia, the extent and distribution of the lesions and upon the individual and his personal peculiarities. In children apex pneumonia was apt to be attended with symptoms suggesting meningitis, and in some cases such diagnosis had been made. In double pneumonia we usually find one lung invaded one or two days after the first. This second invasion, however, was not as a rule attended by chill, nor necessarily with increased toxic symptoms. There seemed to be no very defi-

nite constant relationship between the extent of involvement in the lungs and the general constitutional symptoms. In massive pneumonia the lungs became completely airless, and the physical signs somewhat simulated those of pleurisy. Occasionally the lesions go from one part of the lung to another or from one part of the lobe to another, and we had various stages represented in the same or in both lungs. In abortive pneumonia the onset was sudden and violent, terminating even after a course so short as two or three days. This was the type often seen in able-bodied men. In the asthenic form, on the other hand, the patient was overwhelmed by the toxins, and symptoms resembling those of typhoid were present. The croupous pneumonia of childhood was often different from that seen in adults; it was pseudolobar in type and characterized by markedly nervous symptoms, often simulating meningitis. The character of pneumonia in the alcoholic was dependent upon whether it occurred in the steady drinker or the subject of an alcoholic debauch. In the former the onset might be quite characteristic, but the tendency to development of nervous and uremic symptoms sometimes complicated the clinical picture. In the steady drinker the clinical picture might soon take that of delirium tremens. Then we had the variations which occur in the terminal pneumonias in the course of chronic debilitating affections, such as tuberculosis, arteriosclerosis, diabetes, myocardial conditions in which the onset was not characterized by chill, and the disease was often not recognized. The intercurrent pneumonias seen in the acute infections such as typhoid, diphtheria or influenza, were apt to be due to the specific organism of those diseases and differ in type from the ordinary croupous pneumonia as seen when due to the pneumococcus.

Pneumonia in Childhood.—Dr. HARRY LOWENBURG, in discussing pneumonia as he found it in children, said we must address ourselves to the two types, pulmonary and lobar pneumonia. With reference to diagnosis of lobar pneumonia, in his experience convulsions rarely occurred in the onset, and he rarely saw chill; but the child suddenly became acutely ill more often with gastric disturbance than nervous phenomena. Physical signs were sometimes delayed for five or six days. Therefore this class of case occupied an important position in dealing with so called obscure temperatures found in children. It is important to note that the evidences of consolidation were not always early seen. He believed it high time that we discarded the term "central pneumonia" and also disregarded as a possible clinical entity, pneumonia without physical signs. Either the physician was unable to detect such signs, or the case was some other condition. With reference to the central pneumonia, so called, x ray studies had proven that most pneumonias in children began as subpleural manifestations and the auscultatory signs of consolidation did not appear until the consolidated area touched the hilus of the lung. The consolidated area acted as a transmitter of sound from the trachea to the ear. Until this was made complete the signs of tubular breathing were likely to be in abeyance. Therefore, he believed we should no longer speak of "central pneumonia." In

the beginning of these cases we learnt most by percussion, and the experienced clinician could feel a pneumonia. Abdominal pain is a very common symptom in children and a very misleading one in cases in which the physical signs were late in appearing. It had been his experience in at least three cases to be unable to decide between pneumonia and appendicitis, and he had had splendid company in his dilemma. In the differential diagnosis, therefore, we should search diligently for physical signs in the chest and speedy use of the x ray be made. It was important, also, not to neglect a rectal examination and by this method tenderness on the right side could frequently be demonstrated. In none of the cases, however, could we be certain of our diagnosis until the patient had recovered, been operated, or died and been posted. In children, the pulse respiration ratio was of no diagnostic value unless counted during sleep. The most important complication of lobar pneumonia was fluid. In the presence of a diffuse area of impairment associated with a marked sense of resistance upon percussion out of proportion to the degree of dyspnea, the diagnosis of effusion was probably correct. He regarded this phenomenon of vastly more importance than changing the level of the area of dullness with change of position of the patient. He believed many children with lobar pneumonia were assisted on the downward way by overtreatment and overstimulation, and believed we should maintain a "masterly inactivity"; carefully watch our cases, and adopt as he had done in his hospital service, a four hour interval. At the end of that time the pulse and respiration were recorded, the indicated medication given, the patient fed and let alone. The bowels, of course, should be opened daily. In bronchopneumonia, the child should be put in a room with fresh air that is not too cold. No stimulants should be given, except perhaps just before the crisis. He believed rest to be the sine qua non in the conduct of patients. They should be given morphin or codein when restless, provided there was no contraindication.

Treatment of the Pneumonias.—Dr. S. SOLIS COHEN said he had chosen the term "pneumonias" because almost every patient presents a different aspect, and clinicians, bacteriologists, and pathologists had recognized certain quite distinct types of the disease. The policy of "masterly inactivity" which had proven so successful in pneumonia in childhood in the hands of the last speaker, had proved very disastrous in the hands of the majority of the profession in lobar pneumonia in adults. It had been shown by statistics that the mortality rate of pneumonia had grown progressively worse with the progress of medical science. Pretty much all over the country two years ago the policy of "masterly inactivity" or the expectant treatment resulted in a death rate of from forty to sixty per cent.; whereas at the time Osler went over the statistics at the Pennsylvania Hospital, it was shown that under various methods of treatment the average mortality was about twenty-five per cent. It was said that every case of pneumonia began to die or recover from the moment of infection. While, however, the process of recovery might be impeded, the process of death and decay might also be checked and recovery aided. The same

factors might be potent for evil or for good according to the intelligence with which they are applied. The patient should be carefully watched for the dangers likely to occur. Cold fresh air to the aged and to the alcoholic was fatal, but for the average patient in good condition, cold air as well as fresh air was beneficial. This was best obtained by putting the patient on the uncovered roof, covering the roof only when storms demand it, but let him be kept thoroughly warm in his bed. The serum treatment in Type I infections had proven better than any other used, and he believed the rate of mortality was anywhere from five to ten per cent. At Chattanooga he was told that one case out of thirty-one patients died when treated with this serum. The polyvalent serum did not seem to be highly successful, and the next form of specific treatment was that of the bacterins. That word, bacterins, was not a proprietary term. It was introduced by the speaker himself, coined by him, given to the profession by him and to any manufacturer who chooses to use it. He had seen the most contradictory statements in discussions of the value of the vaccine or bacterin treatment. Then came the difference in type and the assertion that the vaccine to be useful must be specific. For the last three or four years he had been using the bacterins early with increasing frequency and for that length of time been prepared to say that they fulfilled the first hippocratic rule—of doing no harm. We were justified in making experiments with a therapeutic measure which offered some prospect of success, provided we knew that it did no harm. He was at Fort Oglethorpe and went through the hospital which was under the care of Dr. Charles H. Smith and Captain Arthur Dare, and with them was Dr. D. H. Bergey, assistant chief of laboratory. The organization and the work of the hospital were the best he had ever seen. With the consent of his superior officers Doctor Dare put into execution at the hospital the treatment of the pneumonias with a mixed vaccine and in more than one hundred cases of lobar pneumonia treated with this vaccine the death rate was less than six per cent. Midway between the vagueness and futility of the expectant treatment and the certainty of the specific treatment is that to which he had given the name of the "definite treatment." This consisted in the use of medicine and hygiene measures, not haphazardly, not merely after a period of "watchful waiting" for dangers to occur, but in a definite association for definite purposes and in advance of the dangers. It substituted preparedness for locking the stable after the horse was gone. It followed the doctrine of Jacobi who said before this society before the days of antitoxin, "The great danger in diphtheria is heart failure." The time to treat heart failure was before it happened. That has been the basis of that treatment which he had gradually assumed and to which I have given the name of the "definite treatment." This basis of the "definite treatment" was fresh air, all necessary therapeutic measures, good nursing and hygiene. Outside of Buckley, in a series of over 400 cases, the mortality under this treatment had been less than sixteen per cent. At the Jefferson Hospital where we get the best results

the mortality had been less than eight per cent.

Dr. A. C. MORGAN remarked that the diagnosis of pneumonia should be made before the physical signs appeared. The earlier the serum or specific treatment was given the better the hope of recovery. The previous history of the patient should impress them, since they knew pneumonia had a tendency to recur. A patient with such a history who developed marked coryza with prostration disproportionate to the symptoms should be treated as a case of suspected pneumonia and be given the serum or vaccine dosage at once without waiting for physical signs. Frequent swabs of the nose should be made to determine the strain as quickly as possible. There had been an increase apparently of the ether pneumonias within the past year. This might be due to lack of care in technic; operative or, possibly, because of the tremendous need for ether throughout the entire world, there had been some unintentional contamination in its manufacture. He thought the discussion of pneumonia may be summed up under its mechanical and toxic features. But little pneumonia, from a mechanical point of view, was required to produce a fatal termination of the disease in a patient with a myocardial degeneration.

Dr. JOHN F. SINCLAIR said he agreed with Doctor Lowenburg regarding pneumonia in children. He was convinced that one of the reasons for the greater frequency of pneumonia in children seen in the hospital and dispensary than in private practice was neglect of care of the nose and throat. If, at the first appearance of coryza or pharyngitis the condition were treated the incidence of pneumonia among children would be markedly decreased. He also believed with Doctor Lowenburg that "central pneumonia" is a term we had no right to use regarding the pneumonias of childhood, though this might not obtain in the pneumonias of adult life. I would emphasize also the value of light percussion in eliciting the pneumonic area. The puzzling point of abdominal pain had been well stressed. The complication of otitis media, not here mentioned, had been found in a small series of cases of lobar pneumonia to have been present far in excess of eighteen to twenty per cent.

NEW YORK ACADEMY OF MEDICINE.

Mass. *Wetland Habi* at the Hotel McAlpin, New
York, February 28, 1907.

10. *Examine How to Use the Chart.*

Symposium on Guarding Children in Wartime.

Dr. S. J. Fennell, who opened the meeting with a short address, calling attention to the timely importance of safeguarding the health of the children. No two things might seem more dissimilar than war

city of Medicine, the Women's City Club, the Bureau of Child Health, the Royal Society of Medicine, the Royal Society of Great Britain and Ireland for the Study and Prevention of Infant Mortality, Women's National Health Association of Ireland, the Women's Municipal League, the Bronx County Medical Society, the Brooklyn Pediatric Society, the Babies' Welfare Association, and the Civitas Club.

and children, but the connection between them really was very close. After training and equipping the fighting men of a country at war, the next important step was to look to the second line of defense, the children. At the time of the Boer War, so many men applying for service were rejected that attention was directed to the need of better physical development of the young men of the British Empire and to the means whereby their physical defects might be avoided or overcome. Because of the falling birth rate in France, which interfered with keeping the army up to its proper quota, child welfare assumed an important aspect. Even in England the decreasing birth rate had been held responsible for the loss of as many as 500,000 potential lives. Germany and Hungary were making much more extensive efforts toward the preservation of child life than ever before because of their declining birth rate, for which the war was responsible, as it was for the increasing infant mortality due to undernourishment among children. America might have to meet this problem later if the war continued. Every student of public health knew that it was the baby who was first to react to the economic conditions that obtained in a community. In this country, the effect of the war so far upon the children had been largely due to economic causes. In New York City there were today 216,000 children suffering from undernourishment because of the increased price of food.

The first consideration in a national campaign of this kind was to secure proper birth registration in a number of States where this lack prevented formation of accurate statistics. The baby mortality now was criminal, and one of its most significant features was the fact that it was an index to the health conditions of the country; the death rate became less and less an indication as the age advanced until the adult death rate which was practically of no value as to the sanitary or hygienic conditions of a community. Groups of people working in their own community could do the most effective child welfare work. The children of today were the men and women of tomorrow who would be so greatly needed when the war was over. It was not so long ago that in New York City 144 infants living at birth per thousand died annually; last year the death rate was only eighty-eight per thousand living births, but a still higher goal must be reached. Dr. Truby King, who had reduced the infant mortality rate of New Zealand to five per thousand living births, the lowest rate in the world, would perhaps indicate in his address how this could be done.

Child Welfare Work in New Zealand.—Dr. TRUBY KING, who had stopped over in New York on his way to England to reorganize child welfare work under the British Government, said he appreciated very highly the invitation to give an address on a subject of such tremendous interest at the present time. In the reduction of the infant death rate of New Zealand several factors had come into play. One of the most important was the work of the eighty committees of women, scattered throughout a population of one and a quarter million people, which had been organized throughout the country. Most of their work, it might incidentally be mentioned, had followed precedents established in

America, being founded on the principles laid down by Professor Roche, of Harvard, and Doctor L. Emmett Holt, of this city. The success in lowering the death rate in New Zealand was due to having practised those principles, the special work done having been the adaptation of this knowledge to the conditions of New Zealand.

The simplest way to present the whole subject was perhaps to outline briefly how a beginning was made and what had been done since. As in other countries, the chief thing which caused New Zealand to turn her attention to child welfare work was the lamentable inefficiency of many of the young men who applied and were examined for military service. They were supposed to be fit, but Major General Sir Frederick Morris was astonished to find that only forty men out of one hundred were really so. Most of the defects were preventable, and the main cause had been the inability of the mothers to nurse their babies, leading to a vast amount of bottle feeding, which meant ill formed jaws, poor teeth and all forms of intestinal and respiratory difficulties.

The military efficiency of the Japanese had been revealed by history. In that country, the population being mostly agricultural, the women lived an outdoor life, wore loose clothing, were well developed, and all nursed their children.

Since the application of scientific methods worked out so well with crops and live stock, and with the example of Japan in mind, it seemed worth while trying with the children. It was evident attention must first be given to the known requirements of mother and child, to the simple laws of health and nursery hygiene, so the first step was to secure a nurse to go about among the mothers, giving instruction. After doing this work for six months, many of the women who heard of it began to realize the value of this kind of service and committees of women were formed who undertook some of the responsibility of the work, thus relieving the speaker to a considerable extent. The committees represented all grades and classes of women and all kinds of religious persuasions. Articles were published in the weekly papers on the care of infants and children and this had always been kept up. In addition a number of pamphlets were published, such as "Baby's First Month," "How to Feed and Care for the Baby," etc. Lectures were given demonstrating the value of proper care for children, employing the illustrations taken from the farm and dairy. A school was established and a hospital for the training of nurses in infant welfare work. Through these various agencies the result of enormously lowering the infant mortality statistics was brought about. The work was supported at first by voluntary contributions, but the government soon recognized its value and gradually extended its assistance, until at the present time it was giving five or six dollars for every dollar contributed voluntarily. It furnished free transportation for the nurses and contributed help and encouragement in many ways without taking away the interest and initiative of the women's committees. The work itself was carried on through voluntary agencies, though reports were regularly sent to the government.

The equable climate of New Zealand, very similar to that of California, had been an advantage

which perhaps made it easier to get results than in a more rigorous one. Where there were such variations of temperature as in the United States a little more attention might be required to certain details, but it was not unreasonable to expect equally as good, if not better results because the changing temperature and the lower temperature was more stimulating and should produce a stronger and more vigorous race.

All the factors contributing to these results had not been evolved hastily within the background of the war, but had been a long time in developing; it had grown slowly and deliberately, and by working first with women of a higher social class, from above downward. It had seemed to be a duty to give this knowledge even to those who were able to pay for it. All classes attended the public schools, high schools and universities which offered knowledge to the people, so why should not this special knowledge, so essential to the welfare of the race, be given to every mother, no matter to what class of society she belonged. School girls had been taught the care of the baby. This was first tried in the hospital with the sick babies, but ailing babies did not seem best calculated to develop a love of motherhood in the young girls, so that now a few normal babies were kept for the purpose of teaching.

Another factor in securing the low infant mortality rate was the spirit of competition. The medical profession, always anxious to lend its support to methods of preventive medicine, had heartily endorsed the movement to lower the morbid statistics of infants. They fully realized the advantage of this in many ways. In fact all classes of people had given thought to the conservation of its adult life through care in infancy for many years.

The time par excellence for the growth of the brain and nervous system was during the prenatal period and the first two years of life. The capacity of the individual was determined during the first few years of life. The whole future of the individual was determined for him before he was four years old, just as that of a calf was determined by the time it had reached the age of six months. That so many infants survived bad care was due to the fact that nature was often beneficent and safeguarded the child even at the expense of the mother's health. Very unpromising babies often turned out well, but these things only served to emphasize the importance of prenatal care.

Plenty of cool pure air was of inestimable importance. The mother and child should not only have separate beds, but in addition a stream of fresh air should flow between them. In the hospital for training nurses in baby care, the babies were kept from twenty-four hours to six weeks, but they were returned to their homes as soon as possible. There was a separate room for the mothers in which they sometimes stayed because of lessening milk supply; frequently the mother's milk supply had been restored after it had been absent for several weeks. There were various graphic methods of teaching the mothers the relative value of different kinds of food, and instruction in regard to proper clothing. Special attention was given to the matter of diet and particularly vigorous chewing of their food. Proper mastication was es-

sential for the proper development of the jaw and teeth as well as the assimilation of the food.

A more virile and vigorous race would result from living simply and properly and largely in the open air. In New Zealand there were many open air schools and the children in these schools developed greater physical strength and mental alertness than those who studied indoors. They had also a just estimate of the value of swimming than which there was no more stimulating form of exercise. A swim, rubdown and twenty minutes of active exercise greatly reduced the percentage of inefficiency.

By due attention to the matter of hygiene, even many delicate women might become healthy and give birth to healthy children, while even a strong woman could not disregard it and expect always to have vigorous ones. Every mother should be taught these essentials. While the whole world today was concerned about the falling birthrate, New Zealand, though only one thirtieth the size of the United States, or one half that of France, felt just cause for satisfaction in contemplating the fact that her infant mortality rate was only 5.1 per thousand, the lowest in the world.

The Plans for Children's Year.—Dr. JESSICA B. PEIXOTO, professor of social economics at the University of California, believed that the infant mortality rate in the United States would before long rival that of New Zealand after the start of the campaign to be undertaken under the joint auspices of the Women's Committees and the Children's Bureau of the Federal Department of Labor, to save 100,000 children in America in the second year of the war.

In this proposed program there were four main features: The protection of infants and mothers; the protection of mothers with children approaching adolescence, where the mother was confronted with the problem of providing for such children on an insufficient income and with many other perplexities; supervision and regulation of child labor, and the provision of decent and sufficient recreation for adolescent children.

In planning the Children's Year, the period of infancy was not the only one in the child's life to be considered. Children of all ages as well as their mothers had been thought of. The Woman's Committees of the Council of National Defense being already organized, it had seemed wise to work through them rather than to form a new organization.

The campaign was to begin on April 6th, the anniversary of the entrance of the United States into the war, and the slogan for the year was "Save 100,000 Babies; Give the Children a Square Deal." The campaign would continue until every measure humanly possible to protect the lives of those at home, and especially those little ones upon whom the future of the country rested, had been instituted in every State, every city and every home. A number of babies had been assigned to every State as its quota for the year. New York's quota for the year was 1,000. A number of States would probably complain that their assignment was unjust, but this would be because of lack of proper birth registration and the complaints would at least direct attention to this and might do much toward having it supplied.

The Children's Bureau of the Federal Depart-

ment of Labor had called upon the State Councils of National Defense, and particularly the State divisions of the Women's Committees and 5,090 such committees were already at work. Where the Women's Committees were very large, they had been divided into subcommittees, taking different branches of work, such as a subcommittee on child hygiene, another on child labor, another on recreation, etc. These subcommittees would coordinate their work. Volunteers were needed to help in clinics and infants welfare stations. Physicians would be invited to give information with reference to conditions that caused a high mortality in infants and to point out how they might be corrected. The local committees would make a study of local problems and make suggestions, such as how the high cost of living might be met by those of limited finances. Many nurses and doctors, it was hoped, would volunteer to work from twelve to twenty-four hours a week.

This work would be an act of patriotism almost as helpful as donning a uniform and fighting at the front. Everyone in the country should stand first for wholehearted support of the Allies, but secondly they should stand for nationwide protection of the population at home, for the quality of future citizens depended in part at least upon the failure or success of Children's Year.

Book Reviews.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

Materia Medica and Therapeutics. Including Pharmacy and Pharmacology. By REYNOLD WEBB WILCOX, M.D., LL.D., D.C.L., President of the American College of Physicians; Professor of Medicine (Retired) at the New York Post-Graduate Medical School and Hospital; Consulting Physician the St. Mark's, to the Nassau, to the Ossining, and the Eastern Long Island Hospitals, etc. Ninth Edition. Revised in Accordance with the U. S. Pharmacopoeia, with Index of Symptoms and Diseases. Philadelphia: P. Blakiston's Son & Co., 1917. Pp. xii-860. (Price \$3.50.)

This book is as comprehensive in detail as its title, and so clear in directions and distinctions that even a pharmacomaniac could not, otherwise than wilfully, do himself any harm. The writer has borne in mind that those facts which "every one knows" are generally accepted but not understood, and he has spared no pains to be extra lucid on these points. The properties of drugs are well classified. Take our old friend Caffeine; it has External; Internal, alimentary canal; heart; vessels; muscles; respiration; nervous system; kidneys; and Metabolism, added to which are its therapeutic action on the same. The volume certainly is a useful friend to have on the desk for constant reference.

Traitement du tabes. (Meningomyelitis syphilitique postérieure). Par E. LEREDDE. Paris: A. Maloine et Fils, 1918. Pp. vii-487.

This is a large and valuable monograph on the treatment of tabes from the organic point of view. It contains approximately 500 pages, 300 of which are made up of analyses of the case histories of patients who have received from 3 to 30 injections of arsenobenzol, to which mode of treatment the book is exclusively devoted. The first chapter consists of the technique of treatment by means of arsenobenzol; the second of the incidents and

accidents following upon the injections such as Herxheimer's reaction, thermic reaction, radicular and cerebrospinal reactions, gastric, sensory, bulbar, and fatal accidents. Chapters three and four take up a discussion of the effects upon the reflexes, sensory, motor, genital, gastric, intestinal, and general disorders, etc. The final chapter discusses the case histories as already noted. Leredde has always been an opponent of the theory that tabes was a parasyphilitic disease, and has steadfastly maintained that tabes and paresis should be considered as direct syphilitic reactions. In a further section the author discusses the treatment of the morale of the tabetic, but it cannot be said that he has approached the question with anything like the thoroughness that has been given to it by such a clinician as Maloney to whom we owe one of the best discussions of the psychical factors involved in tabes. The statistical part of the volume analyzes 87 case histories treated between 1911-1917. Taken all in all it is a frank statement of experience, given in great detail without any discussion of the why, the wherefore, or with explanations of any kind.

Les Blessures du cerveau. Formes cliniques. Par CH. CHATELIN. Preface du Professeur Pierre Marie. Deuxième édition remaniée et augmentée. (Collection Horizon précis de médecine et de chirurgie de guerre.) Paris: Masson et Cie, 1918. Pp. 200. (Prix 4 fr.)

Wounds of the skull by reason of their importance and, of recent years, by increase in their frequency, amply merit being made the object of special study. In Pierre Marie's service during the years 1915-1916, five thousand patients suffering from head wounds, involving the brain, were examined. This small brochure, one of the Horizon Collection, gives a comprehensive summary of this material by one of Marie's assistants, Chatelin, who has been closely associated with his chief for the past six years.

In the preface, written by Marie, he tells us that many new things have been learned from the war's vivisection methods, particularly in the fields of localization, of hemorrhage, and especially cerebral softening.

A new scheme of radiographic examination of bismuthated convulsions has developed much new knowledge of topography and localization, and careful observations of wounds of the calcareous areas, and the optic radiations have permitted important generalizations concerning the visual functions.

In his preface Marie emphasizes the fact that wounds of the brain, especially in the early months of the war, were operated upon too early, too often, too much, and much too near the front. Quoting Martel, who has written an excellent small manual for this series, he says:

"There is generally little urgency in operations upon the brain and those surgeons who would operate upon the skull as they would upon the abdomen are in error. If the abdomen, like the brain, only contained open organs instead of closed ones filled with septic matters, one could treat them alike. There is really no urgency in surgery save for lesions of the digestive and circulatory apparatus." Notwithstanding its brevity, this manual of 200 pages will be found very satisfactory.

Births, Marriages, and Deaths.

Married.

BEGG-CONFRE.—In New York, N. Y., on Tuesday, April 9th, Dr. Colin Luke Begg, of New York, and Miss Susanne Confre, of New Orleans, La.

Died.

EWING.—In New York, N. Y., on Sunday, April 21st, Dr. William Alexander Ewing.

MOORE.—In Rochester, N. Y., on Friday, April 5th, Dr. Edward Mott Moore, aged sixty-eight years.

NAGIN.—In New York, N. Y., on Friday, April 5th, Dr. Percival Louis Nagin, aged thirty-two years.

PARSONS.—In Chicago, Ill., on Saturday, April 6th, Dr. William Parsons, aged seventy-four years.

SILVERMAN.—In New York, N. Y., on Thursday, April 11th, Dr. Maurice J. Silverman, aged fifty-three years.

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Original Communications

THE TRUE EPILEPTIC.*

By L. PIERCE CLARK, M. D.,

New York,

Consulting Neurologist to the Craig Colony for Epileptics

From time immemorial, the idiopathic epileptic has been considered a peculiar type of individual (1). The salient features of the personality to be found in these individuals possessing such a defective primary endowment are egocentricity, supersensitiveness, marked emotional poverty and rigidity. For years this character type has been supposed to exist as a direct result of the epileptic seizures. It has also been assumed that the amount of makeup which the individual possesses goes hand in hand with the length of time the epileptic has had his disease, together with the severity and frequency of attacks. However, a number of clinicians have come to recognize this latter statement is not necessarily true, and have stated that the character develops *pari passu* with the convulsive part of the disorder, and that they are not essentially in the relation of cause and effect.

Some three years ago I undertook a study of the character makeup (2) in a small series of essential epileptics *before* they had their first attack, and found these potential epileptic individuals had nothing wanting in the complete picture of the character as seen in those suffering from a long enduring and severe epilepsy, though many times the character faults were not so glaring as in the frank epileptic; there was also a wide latitude in the quality and amount of defect encountered. Inasmuch as the exact number of cases previously reported was small, it occurred to me a more painstaking analysis upon a larger material might be worth while, so I have drawn from a series of fifty consecutive cases in private practice which I have had under careful observation.¹ It is becoming more and more

evident to epileptologists that not only are the detection and careful delineation of character of chief moment in the final diagnosis of essential epilepsy, but prognosis and treatment must largely rest upon such data.

It is interesting to compare the attitude of trained clinicians in epileptic colonies and physicians in private practice toward the epileptic individual. The former live more or less in intimate contact with their charges; they recognize their peculiar type—one scarcely detected by the outside physician. Hence, they base treatment largely upon the defects and capabilities of their charges, and grow less and less to depend upon the seizures as such, or to lay stress upon a pure drug or special organotherapy, a practice so common with the ordinary physician; yet the position of the trained epileptologist, until recently, has been assumed by many to mean that he is unacquainted with the newer and ephemeral panaceas for this great disorder, and has arrived at therapeutic nihilism. The fact is, the colony physician has a broader view of the whole problem. The physician in private practice sees little of his patient's personality and individual reactions, and often only obtains a record of attacks and their allied symptoms upon which he may base his therapy. If the institutional physician received his patients in an earlier stage he could probably considerably alter the pessimistic prognosis of epilepsy which now obtains. At present, he receives not only the most badly deteriorated cases, but often those so fearfully handicapped by drug and surgical therapy that it takes months to rid the epileptic from these well meant but misdirected remedies, so called. But both sets of doctors are often driven to the position they assume by insistent and expectant relatives, who view the disorder, not only as a family blight, but frequently as a disease which if some one symptom were removed all things would be right. Oftentimes they focus their attention on the seizures only, and demand that they be suppressed, no matter what the cost may be to the individual's health. It is to be regretted that the majority of textbooks continue to state that sedatives are the chief, if not the sole therapy for essential epilepsy.

During infancy, the objective demarcations of the epileptic character are difficult to detect; the infant has a very limited capacity to designate his general protest at adjustment, and his extreme sensitiveness is largely shown in fits of meaningless crying. Again, so soon as this particular type of difficult

*Read before the Academy of Medicine at Northern New Jersey, February 26, 1918.

¹The data used in this study is not only drawn from the material above noted, but also embodies the experience, less completely recorded for years in the examinations of many thousand epileptics. A few remarks, for instance, that in a group of 1000 such frank delineations of the potential epileptic character from patients and relatives as here summarized. The indictment of the defect of makeup is, however, strong enough to bear out the main contentions of the thesis without necessitating a more impersonal and scientifically planned study. What the latter might be made to yield, only the future study of these children before epilepsy is even expected to develop can show. A modified scheme of the Hoch-Amsden plan of studying the personality was followed.

Effort has been made to obtain data of the personality before the onset of attacks, but obviously, in a material of this sort, it is difficult to separate them completely, and while for the most part the study is based on the pre-epileptic stage, some of it necessarily had to be taken early, at a period soon after or at the time attacks were in evidence.

child is recognized, the whole family quickly learn to yield to its extra demands. The majority of cases show extra irritability from birth. One history reads: "He was considered an irritable and nervous child from the day of his birth." A second "fretted continually at the contact of rough clothing." Another "was nervous, and persisted in infant demands long after weaning." A fourth "cried continually the first three months." A fifth "was easily startled by sound, was peevish, wanted his own way, and got it." Others had "bad nights," had to be nursed frequently, woke up crying every few hours, and were delicate, sensitive babies. One infant nearly went into spasms at the sound of an air brake. Still another had to be rocked continually, and slept only during this care. "He always demanded to be with the mother, and went into fits of inconsolable crying during her absence," is the history of another. Only a small minority had a fairly normal mood and deportment, and but two or three were classed as normal, good babies. Nearly half the series had bad digestion, and were constipated from birth; this physical disorder, however, did not necessarily coincide with the temperamental difficulties of infancy just cited. The great majority showed irregularities in the development of easy adjustment to light, sound and contact. While nearly all were excitable, hypersensitive infants, which seriously interfered with normal development of disposition and proper training in nursery ethics, it was decidedly the exception to find the potential epileptic child retarded in any of the physical criteria of development; they sat up, crept, talked, and walked at the usual ages. A factor most frequently noted in the supersensitive, egotistic infancy of these individuals was the extreme lability of mood—"one moment contented, and the next, irritable, beyond power of appeasement." The consecutiveness of purpose in play, or capacity to be amused, was short lived, requiring constant attention and variety of interest. As one mother expressed it, "The baby seemed to want something which we were never able to find." As might be expected, the difficult traits continued long into the weaned period. As another mother stated, "My boy seems never to have grown up, and his rigid attitude of mind as a child is still in evidence in his adult life;" a statement which is a crude embodiment of that which we call the frank epileptic character, of traditional description.

The data is remarkable if we bear in mind that it was more or less voluntarily offered by parents and relatives at the initial examination, often years from the date of infancy, and given, too, by those who most frequently wished to shield the individual from a too harsh criticism of later glaring faults of character. No record of defects in infant personality was recorded when it seemed within the ordinary range of the wide fluctuations well recognized for all infants. Tantrum episodes were most common in these difficult children. Indeed, though not a few were already designated as "spoiled babies," because of the leniency of the home, many of these children continued to be difficult, but did not break down completely into frank epileptic attacks until more exacting social demands were encountered outside the home, in school, etc.

Whatever view one may take of the primary endowment of the potential epileptic infant, no one can deny that, as a rule, it is in sharp contrast to that of other neurotic and psychotic individuals, and that the supersensitiveness, egoism, and lability of mood, as well as the curbing of these undesirable traits, not only defy all ordinary systems of training, but are most often carried over into the next great social test of childhood. It enormously handicaps the individual child in meeting a precise and demanding adjustment to its fellows. We shall next see how the persistence of such traits hinder the intellectual development, as well as cramp and distort the social life of such children.

Of the fifty individuals under study, three-fifths of the number got along fairly well in their school work, and were classed as average grade pupils. Their education was often onesided, and, as a whole, frequently not up to their opportunities, not so much because they were essentially slower in learning, but their attention and concentration were not good. This condition was probably due principally to the inconstant fluctuations of mood as well as interest, and also accounts in no small degree for the irregular results obtained by psychometric methods in testing the intelligence of the epileptic adolescent. The other two fifths showed a marked inability to concentrate their attention, so that they were usually behind in several studies, such as algebra and mathematics, or history, literature and Latin. As in normal children, though more marked here, many who were able to handle languages were unable to cope successfully with mathematics, and *vice versa*. Because of their extreme "nervousness," many were unable to attend school and take the normal schedule. Some were tutored for such short periods as a half to one hour daily. Several found the school discipline and routine so intolerable and irksome that not only were they allowed freer conduct in the classroom, but were often exempted from attendance, except for short periods at a time. Inability to adapt to the school routine was shown not only in inattention, restlessness and irritability; they often looked pale and haggard, pupils of eyes were dilated, they grew lethargic and sullen, or they sat day dreaming and yawning, although not really sleepy. They often grew to hate school routine, and in many instances could not be induced to return to it when the demand upon them was too rigid. Not a few complained of headache and exhaustive fatigue when the usual physical evidences were wanting, and many times the parents were troubled to ascertain just how much these states were due to physical causes or were mentally induced, as, in many instances, having gained the desired freedom from school, the symptoms quickly cleared.

Some pupils were attentive, but learned so slowly that they made very poor progress. One boy got along fairly well up to the middle of his high school work, then showed a definite lack of interest. Inquiry revealed the fact that he failed to see the practicability of the subjects taught. He finally refused to attend at all, and became a messenger boy rather than continue his education. Another boy was a genius in mathematics, but written recitations in other subjects were so uninteresting and difficult

that he hardly learned the rudiments. Ultimately he became an inventor of no small attainment, but never read a newspaper, never voted, and was unacquainted with the simplest social requirements. One boy was very fond of music, but was "too musical" to submit to practice, and though he could improvise some "wonderful chords," his talent came to naught.

As might be expected, none of the series had voices other than harsh and unmelodic, and were strangely without even a fair sense of musical phrasing and rhythm. Two girls had years of voice culture, and though they were capable of holding high notes, and the voice was clear and strong, the tone was without cadence and stress, and in its metallic, unresonant quality displayed no real vocal art. None showed even mediocre talents in any of the arts. The handwriting of nearly all showed defects in construction, for the most part was cramped and childlike, and continued to be so even in advanced life. The one or two who possessed some grace in penmanship showed a total lack of character. A few individuals showed an early desire to "write," especially poetry, but the results were crude and childlike. One, however, published some poems not without merit; their peculiar morbidness and passionate longing for the peace and serenity of some other existence enhanced their value, but the very sameness in motive narrowed their appeal and interest. Another attempted short stories, which contained the same morbid qualities shown in Dostoevsky's works.²

One boy aspired to be a great physician "over night," as his parents characterized his ambition, but he showed no real inclination to take up the study seriously. His unimaginative scope of desire was so ill met in the ordinary school studies that his parents permitted him to take a small mercantile position, where the variety and spice of seeing big things done were for the moment satisfying. Two others, after being unable to get on at school, took up governmental positions as boys, and continued this for years, but the exhausting and humiliating routine, the lack of being consulted by their superiors, made not a little stress, which seemed to precipitate their disorder in later life, as well as early mental deterioration. The acrid bitterness which they manifested toward their associates intensified their actual "loneliness," although connected with a great and vital part of the federal government.

In at least a dozen cases, as school pupils these potential epileptics were restless, turbulent, argumentative and quarrelsome in the extreme. Some continued to battle unequally against the odds of the school discipline and that of their playfellows, until the physical and mental stress of combat precipitated the onset of their frank disorder. Or they gave up the struggle and grew more sensitive, but none the less self contained and egotistical, became lethargic and indifferent, and emotionally deteriorated in habit and initiative, finally developing more

marked epileptic reactions in *petit mal* and *grand mal* attacks.

Surveying the case material as a whole, these potential epileptic children carried their innate defects of infant personality into their school life, and their poor adaptive capacity made normal adjustment to the school and its environment impossible. We find them vague and irresolute in the purposes of the school, with poor power of tranquil and sustained attention, and practically incapable at best to gain a well rounded education. Nevertheless, even with this poor school showing, it was practically impossible to find a single instance of self depreciation or a sense of inferiority. They often showed an exaggerated sense of pride in self and family, and expected others to look up to them and realize "who they are," not because of any obvious laurels, but through a sense of innate superiority, separateness and self sufficiency. One girl thought because she belonged to a well known family she "didn't have to be nice to people if she didn't want to."

Singularly enough, the potential epileptic exercised little imagination in work and play, unless it be, as in rare instances, in the one line in which he excelled, as the inventive genius previously cited. He might become keyed up and overactive when playing, but the activity was rarely entered into in real participancy with his companions. Most frequently he demanded the leadership, and directed without actually joining in himself. Fully a third showed a leaning toward solitary play, rather than a free give and take attitude with the group. No doubt the innate defect of social adjustment seriously interfered with team work. One child in particular, when the mood was stable could play happily with four other children, but on "irritable days" could often "endure" only one, and even that one playmate had to be carefully selected, so as to avoid too high a tension in play. As regards athletics, it is a known fact that at colonies for epileptics it is well nigh impossible to get many out of several hundred to engage in actual physical training, and make them present a fair showing. Even though one is dealing in the latter instance with those afflicted with the outspoken disorder, the potential tendency of indisposition to a real ambitious desire and enjoyment of active sport is not essentially different from that which obtained in the preepileptic life.

In a comparative study of the activities of the two sexes, on the whole, the girls had a tendency toward the tomboy type, while the boys were equally divided between liking to witness or mildly engage in sports, and being quite indifferent to them. The potential epileptic child is not versatile in his ability to create continuous and varied interests. It was common to note that they easily tired of one thing, and either played too hard or spent their energies in a desultory manner. Several of the boys liked mechanical toys. Several had "Meccano" sets, but only one exercised ingenuity in constructing things not given in the book. One boy was fond of electrical toys and making wagons, and in later life was very handy in doing odd jobs about the house, fixing

² This Russian author also was sensitive and there, as his characters depict the morbid traits that he himself possessed. In one of his books he describes the typical epileptic attack with its striving to obliterate reality, and the flight to heaven where all is peaceful and serene. Dostoevsky said that for one brief moment of the rapture which he felt during an attack he would be willing to give ten years of his life.

bells, etc. Another liked tools and blocks, but was very tense when playing. As there were very few boy playmates in the neighborhood, one little boy played with his little sister and her friends, and loved to tease and be the "whole thing"; this boy's dancing teacher designated him the most difficult boy she ever had to deal with, for he kept everything and everybody "stirred up." As a characteristic of one young man who has always been overactive, it was told that as a small child he was given a little music box, which he played with his right hand until his arm became exhausted, then turned it with his left hand until he fell asleep from exhaustion. One little boy liked to ride his velocipede on the porch, would back up, then go ahead, and continued this pastime for so long that it grew monotonous to watch him. One little girl, a strong and active child, was fond of animals, particularly the horse; her conduct was very wild; she never cared for dolls, but loved to climb about and run. Another girl was fond of tomboy sports, and paid no attention to dolls. Another liked playing with dolls, which she mentally represented as characters in books, and consequently the imagination of the authors sufficed. One little girl, who was rather clumsy, liked her tricycle, but had to be "stirred up constantly" to counteract her innate tendency to inactivity. Others liked to engage in "real work" about the house and garden when they felt so inclined, but did not wish to be pinned down to stated duties.

As may be surmised, in no activity of sport, work, or play did these children show special grace, dexterity, or unusual skill. For the most part they were slow, clumsy, and grossly incoordinate. Nor did they seem aware of these defects, and show a genuine desire to overcome them. The continual competing with oneself for perfection, often enough encountered in normal children, was curiously absent, in spite of the fact that not a few were keenly aware of the imperfections of their associates, and had little tolerance for mediocrity of attainments in others, the presence of which was often the source of argument and quarrels.

The majority of the children were reported as disobedient, but about a third were described by the parents as obedient, oftentimes, however, qualified by such reservations as "obedient, but always wanted to be shown the point before she did a thing"; "obedient, but inclined to be argumentative"; "obedient, but always wanted his own way and did things grudgingly." Nearly all did not like to have their mistakes pointed out, and frequently considered such acts as hostile. Many were so stubborn that in correcting them the parents felt they were "up against a brick wall." In obtaining such data the examiner was most frequently aware, as previously stated, that the particular protecting attitude of the parent shielded more than it revealed. Time and again from collateral sources actual data was forthcoming to show that almost invariably the child supposedly obedient, if the statement were not glaringly false, was so "on the surface only," and so soon as the child grew older the apparently subconscious mask was discarded, he became openly rebellious and took up a line of conduct but little

less socially objectionable than that in evidence after the frank disorder had become thoroughly established.

As a whole these potential epileptics were reserved. They not only did not keep up their "end" in conversation (due often to self engrossment, or a disinterestedness in the world at large and a resultant poverty of ideas), but the absence of a sense of *noblesse oblige* usually rendered them disinclined to make the effort to please where they were not interested. Although all were unusually selfreliant in marked contrast to the psychoneurotic, they were nearly all "mother attached," i. e., they derived great comfort from the indulgences and pettings of the mother. This love, however, was, like that of the infant, onesided in character, and as far as these children were concerned, was born of considerations to be received from the attachment, and not of a true love of expressed tenderness or sacrifice of personal comfort.

As might be expected, the majority were conceited and egotistical, and a great number given to open self admiration, extreme personal care, and paraded themselves before the mirror while preparing for the bath. Although rarely "foppish," the majority derived much pleasure from being neat and well dressed, and were often inclined to wear inappropriate dress and jewels in the mornings. Several little girls had an exaggerated demand to have their dresses hang "just so," and garments had to be ripped and refitted until they quite suited. Some of these children worked themselves into tantrums if underwear was wrinkled, stocking legs not perfectly smooth, etc., while others fell silent and showed by their appearance that the clothing was not to their liking and a great "cross" to bear. One little girl was so sensitive to touch that she discriminated her friends from those she didn't like by the quality of handshake.

Many of these potential epileptics were punctilious in demands on servants and employees, and usually let no opportunity pass to emphasize the distinctions of their class over menials. They all emphasized their dislike for sham in others, and were merciless in sooner or later "nailing their companions to the cross" for little idiosyncrasies. The majority were truthful in ordinary affairs where their own desires were not too keenly in question, yet often misstated events for their own advantage. They had a keen sense of honor in others, and seemed never to forget or forgive a breach of it.

As natural in such a makeup, these youths frequently blamed others for their own faults; or minimized or excused them as compared with those found in others. This trait, often seen in early life, continued throughout their lives, and has social and medicolegal bearings upon the limitations of full responsibility not often duly appreciated by the public in general. As the character deteriorated (as it did in the majority of cases some time before the actual onset of the attacks), it was extremely difficult to discriminate between the defect due to lack in primary endowment and traits which had once been present and had deteriorated.

One may say that potential epileptic children rarely are fearsome or cowardly, and practically never given

to self pity or undue attention to aches and pains. At least none of our series showed these traits, and they are often singularly wanting, as we know, in the epileptic character after years of seizures and great mental deterioration. It is difficult to account for: supersensitive as they often are, it seems to limit its application for the most part to the welfare, preservation and dominance of the ego as such, and not to bodily attachments, as in the psychoneurotic.

In considering social adaptability, we find marked and constant traits. As a rule they had no real intimate friends nor did they strive to become popular in the ordinary sense where subordination of self was required. In many individuals whose epileptic attacks appeared far along in life this lack of sociability not only persisted, but the little such persons once possessed was often lost years before actual seizures occurred. Although many belonged to large families they were singularly solitary, even in their own home. In the casual sense, however, a third were "easy to get acquainted with." A very few children were even "well liked," but even here, as they grew up they most frequently did not further expand this social trait, or it diminished and was altogether lacking before adolescence was finished. The little social tendency a number manifested was for the most part shown in "getting along best with those either older or younger than themselves," and the statement is often made relative to their childhood that "grown folks were very fond of him." The potential epileptic youth is little concerned with how much is made of him, particularly by his elders, where his own complex of the parental attachment is often vicariously recreated; but here again his own loyalty, sacrifice, and tenderness must not be requisitioned, or such attachments were readily broken.

The potential epileptic child got on better alone as compared with others in the same family. As a whole they were born solitary rather than gregarious, in sharp contrast to the feeble-minded. They rather enjoyed being by themselves and engaging in such pastimes as reading or taking solitary walks, and had a feeling of being "sufficient to themselves."

The majority were not bashful or ill at ease with strangers. About two thirds were openly selfish and penurious, and rarely gave up anything they really wanted, though they had little sense of the value of money even in adult life, and this was particularly noted when their own advantage or comfort called for an expenditure. As a rule their egotism was so gross that they showed little tact and were quite unable to handle delicate situations diplomatically. They could cooperate with others if they were keenly interested and could be leaders. They not only wanted their own way, but usually got it by persistence or assuming a fixed attitude of non-cooperation. They took advice of any sort very poorly. Even the most tactful efforts to train out their stubborn attitudes often made matters worse, hence the let alone treatment was followed by family and friends. All invariably demanded precision and order, and reacted irritably whenever their belongings were slightly disarranged. The majority were committed to routine and were classed as rigid in adaptation for years before the psychosis developed.

As a class they saw slights when none were intended, were touchy, and carried grudges for a long time: they were almost invariably resentful, jealous and envious, and easily offended. Not only did they believe the world treated them poorly, but in the majority of cases they were dissatisfied with their environment. The real attitude of the epileptic youth, ever longing for 'something better,' is shown in a statement by one of them: "Sometimes when I have planned to stay at home, after awhile I begin to think, 'Now, if I had gone out I might have had a very good time, much better than I am having now.' I am always looking for something more satisfying than I have."

As regards their power of adaptability to environment, they may be said to enjoy the free and easy atmosphere of visiting country relations, going to an indulgent grandmother's, etc., but, given a rigid discipline and exact rules of conduct, these youths and adolescents not only do poorly, but their first attacks are often produced in no small degree by such long continued demands. One young girl volunteered the characteristic statement, "I can adapt myself readily to new environments if the people are all congenial and I can find enough to interest me." Another seemed to adapt himself rather easily to new situations, but speedily "grew tired and wanted frequent changes."

As a rule these children either had very few inner views of life or very indefinite mental attitudes, and failed to outwardly express them. Some were said to be "very secretive," while others "never talked over their affairs," or had "rather superficial views about life in general," while one stated that she "never spoke of her real inner life to anyone, nor even about the more vital issues of life itself."

From the foregoing one may conclude that the potential epileptic not only is not frank and open, but has no very deep desire to unburden his soul to anyone. He seems to have no rich emotional feelings to impart, which is again in striking contrast to the psychoneurotic makeup.

We find the potential epileptic youth has a matter-of-factness of mind, absolutely devoid of all the vague imaginings often seen in the psychoneurotic. Only when he failed to get satisfaction out of his poor adaptations to life demands did he grow lethargic and prone to day dreaming, but, even then, his phantasy was concerned with his personal aggrandizement and satisfactions. The potential epileptic youth uses the phantasy habit just in proportion as he fails to be interested in or to derive satisfaction from his environment. He rarely possesses sound constructive imagination. For instance, one youth thoughtless that he is heir to his father's large estate and all the employees take their orders from him: another, that he is manager of his father's department store, directed his plans in the line of the parental business, with the father's away, plans improvements and innovations which most frequently prove to be impracticable and ill thought out.

While the extreme variability of mood in the frank epileptic is well known, one finds in our material of the psychoneurotic that the mood of the whole is not an all-or-none, and phase reaction

after the attacks have appeared. Usually these youths are cheerful, but have periods of extreme dejection, shortlived, it is true, but intense while they last. Not a few cases would suffer depression so deep as to make them physically ill; they even felt nauseated and had vomiting attacks, and occasionally an apparent psychogenic fever accompanied by mild delirium. However brief these episodes were, the extreme lability of mood was evidenced by the wide swing of feelings. While the causes for the change of mood to the outsider often appeared most trivial, to these sensitive children provocation loomed "mountain high." A common exterior of overseriousness, strained intentness of expression, or even dejection, was often met on inquiry by the youth's statement that he was quite happy, and was only preoccupied, but not with unpleasant thoughts.

Their manner of taking bereavements was rather that of the stoic. One girl very closely attached to the mother all her preepileptic life and after, said of her father's death which occurred when she was twenty-five years old, "I took it very quietly; it was best so." Another boy deeply attached to his grandfather, was only a little sad for a day or two at his death, but quickly got over it, and spoke of it thereafter "in the most matter-of-fact manner." As might be expected, if the epileptic is not able to love deeply, the bereavement would necessarily be slight, and in no case was the death of a near or dear relative even remotely hinted at as the cause of the after developing disease, which commonly enough is the alleged cause to be met in the psychoneuroses and psychoses.

So far as religion was concerned, not a single case embraced it other than in a superficial, pietistic, or perfunctory manner. However, a hypercritical attitude was usually left for the epileptic career of later life. The influence of epileptics in giving us some of the world religions, such as Shakerism by Mother Ann Lee, Mormonism by Joseph Smith, and Mohammedanism by Mohammed, would be interesting, but the subject is quite apart from the purpose of this paper.

Almost without exception sufficient data was obtained that the potential epileptic characteristics were to be found in one or both ascendants. As well recognized, traits and tendencies, and not disease entities, are inheritable qualities, but the presence of frank epilepsy in the ascendants has no fancied meaning when present; it exists as a definite manifestation of the inheritable traits as shown in the actual disease entity, the traits playing a prominent role. The makeup most likely exists as a recessive and not a dominant character or unit. This view is further emphasized in the essential emotional poverty disclosed both in the infant and the defects of development of the character in later life.

The great majority of the individuals under study never fully developed their emotional life beyond the stage of puberty. It was relatively uncommon to find them engrossed in prostitution as a continued desire; the whole sexual life was most perfunctory and more of a masturbatic character than otherwise, and this held true even when married. No doubt

their natural fixation of development at this level caused the majority to battle unsuccessfully with this habit. We know the majority are most frequently concerned with this "sin" and its "expiation." Such personal conflicts have naturally caused not a few laymen as well as physicians of the past, to ascribe the epileptic disorder to this practice. While of course it may materially hasten the occurrence of their frank epilepsy and invariably make worse an already existent one, the fault to be connected with the disease is much more fundamental. Neither in this series nor elsewhere have we encountered the full possession of a deep love motive, with its rich self subordination, sacrifice and tenderness. As a group the series was little at ease with the opposite sex, had few love affairs and most frequently there were none. Those who married were ludicrously incompetent to meet this adult level and the marital attitude was that of being dissatisfied, irritable, indifferent, and domineering. There was not only no desire for children, but, when they were born, their care was apt to devolve upon the sound mate.

There were little or no idiosyncrasies regarding foods and odors as such, but not a few children had tantrums if food was not prepared "just so." They seemed more concerned in the mechanisms of the service than natural repugnance for the foods themselves, in sharp contrast to the attitude of the psychoneurotic child.

Contrary to what might be expected, there was little or no tendency to cruelty, plaguing or tantalizing, as expressed toward animals. Undoubtedly the character contains little of what one might call anti-social or criminalistic tendencies, although the association of these traits in not a few social offenders shows that the two may coexist in the one individual, perhaps oftener than mere coincidence, but our material naturally was limited to those who had no great or enduring antisocial traits.

The types of interests shown were diverse; on the whole they were in the narrow range of normal youths; that is to say, the interests chosen were relatively few and of a simple concrete character. None seemed to have a sustained or continuous trend in any one direction, none strove to perfect themselves thoroughly in any one ambitious desire. They all seemed incapable of prolonged effort, owing to extra fatigue, diminished interest, or to the extra attention and concentration not taken into account from the start. A tenacity of purpose and steady application seemed impossible. Their "verbal" or "thought" ambitions were boundless, but work without plenty of emotional enthusiasms, lavish praise, and constant change—all essentially infantile in motive—was ill performed.

Exclusive of the infantile period, the potential epileptic children slept soundly though often restlessly, frequently talked, but seldom walked in their sleep. Night terrors were infrequent. Few had bed wetting aside from the latent period of *grand mal* attacks when the epilepsy had really begun.

In conclusion, one may say from this clinical study that the pronounced makeup of the frank epileptic can be easily detected from birth, in many if not all such individuals, years before their dis-

order is diagnosed. While the defect in instincts necessarily varies from the classic type to those having very little of the character, yet some marked traits can probably be found in every case of essential epilepsy. The diagnostic, prognostic, and therapeutic importance of such findings may be briefly stated. No case of essential epilepsy should be diagnosed as such without due attention to the presence of some of the salient characteristics enumerated. Whenever the makeup is thoroughly and firmly fixed and incapable of adaptation to work and social demands commensurate with the life level suitable to the individual's needs and capacity, then a poor prognosis must invariably follow. The maximum attention must be paid to training out or modifying the character faults which will permit the individual epileptic to fully objectivate his supernormal egotism so that, if he may not fully arrest his disorder, at least he may forestall or delay mental deterioration, and thus make his life as normal and happy as possible for the good of all concerned.

The following questionnaire for history taking is a modification of the Hoch-Amsden descriptive guide to the personality. It is made so as to bring out the main facts upon which one may base an estimate of the degree and kind of epileptic character present. The essential faults to be brought out are the egocentricity, sensitiveness, and the emotional poverty of the epileptic character. It is intended to produce both the defective primary endowment as well as the usual deterioration of mental habits once present, but often found already on their way to disintegration before the epileptic attacks themselves occur. As is well known, a rich and well rounded intellectual development depends in no small degree upon the proper development of the emotional life at the same time. Oftentimes the epileptic's intellect is but little or not at all impaired before his attacks occur, and only then becomes so when his interest in environment fails. Hence the primary fault in the epileptic makeup is essentially of the instincts which concern his emotional reactions to his social environment, rather than his intellectual faculties per se. The guide which follows is only a supplement, yet should still be used as such to the Hoch-Amsden scheme until further light and data upon the subject is forthcoming.

CHILDHOOD COVERING INFANCY

Was he a crying baby?
Did he show other nervous or irritable characteristics?
Did he adjust himself fairly comfortably to the bath?
Did he feed well to sleep? Did he cry when he awoke?
Were there "bad nights" in that he woke up and wanted to be nursed frequently?
Did he wake up crying?
Was he easily startled by light or sound?
Was he excitable? Hypersensitive? Insistent upon care and attention, and reluctant to give up these infant demands as he became older?

SCHOOL LIFE

Was his education one-sided and irregular in development?
Was his education not up to his opportunities?
Was he unable to concentrate and give proper attention to his studies?
Was he unable to take the full schedule at school, or was he tutored for short periods only?

Did he find school discipline and routine intolerable and irksome?
Did he learn poorly and make poor progress?
Was he ever left back in classes?
Did he show a lack of interest in studies—beginning at what grade?
When unable to adapt to school routine did he react with any of the following symptoms: Face pale? Eyes dilated? Lethargic? Sullen? Yawn frequently?
Did he observe well as a child?
Was he practical?
Was he capable in positions?
Did he have good common sense?
Could he use tools well?

In childhood was he lively, active at work or play,—a tendency to overactivity?
Was he excitable in play, either by himself or with others?
Did he play freely with other children?
Was he inclined to lead?
Did he show much demand for self assertion?
Was he courageous?
Did he care little for athletics, sports, team play?
Did he enjoy reading? Solitary walks?
In his play what did he prefer? Did he show little imagination in it?
Was he rather inclined to be silent?
Was he energetic?
Was he active or overactive by fits and starts?
Did he spend his energies sensibly or in a desultory way?

Was he self reliant?
Was there a feeling of superiority rather than inferiority?
Did he show little concern as to the opinions which others might have of him?
Was he conceited, egotistic,—given to self admiration?
Was he vain, proud?
Did he pay attention to his dress?
Did he emphasize his dislike for sham?
Did he blame others for his faults?
Did he pay little attention to aches and pains?

Had he a tendency to be unsocial, to hold himself aloof?
Did he prefer to be alone?
Was he at ease with strangers?
Was there little tendency to bashfulness?
Was he selfish, or sympathetic, kindhearted, altruistic?
Had he a genuine respect for the rights of others?
Was he penurious?
Was he quarrelsome?
Was he untactful?
Did he show poor ability to cooperate with others?
Did he want his own way, often gaining it by a fixed attitude of noncooperation?
Was he disobedient when a child?
Did he take advice well or did he always think he was in the right?
Was he stubborn,—set in his opinions?
Did he dislike his mistakes to be pointed out?
Was he trustful or suspicious?
Was he resentful, held grudges long?
Was he easily offended?
Did he see slights when none were intended?
Was he jealous or envious?
Did he think the world treated him ill?
Had he an exaggerated sense of pride in self and family?
Did he feel satisfied with his environment, or did he feel above it?
Did he adapt himself badly to new environments (i. e. being away from home, moving to new places, etc.)?
Were his interests relatively few, of a simple, concrete character?
Was but little known of his inner life, his views, his mental attitudes?
Were his views rather superficial of life in general?
Was he uninclined to be frank and open?

Was there little tendency to unburden himself to other people, or special people?

Was he inclined to be reticent?

Was he conscientious,—had he a natural feeling of responsibility; or was he unusually scrupulous?

Was he committed to a routine?

Was he finicky in his demands for precision, system and order?

Did he make an abnormal demand for truthfulness and justice?

Did he get along best with those either younger or older than himself, rather than those of his own age?

Did he show little ability to be free and agile mentally,—rather rigid?

ATTITUDE TOWARD REALITY.

Did he take things as they were, or rather as he wanted them to be?

Was he phantastic and over imaginative?

Was he inclined to build air castles? Did he derive much satisfaction from it?

Was he truthful?

Were his "ambitions" boundless, with little capacity to seriously strive toward a definite goal?

MOOD.

Was he argumentative, restless, quarrelsome?

Was there an underlying supersensitiveness?

Were there periods of being lethargic and indifferent?

Was he rather vague and irresolute of purpose?

Were there short periods of dejection, quietude, etc.?

Was he inclined to take things seriously?

Was he optimistic,—hopeful?

Did he react to pleasure, good news, etc., quietly, with little outward elation?

Had he a tendency to look on the dark side and brood?

Did he get despondent without apparent reason?

Did he react to bereavement in the manner of a stoic?

Did he crave little sympathy in his depressions?

Had he a tendency to anxiousness,—to forebodings?

Was he irritable, quick tempered?

Did the irritation last long?

Did he have tantrums when a child?

Was he sensitive and touchy?

Was he fault finding?

Was his attitude toward religion perfunctory, superficial?

FRIENDSHIPS, ETC.

Was he undemonstrative?

Did he make few friends?

Did he give up his friends on slight provocation?

Did he show a preference toward the mother?

Were there any antagonisms in the family?

Was he ill at ease with the opposite sex?

Did he have few love affairs, rather of a perfunctory type?

In marriage relations, was he irritable, domineering; little desire for children?

ANTECEDENTS.

Were high, volatile tempers shown on either side of the family stock, or to be found in either parent?

128 EAST SIXTY-FIRST STREET.

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The Treatment of Gastric and Duodenal Ulcer.

--C. E. Bowers and W. P. Callahan (*The South-west Journal of Medicine and Surgery*, February, 1918) think that all cases should be treated medically at first, but, if they do not improve in a reasonable time, surgery should be resorted to. No case of pyloric or duodenal ulcer should be allowed to reach the stage of obstruction before operation is performed. In analyzing the results of surgical treatment it is shown that sixty per cent. to seventy per cent. are absolutely cured or greatly benefited and that the average mortality, based on the figures of the best hospitals, is about 7.5 per cent.

THE RELATION OF CARBOHYDRATES TO PROTEIN SYNTHESIS.

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INTRODUCTION.

The prevailing view of protein formation is a simple conception. Food proteins are held to undergo digestion with decomposition into aminoacids which are taken up by the tissues and linked together to synthetically repair or replace protoplasm. Though it is accepted that under unusual circumstances, such as in starvation, other body proteins may become the source of this aminoacid supply, the albuminous substances of the food are generally regarded as the sole considerable source of new body protein.

However, this belief became widespread at a time when the great synthetic capacity of the animal organism was not fully appreciated. Since then various experiments have been recorded of aminoacid synthesis within the body. Hydroxyacids, ketonic acids and ketoaldehydes are now known to unite with ammonia to yield a number of the aminoacids present in the tissues. As a number of these non-nitrogenous intermediary substances which enter into the formation of aminoacids are either products or closely related to products of carbohydrate metabolism, the possibility evidently exists that protein itself may be formed from carbohydrate metabolites by their union with nitrogen compounds, such as ammonia. If products of carbohydrate metabolism should be found to represent important repair and building materials for protoplasm, this would become a fact of great significance in the study of normal and pathological metabolism. Thus the metabolism of diabetes could be better explained on this basis. This disease is characterized not only by an inability to utilize carbohydrate, but also by disturbances in protein and fat metabolism. If carbohydrate metabolites enter into protein formation, it is readily understandable how in diabetes loss of protein would ensue as a result of the inability to utilize carbohydrate. Again, the effect which the ductless glands exert both upon protein and carbohydrate metabolism can be most reasonably explained and correlated on the basis that products of carbohydrate metabolism can be used synthetically in the formation and repair of the body tissues.

It has therefore been deemed useful to collect and add from various sources data supporting this view of metabolism as well as to call attention to its possible applications. This represents the purpose of the present article. As a matter of convenience the subject has been divided into the following sections: data from carbohydrate and nitrogen metabolism, data from intermediary metabolism, data from muscle metabolism, and general considerations.

DATA FROM CARBOHYDRATE AND NITROGEN METABOLISM.

Previous workers, particularly Kassowitz (1), Paton (2), and Cathcart (3, 4), have supported this view that carbohydrate products enter into the

formation of tissue proteins. It has, however, failed to be appreciated by physiologists for several reasons. The fact that it has in the past been regarded as a somewhat radical departure from recognized theories has contributed to this opinion. Again, no evidence of compelling nature has as yet been advanced in its support. Such arguments may however be criticised. The possibility of protein formation from carbohydrates can in view of our increased modern knowledge of intermediary metabolism no longer be regarded as fanciful or radical. It must also be remembered that it is very difficult to produce absolute proof for any existing theory of metabolism. Thus it is universally accepted that proteins are formed from food aminoacids, but it remains necessary for us to base our belief that this really does take place on such indirect evidence as nitrogen retention experiments and polypeptid synthesis *in vitro*. On the other hand there are a number of facts that remain difficult of explanation without acceptance of the view that carbohydrate metabolites may enter into the formation of protein. The writer has also been unable to discover evidence militating against this metabolic conception. This section is devoted to reviewing known data from studies in carbohydrate and protein metabolism bearing on this article. If metabolites derived from carbohydrate play such an essential part in protoplasmic nutrition, evidence should exist that carbohydrates are more or less indispensable to the organism. Though but indirectly connected with the present theme, existing data of this nature may be briefly mentioned.

Glucose is known to persist in the blood at a high level, and glycogen in the tissues even in advanced starvation. The presence of glycogen depots in the regions of greatest metabolic activity—liver, heart (5), somatic muscles, and uterus before menstruation (6)—emphasizes the important part played by carbohydrate in the maintenance of the tissues. The resistance of the dog's liver to chloroform necrosis has been shown to bear a direct relation to the amount of glycogen present in this organ (7), the toxic effect on the liver cells being less marked when considerable glycogen was at hand.

The indispensability of carbohydrates to the tissue proteins is also well demonstrated by Kaufmann's work (8). This author found that fasting rabbits die in three or four days' time. Administration of oil does not prevent this exitus which is accompanied by a rise in the nitrogen elimination. When sugar was administered, not only did the animals survive a much longer period, but the nitrogen output constantly decreased. From this work it is evident that factors other than the mere presence of fuel substances influence the fate of these rabbits, also that carbohydrates are essential in delaying death from undernutrition.

In feeding experiments it is well known that more weight is gained and nitrogen retained on a mixed diet containing abundant quantities of carbohydrate than on either a high protein fat or carbohydrate diet. This would indicate that carbohydrate and nitrogenous food taken together represent the ideal material for protein formation. The objection may be raised that animals have not only survived over a long period of time on an exclusive

protein diet, but nitrogen has been retained under these circumstances. Carbohydrate would seem not indispensable in this case. It is known, however, that glucose and glycogen may be formed from ingested protein (9, 10). Therefore, this criticism loses its force, as the need for carbohydrate could be supplied in this way. There is also evidence that a certain amount of carbohydrate is necessary for nitrogen retention, i. e., tissue formation to take place on a fat protein diet. Very recently Umeda (11) working in Cathcart's laboratory has shown that nitrogen added as protein to a carbohydrate diet is retained in greater amount than when added to a fat diet of equal caloric value.

The well known sparing action of carbohydrate on protein breakdown can best be accounted for with the help of the view that carbohydrates actually take part in protein synthesis. This follows from the important experiments of Landergren (12) confirmed by Cedercreutz (13) and Cathcart (3, 4). It was shown that the minimal nitrogen excretion during a protracted fast could be still further decreased by a carbohydrate diet, whereas the replacement of this diet by one consisting of isodynamic quantities of fat was followed by a rise in the nitrogen excretion. The conclusions which may be drawn from this work are as follows. The organism stands in such need of carbohydrates or metabolic products derived from carbohydrates that during a fast even its own protein is further sacrificed, so that this food substance can be provided for the tissues. The extra breakdown of protein ceases when carbohydrates are ingested. From this it is also apparent that the needed material can be supplied either by carbohydrates or proteins and must therefore consist of metabolic products which are common to both protein and carbohydrate metabolism. It is evident that some of these products must be of nonnitrogenous nature. Moreover, this phenomenon is not to be accounted for on dynamic grounds for it was shown that the same number of calories introduced in the form of fat fails to spare the body proteins in like manner.

As Landergren remarks, his experiments present no proof that a formation of carbohydrate from body protein may be required under normal nutritive conditions, i. e., the presence of an abundant amount of other nonnitrogenous or nitrogenous food. Kayser (14) has supplied this lack. In one of this author's experiments the nitrogen excreted amounted to 18.8, 19.3, 20.1 grams per diem on a diet consisting of 11 grams nitrogen, 74 grams fat and 338 grams carbohydrates. When the carbohydrate was replaced by an isodynamic quantity of fat the nitrogen output rose to 22.2, 22.9 and 25.4 grams daily to return to 20.8, 18.4 and 18.8 grams when the fat was replaced by carbohydrate in the amounts ingested in the first period. The conclusion which can be drawn from this work is twofold: Carbohydrates are necessary for retention of nitrogen, therefore presumably protein synthesis; second, carbohydrates are so urgently required by the organism that an increased amount of body protein is broken down to supply them, when they are omitted from a diet which even contains both protein and fat in plenty. It seems then likely that

carbohydrates supply something essential for the repair and synthesis of body protein. The above experiments have not gone unchallenged. Murlin (15) found that the protein sparing of gelatin was greater than that of an amount of glucose representing sixty per cent. of the weight of the protein ingested. Sixty per cent. of gelatin is known to be converted into glucose in diabetic metabolism. From this evidence Murlin and Lusk (16) concluded that the "sparing" action of gelatin was due to its specific chemical structure and not to the glucose which can be formed from it in metabolism. Lusk on this ground held that the rise of nitrogen metabolism observed by Landergren after the substitution of a fat for carbohydrate diet could not be due to the absolute requirement of the organism for carbohydrate.

Various objections can be made to the latter interpretation. Murlin's experiments merely demonstrated that under the conditions maintained, the sparing action of gelatine was greater in a normal fasting canine than that of the amount of glucose capable of being formed from this protein in diabetic metabolism, not that glucose is not indispensable to the organism. In these experiments, a minimal amount of nitrogen equivalent to one third of the normal fasting output was fed on the carbohydrate days. It is therefore likely that the increase in the nitrogen elimination observed on these days is a result of "specific nitrogen hunger," i. e., a demand on the part of the organism for products which can only be supplied by certain protein constituents. An increased protein breakdown resulted. The amount of glucose here given was twenty-four grams for a man of forty-five kilograms. The sparing effect of this small amount of glucose on protoplasm was therefore probably entirely overshadowed by the increased protein breakdown for the reason stated above. This seems likely from other of Murlin's experiments where the ingestion of twenty-two grams dextrose by a dog weighing thirteen kilograms resulted in the sparing of but 0.28 gram nitrogen. These results cannot therefore be accepted as affecting the value of Landergren's observation.

Rübner (17) likewise takes exception to Landergren's views and offers a speculative mass action hypothesis in explanation. He states: "Der Unterschied im Eiweissumsatz bei Fett und Kohlehydrate beruht offenbar darin, dass der Zucker und die leicht löslichen Kohlehydrate gründlicher den N-Zerfall aus dynamischen Gründen hindern wie das Fett." Against such a view militate strongly, however, certain important experimental results obtained by Ringer (18) in his studies on phlorrhizin glycosuria. This worker demonstrated that 31.8 grams protein could be spared by 5.5 grams carbohydrate and properly called attention to the fact that more protein escaped breakdown owing to the action of the glucose than could be accounted for on dynamic grounds. It is evident that a purely dynamic hypothesis inadequately accounts for the facts.

Caspari (19) has also attacked Landergren's work from another angle. The former points out that it is improper to accept, as did the Scandina-

vian worker, that fats are incapable of forming carbohydrates in metabolism, for glycerin, a fat component, is held to have this action in the body. It would be difficult then to understand, if carbohydrate in considerable amount is formed from fat in this manner, why protein should be sacrificed to obtain carbohydrate when the subject is on a diet of fats. In further support of such reasoning it may be mentioned that Ringer's more recent researches have shown that a large number of fatty acids are glucogenic. In explanation it may be said that there is indeed no longer doubt of carbohydrate formation from compounds of fat, and that in this way protein sparing could possibly be effected. On the other hand, it is indisputably demonstrated that fats are much less efficacious than are carbohydrates in protein sparing, which is greatly enhanced by the addition of a certain amount of carbohydrate to a fat diet. Much evidence has accumulated that carbohydrate formation from fats fed as such is little or none. These facts make it evident that Caspari's ground for criticism of the Landergren experiments possesses no very certain basis. Several other hypotheses also offered by Caspari in explanation of Landergren's results are not susceptible of rigorous critical analysis.

In summarizing then it may be said no criticism annulling the value of Landergren's observations has ever been advanced. This worker's own interpretation remains the only one adequately accounting for the facts. This data may therefore be accepted as important evidence in support of the theory of protein synthesis from carbohydrate metabolites.

If, as the Landergren, Cathcart and Cedererentz experiments indicate, carbohydrates supply products indispensable for protein repair and synthesis, the metabolic products of carbohydrates should in like manner be found to spare protein on being introduced into the organism. Very recently Kocher (20) has supplied such evidence. He clearly demonstrated that l-lactic acid when fed to dogs possessed the power to spare about as much protein as does glucose itself. Pyruvic acid, another glucose metabolite, was also shown to have this same action in less degree. The important rôle played by such substances in aminoacid formation will be discussed later. The chief point to be emphasized at present is that these experiments make it very probable that protein repair and synthesis may be carried out by the intermediary products of carbohydrate metabolism. A further example of protein sparing is afforded by Ringer and Frankel's (21) experiments in which acetaldehyde and propylaldehyde were fed phlorrhizinized dogs. The effects noted were a reduction of the nitrogen output and increase of sugar production. As Sansum and Woodyatt (22) later demonstrated that the glycosuria in this case which was too great to be produced by the amount of aldehyde ingested is most probably to be ascribed to toxic elimination or carbohydrate previously present in the organism, this aspect of these experiments may be disregarded in the present discussion. Their chief importance lies, however, in showing the possibility of such a simple nonnitrogenous substance as acetalde-

hyde, which possesses but two carbon atoms, being synthetically utilized in protein formation and repair.

J. Loeb (23) has recently reported data which may prove to be of considerable importance in its relation to the present subject. Five normal generations of insect, the banana fly, could be raised on nutriment consisting solely of sugars, ammonium tartrate, citric acid, inorganic salts, and water. This seems rather convincing proof that the various proteins of a complex animal organism can be synthesized from such substances. Such experiments are, however, only absolutely convincing when accompanied by proof that they took place under sterile conditions which were not maintained with certainty in Loeb's experiments. Only in this way could be excluded the possibility of the necessary synthetic processes taking place with the help of bacteria. Even, however, should this prove to be the case, it still must be admitted that the building up of protoplasm from such simple substances is a function of the living cell.

We may now consider the possibility of simple nitrogenous substances being utilized in protein synthesis in the manner described above. Ammonia and urea are constantly set free in the catabolism of aminoacids of the food (24). Urea is readily taken up into the tissues out of the blood. Ammonia salts rapidly disappear from blood into the organs (25). Ammonia certainly enters into the synthesis of aminoacids in the organism (see next section). Ammonia is converted into amide nitrogen in the liver and muscle (26). There is considerable indication that the nitrogen arising in the breakdown of muscle tissues during work is synthetically retained (2). The fact that only small amounts of urea and ammonia are detectable by analysis in the tissues does not militate against acceptance of the view that very considerable quantities of ammonia may be split off in intermediary metabolism and immediately enter into new combinations. Evidently the possibility of synthetic utilization of simple nitrogen compounds within the body exists.

Evidence obtained from nitrogen retention experiments may with this prefix now be alluded to. Among others, Aberhalden, Grafe, and their co-workers in numerous experiments, also Taylor and Ringer (27), have demonstrated a retention of nitrogen to occur after ingestion of various simple nitrogenous compounds, such as ammonium salts. Grafe has shown that more nitrogen is retained when carbohydrates are added to such a diet. It may therefore be assumed that protein repair or synthesis has been thus shown to take place from carbohydrate material and nitrogen even in non-organic combination. Unfortunately the value of such data is open to question. The retention of nitrogen by the body represents no compelling proof that this material has actually entered into protein formation. Various nitrogenous substances including even aminoacids (28) may, however, be absorbed by the tissues without at least entering into immediate union with protein. On the other hand extensive protein synthesis without retention of nitrogen is inconceivable. Moreover the increased retention of nitrogen due to the addition of carbo-

hydrate to the diet cannot be very adequately accounted for by increased storage of nitrogen in the form of muscle extractives. The nonprotein nitrogen of muscle proteins represents also but a fairly small fraction, about thirteen per cent., of the total nitrogen contained in muscle. On these grounds it is believed that a definitely positive nitrogen balance in feeding experiments may be accepted as indicating that at least part of the retained nitrogen has entered into the repair or synthesis of protein.

Taylor and Ringer found that nitrogen was retained even in completely phlorhizinized dogs and accept this as evidence that carbohydrates are not essential for protein synthesis in spite of the fact that the weight of experimental evidence is greatly in favor of this view. It has however been made clear that it is not carbohydrate *per se* which represents the necessary material, but rather certain metabolic products common both to carbohydrate and protein metabolism. This is evident from Landergren's and Cathcart's experiments described above. Increased protein breakdown is characteristic of phlorhizin diabetes. This may be in part due to the necessity of a supply of this essential material for protein synthesis, a process so fundamental that it must continue even at the sacrifice of living protoplasm. Accepting the retention of nitrogen in Taylor's and Ringer's experiments to be due to protein regeneration, it is believed that the essential nonnitrogenous metabolic products also necessary for synthesis were obtained from sources other than glucose appearing in the urine. Breakdown of the animal's protein may have supplied such material in this case. The failure of the glucose metabolism to be influenced may thus be accounted for. There are also increasing indications that even in complete diabetes a certain amount of glucose is utilized within the body. Other of Ringer's experiments (18) demonstrate moreover that large amounts of glucose lead to protein sparing in phlorhizin diabetes; also that this protein sparing is accompanied by disappearance of glucose. This data stands in direct contradiction to the view of Taylor and Ringer that carbohydrate is not essential for protein sparing in this form of diabetes. This interesting subject cannot be further discussed here.

If protein synthesis takes place from the products of carbohydrate metabolism and nitrogenous substances, one may look to urinary analyses with nitrogen partitions for additional confirmatory data. Thus if the ingestion of carbohydrates removes through synthesis ammonia compounds, ammonia and urea might be expected to be found in diminished quantity in the urine if such reactions occur when carbohydrates are ingested. A diet of fats on the other hand, should not be found to exert such a marked influence. The following experiment by Cathcart (3) represents such data. This author has not however applied it so specifically to the theory of protein synthesis under discussion.

The human subject on a purely carbohydrate diet is seen not to excrete as much total nitrogen as during the second day of administration of isodynamic amounts of fat. Increased amounts of ammonia and urea nitrogen in relation to the total amount of nitrogen were observed on the second day. The

rise in excretion of nitrogenous substances on the fat diet cannot however be accounted for on the basis that an increased amount of ammonia appeared in the urine because such a quantity was necessary for the neutralization of fatty acids. If this were true the extra ammonia for this purpose would be supplied at the expense of the urea as observed in acidosis experiments. In this experiment, however, an increased amount of urea nitrogen during the fat period was eliminated. Indeed this increase was considerably greater than the extra amount of ammonia nitrogen excreted during the fat days.

CATHCART'S EXPERIMENTS (TABLE V).

Day of Experiment	Nitrogen in grams					Per cent. of total nitrogen					Diet
	Total	Urea	Ammonia	Uric acid	Creatinine	Total	Urea	Ammonia	Uric acid	Creatinine	
3	4.77	3.21	.132	.146	.413	.007	67.2	2.7	3.1	8.65	.15
4	4.79	3.17	.121	.152	.450	.004	66.2	2.5	3.1	9.37	.08
5	4.39	3.31	.104	.125	.436	.000	75.3	2.3	2.8	9.93	.00
6	4.83	3.76	.238	.157	.400	.019	77.8	4.9	3.2	8.28	.39
7	8.13	6.04	.527	.088	.347	.091	81.6	6.4	1.1	4.26	1.12

In the experiments by Ringer and Frankel, which have been already cited, the ingestion of acetaldehyde and propylaldehydes caused a marked retention of total nitrogen; therefore, of urea nitrogen. This was accompanied by a decided indication of decreased precentile ammonia nitrogen output. In view of other evidence already presented these and Cathcart's experiment just described may also be regarded as indicative of utilization of ammonia compounds in protein regeneration coincidentally with that of glucose or lower aldehydes.

The results obtained from performing urinary nitrogen partitions on fasting animals to which sugar is fed are definite. The following is one of a number of protocols of such experiments carried out in the writer's laboratory.

THE EFFECT OF GLUCOSE ON THE NITROGEN PARTITION										
Day	Total gm.	Urea gm.	%	NH ₃ gm.	%	Purine gm.	%	Creatinine N.	Creatinine N.	
1	3.03	2.27	74	0.21	7	.021	0.7	0.21	6.9	0.026
2	3.11	2.44	78	0.23	7	.012	0.4	0.22	7.0	0.038
3	3.12	1.83	58	0.30	9	.030	1.0	0.21	7.3	0.016
4	2.47	1.71	69	0.24	9	.026	0.7	0.18	7.2	0.038
5	2.55	1.70	67	0.24	9	.020	0.8	0.18	7.0	0.038
6	3.14	2.51	80	0.21	8	.020	0.6	0.20	6.3	0.022

Remarks.—Fasting experiment. Weight of dog, 17.6 kgm. Water, 40 cc. per kgm. body weight throughout. On day 3, 4, and 5, 15 gms. glucose per kgm. given. No glucose in urine except on day 3, when 2.4 gm. were found.

It is seen that the action of glucose on nitrogenous metabolism is limited to its effect on the urea excretion. A lowering of the amount of ammonia in the urine of the sugar days was not present in our observations. The creatine and purin nitrogen undergo, however, no corresponding decrease, but remain stationary. As urea is formed from ammonia compounds the failure of the ammonia nitrogen to undergo reduction may possibly thus be accounted for. The protein sparing phenomenon cannot therefore be ascribed merely to the retention of water in the organism and to a decrease in the excretion of the nitrogenous constituents of the urine due to oliguria. In these experiments an absolute and relative diminution of urea excretion on the sugar days is characteristic. It may therefore be inferred that a certain amount of

ammonia compounds usually utilized as urea was synthetically removed in protein repair and synthesis and thus escaped excretion.

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(To be concluded.)

THE CLINICAL SIGNIFICANCE OF A FECAL ANALYSIS.

Second Communication.

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Macroscopical study of the bowel excrement does not often reveal anything that would suggest pathological inferences. Under these circumstances chemical, microscopical, and bacteriological investigations may serve a useful purpose. These methods are also used for the purpose of confirming an already acquired knowledge based upon the results of macroscopical observation. In a recent paper (1), gross examination of the stool was discussed and from it we can readily appreciate the importance of the examination with which this paper is concerned.

In the first paper we considered the gross anatomy of the stool, while here the minute anatomy and histological structure will be our concern. Fecology, as it may be termed, is as yet a rather recent study and has only within the last decade impressed the medical world of its value in the study of alimentary disturbances. It may yet be some time before it is as complete as studies of the blood, urine, and other body fluids. The sooner, however, we accomplish this, the more successful will we undoubtedly be in handling cases of vague symptomatology, particularly cases of diseases affecting the abdominovisceral organs or ailments of a metabolic or so called idiopathic nature.

Let us first consider the microscopical examination of the feces which, as has already been stated,

will either confirm or complete our macroscopic studies. The microscope method brings into direct magnified ocular range the constituents which we were unable to recognize with the naked eye. Three preparations of the stool should be made upon a slide mounted with a cover slip.

Microscopic preparation.—The first step is to stir up well a mixture of a small portion of feces with distilled water. This mixture should not be too thick lest it interfere with microscopic observation. After the fecal mixture has been prepared, a large drop of it is mounted with cover slip upon a slide and examined with the high and low powers of the microscope. This specimen is known as the native specimen because it is not obscured by any unnatural colors and presents its constituents in their natural form. Another specimen should be stained with a drop or more of Lugol's solution and a third specimen should be studied after staining with Sudan III. The second and third specimens are studied respectively for starch and fat contents. At times the fat content can be stained with osmic acid instead of Sudan III. Occasionally a drop or more of thirty per cent. acetic acid is added to a preparation of fecal extract on a slide and the entire specimen boiled. Upon cooling, the entire fat content will show in the form of fatty acid flakes. The Lugol solution specimen will show starch, when present in the stool, as blue or violet stained particles. At times fungus spores will exhibit this similar stain. Sudan III will color the neutral fats red or pink. The fatty acids will also stain reddish. Osmic acid colors neutral fat black.

Normal constituents.—Normally, after a test diet, a homogeneous mass appears consisting of detritus composed of granular and globular solid material and bacteria. At times larger bodies consisting of isolated muscle remains with rounded ends and indistinct striations, if any, are seen; also small and large yellow, salts of calcium, colorless soaps, isolated potato remains, chaffy remains from oatmeal gruel, and cocoa remains. These are the only constituents that we expect to find in a normal stool following a test diet.

Connective tissue remains.—The presence in the stool of sharply cut off and well striated muscle fibres would, as a rule, speak for pathogenicity of intestinal function, but before we can draw definite conclusions, we must take a more general view of the entire fecal status, i. e., we must look for other elements with which the muscle fibres are commonly associated and which through their presence may lead us to altogether different deductions. If along with the muscle remains a large quantity of connective tissue remains are found, we may immediately suspect probable disturbance with the gastric apparatus. In such an event it must be ascertained whether or not the trouble is entirely gastric or also associated with pancreatic or intestinal malfunction. The gastric juice alone is the secretion capable of dissolving connective tissue and we may therefore assume that the presence of connective tissue in the stool implies gastric disturbance of either a functional or organic nature. Corresponding to pure functional gastric disturbance there may be gastric secretory depression in the form of inadequate or absent HCl, pepsin, and rennin, gastric hy-

perperistalsis, or gastric hypermotility. These disturbances may occur separately or together. Improper digestion of connective tissue would result from such disturbances, in the first instances, because of a lack of proper digestive ferments or medium necessary for ferment action, and in the latter instances because the food has been forced or rushed through the stomach without having been exposed to the gastric secretion for a sufficient length of time. These same disturbances may occur in consequence of an organic lesion in the stomach proper or from irritation of another source as in achylia, gastritis, gastric malignancy, appendicitis, gallbladder diseases, thyroid disease, etc. It has been taken for granted by many that the stomach has slight erptic power and some (2) even contend that this power is augmented in gastric cancer but the consensus confines this function to the intestinal tract.

Muscle remains.—If undigested muscle remains are found in the stool and their presence can not be ascribed to the improper digestion of the connective tissue elements which surround each muscle fibre and which would thus interfere with the proper digestion of the muscle itself, then we are constrained to attribute their presence to disturbance in the intestinal tract. The first deduction is disturbed tryptic digestion. Disturbed tryptic digestion may result from inadequate secretion of pancreatic juice, due to functional or organic disease in the pancreas, intestine, or both. It is also possible that apparent muscle indigestion may be due to a hyperperistalsis or hypermotility of the small intestine in which the muscle tissue foods hasten through the bowel without having undergone digestion. Before considering the subject of inadequate pancreatic secretion, it might be wise to mention that an incapable pancreatic secretion, due to a lack of intestinal secretion or intestinal enterokinase, may exist. Some authorities state that the pancreatic secretion consists of two distinct components: 1, a nervous secretion produced by the secretory fibres of the vagus and sympathetic systems, and, 2, a chemical secretion resulting from the action of secretin. Pawlow believes that the duodenum secretes a substance capable of activating the tryptic ferment of the pancreatic juice and this he calls enterokinase.

According to the foregoing it is plain that disease of the pancreas in the form of a nervous depression of the secretory nerves or the result of organic destruction, as in pancreatitis, tumor, etc., may produce an inadequate pancreatic secretion. The inadequate entrance of pancreatic juice into the intestinal tract may result from obstruction to the pancreatic duct, as in calculus, tumor, pressure from without by tumor, and adhesions. Disease of the duodenum that would interfere with the proper creation of secretin would also necessarily interfere with the secretion of capable pancreatic juice if according to the experimental evidence produced by Bayliss and Starling (3). By similar reasoning, it is possible that disease of the duodenum deprives the pancreatic juice of its activator, enterokinase. The diseases of the duodenum capable of producing these disturbances may have originated primarily in this organ or may have followed other neighboring affections. It is not improbable that duodenal ulcer

with its associated duodenitis or simple duodenitis alone may thus incite tryptic indigestion. In a like manner, duodenitis following diseases of the stomach, liver, and gallbladder may produce intestinal indigestion. It is also held that in conditions where the bile does not enter the intestine in sufficient quantity, the pancreatic juice does not receive the activating influence that is normally contributed to it and as a result muscle digestion may be disturbed. It is also possible that another ferment, erepsin, may be lacking, to a certain extent, in duodenal disease and because of its absence may encourage the presence of muscle remains in the stool. The fact, therefore, is impressive that duodenal disease in itself may for many reasons cause muscle indigestion.

Carbohydrate remains.—Carbohydrate remains in the form of isolated starch cells which, when present in small quantity microscopically, do not necessarily signify disease, but when present in larger amounts would suggest amylolytic disturbance. It is rather difficult to localize definitely the amylolytic disruption, i. e., whether it is in the pancreas or duodenum, but further studies of the stool may help us. If, along with carbohydrate remains, there are fat remains we may conclude that the pancreas mainly is disturbed. Many muscle remains may also suggest this although it is not impossible that the small intestine may also be affected with it. Where the starch cells alone are the food remains that evince improper digestion, we might be inclined to favor only small intestinal malfunction. Further study by examination of duodenal content may clarify matters somewhat. In all likelihood, starch cells alone would indicate functional disturbance of the intestine, whereas if associated with other remains would probably indicate organic afflictions. The ferments that are supposed to complete carbohydrate digestion originally begun in the mouth by the saliva are pancreatic amylase and the ferments maltase, lactase, and invertase of the small intestine. Therefore, as said of muscle remains, it may be said of starch remains that the pancreas and small intestine are probably the organs involved.

Fat remains.—Ordinarily when fat remains exist in the stool, the outward appearance of the feces will suggest it. It does not, as a rule, require microscopical examination to determine its presence. Microscopically, fat will be noted as either neutral fat, fatty acid crystals, or soap needles. Since we know that lipase is a pancreatic ferment, the presence of fat in the stool would indicate that there may be some interference with its secretion or entrance into the intestine. Fat may also appear in the stool as a result of the deficient secretion of bile by the liver or because of an impediment to its entrance into the intestine. In such instances, the fatty food is not entirely disposed of because the bile which usually aids in its digestion and absorption is lacking. Therefore, the presence of fat in the stool, particularly in appreciable amount, would point to many possible disturbances such as pancreatic disease, liver disturbances, cholelithiasis, and tumor of the liver, gallbladder, gall duct, or neighboring organs interfering with the proper passage of bile into the intestine, as well as possible local disease within the intestine to which defective absorption is due.

Mucus.—Mucus is significant and was considered in the first communication. Mucus, when pathological, is present as a rule in sufficient quantity to be noted macroscopically. Microscopical study, however, may assist in a more definite recognition of the origin of the mucus, i. e., whether it comes from the large or small intestine. For instance, small flakes of mucus would suggest origin higher up from the small intestine, whereas large masses would indicate an origin lower down, as in the sigmoid or rectum. The more thickly the mucus is interspersed with round cells, the more probable that it follows inflammation. When pus cells are noted, the greater the likelihood of a purulent inflammation or infection.

Yeast.—Yeast cells, when found microscopically, at once suggest carbohydrate fermentation. In association starch cells will probably be found. No other conclusions may be drawn from its presence than that it denotes a fermentative state. In this condition we are also apt to find fungi or fungus spores. Likewise, fatty acids when found in quantity would imply fat decomposition.

Pus.—Pus cells, as we know, speak for purulent inflammation of some portion of the alimentary tract and if found in rather large quantity indicate disease low down, as in the rectum and sigmoid or in organs connected with the lower tract through fistulae. The same logic would apply to definitely recognizable red blood cells which would spell hemorrhage low down, as in new growth or ulcer of the sigmoid or rectum.

Parasites.—Parasites, ova, parts of worms would, of course, indicate disturbances or disease, as hookworm disease, amebic dysentery, etc.

Occult blood.—A common test to which the stool is subjected is the so called occult blood test. The benzinid or guaiac tests may be employed.

The former, being more delicate, is probably the most reliable and this test should, therefore, only be carried out upon the feces of patients who have avoided meats or any blood containing substance for at least seventy-two hours during which time all foods ingested prior to the induction of this meat free diet have been eliminated per rectum. As already stated, the presence of blood denotes hemorrhage from some portion of the alimentary tract. The more decided the chemical reaction, the more decided probably the hemorrhage. If bleeding from the lower bowel, rectum, or anus can be excluded, then the hemorrhage in all events originates higher up. Very often the hemorrhage that produces occult blood in the stool occurs either in the stomach or duodenum and is due to erosions, ulcer, or new growth. At times the bleeding may arise in the biliary or pancreatic tracts or organs and is led by their respective ducts into the upper bowel. Occasionally the hemorrhagic areas occur lower down, as in ulcerated patches characteristic of typhoid fever, sigmoid ulcer, etc. However, let us bear in mind that common gastric complaints associated with occult fecal bleeding most often signify stomach or duodenal ulcer of mild or pronounced degree.

Urobilin.—The Schmidt sublimate test, in which equal portions of feces and saturated solution of corrosive sublimate (aqueous) are mixed and allowed to stand in a thermostat for one half hour or at room temperature for twenty-four hours, is a

rather important procedure and results normally in the production of a red or pink color which denotes the presence of altered bile. Altered bile, urobilin, is a normal constituent of the feces. When the bile as secreted does not undergo putrefaction or bacterial change, this test will result in the production of a green color. When the stool exhibits no change in color at all while in the presence of this reagent, then bile is considered absent. Another test that denotes the presence of altered bile—urobilinogen—in the stool is performed as follows: To an alcoholic extract of feces, a few drops of prepared solution—*paradimethylaminobenzaldehyde*, 4.0; concentrated *HCl*, 40.0; aqua and a few drops alcohol, 200.0—are added. A reddish color indicates the presence of urobilinogen. A negative report would suggest the absence of altered bile. In cases where bile is present in the stool, but not in the form of urobilin, we infer that the bile has not undergone the conversion by putrefaction that it normally should in the small intestine. This is probably due to a hypermotility of the small intestine as a result of which insufficient time for conversion has been allowed. It is also possible that in certain cases of chronic intestinal stasis, where fermentation and putrefaction are conspicuously absent, unaltered bile may be noted in the stool. Ordinarily if bile is secreted by the liver and enters the intestine it should show in the feces as urobilinogen. The total absence of bile might speak for total suppression of biliary secretion in the liver, either temporary or permanent; or obstruction to its outflow as a result of duct blockade through calculus, stricture, growth, adhesions, spasm, etc. As a result of the absence of bile in the intestinal tract, digestive disturbances will ensue in the nature of incomplete saponification and incomplete splitting of fat into its simpler components, fatty acids and glycerin, as well as disturbed intestinal absorption with occasional disturbed motor function.

Ferments.—Other tests which are performed upon the stool are the ferment tests from which we gain an idea of the effectiveness of the digestive power to which foods are subjected in the intestine. By Wohlgemuth's method or a modification thereof, we are able to ascertain the diastatic activity of the secretions within the intestinal canal, i. e., from the result of stool findings we make deductions regarding the power of intestinal amylolytic function. The result of stool study is expressed in units. Each unit represents one c. c. of one per cent. starch solution. Therefore, should the quantity of ferment dissolved in one per cent. *NaCl* solution that corresponds to one c. c. of the fecal residue be powerful enough to digest 500 c. c. of one per cent. starch solution, we would consider the diastatic activity of the feces 500. In a similar manner, the Gross or modified Gross method will give an idea of intestinal tryptic activity. The units here imply digestion of cubic centimetres of 0.1 per cent. casein solution. If 100 c. c. of 0.1 per cent. casein solution is digested by one c. c. of fecal residue, the tryptic unit is 100. In a similar manner, the lipolytic power is determined by a study of its digestive activity upon monobutyric or ethyl butyrate. These simple fats are split up into fatty acids and glycerin. From the amount of fatty acids formed as expressed by an

increase in acidity of the tested mixture, we attain an idea of the power of lipolytic activity.

Bacteria.—From a bacteriological standpoint, little will here be said concerning the stool. We know that the stool normally consists of a vast number of bacteria, most of which are saprophytic. Strasburger found that the percentage of bacteria by weight in a normal stool was about $33\frac{1}{3}$ per cent. Some are so called pathogenic organisms, but act only in a disease producing manner on special occasions and during such a period occur in the stool in abnormally large quantities. In typhoid fever, we would naturally expect an overgrowth of typhoid bacteria in the intestinal contents. In the same way, we would expect to find an increase of the comma bacillus, Shiga bacillus, and tubercle bacillus in their respective diseases. The organisms can be distinguished by their characteristic growths upon different culture mediums and by their peculiar staining reactions. Other organisms can be recognized in a similar manner. At times even the Opler-Boas bacilli and other lactic acid bacilli may be noted.

In this paper, the more common examinations with which the stool is concerned have been considered. Such studies as the Schmidt fermentation test, dissolved albumen test, and bacteriologic methods were purposely omitted.

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A NEW METHOD OF PRESERVING AND MAILING SPECIMENS FOR A WASSERMANN.

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This method is especially applicable in cases in which the specimen must be sent some distance to the laboratory. It consists of applying a small square of cantharidal blister plaster to a convenient point on the skin; removing it in about two hours; placing over this point a vaccination shield; and next morning puncturing the blister with a needle and collecting the serum on special blotting paper. The serum is allowed to dry and the paper is then enclosed in an envelope and mailed to the laboratory. The advantages are simplicity in collecting material, convenience in mailing, and the keeping property of the serum in a dry state. Venipuncture is rather an easy operation when you have the proper needle and much practice, but with a dull needle and the amount of experience in this line that most physicians in general practice have, it is usually very exasperating for the doctor and a very painful ordeal for the patient. The blister method is obviously simple and is painless to the patient. When blood is used as material upon which the Wassermann is done we have to be extremely careful in having the container sterile and the blood must be kept on ice to prevent bacterial growth. If bacterial growth occurs it changes the

blood and its serum so that it is impossible to carry out a reliable Wassermann test upon it. It is therefore impracticable to send blood to a laboratory if it will have to be on the way a long time. The serum dried on paper will retain its power to produce a Wassermann reaction for ten days or more and, being in a dried state, is not affected by bacterial growth.

Another advantage of this method is that the laity are not familiar with it, while the blood test and what it is for is known by a great many people. When we ask a patient, especially a woman, to allow us to make a blood test, the chances are, that we will offend her or some of her family, for they know at once that syphilis is suspected. It is essential, however, that syphilis be ruled out of many of the chronic cases we are called upon to treat.

DUGAN-STUART BUILDING.

WHEN A CANCER IS NOT A CANCER.

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My title seems to me to express a condition that not infrequently comes before a physician. Sometimes, even though well defined symptoms exist, it is difficult to determine whether a patient has a cancer or not. The point that I particularly wish to make and emphasize in this article is that we do not always find cancer present in cases that have been definitely pronounced cancer even though the clinical picture is practically typical. The following few case reports will best illustrate what I wish to bring out.

CASE I.—MRS. M., aged fifty-five years, Mexican, came to me from the City of Mexico. She was the mother of fourteen children and had always enjoyed good health until a few months previous. Her family history was negative. She complained of more or less aggravated distress after eating. There was almost constant pain in the stomach. She had lost about thirty-five pounds in weight, was weak, pale, and cachectic, this condition progressing rapidly. There was almost complete loss of appetite, in fact a repugnance for food. Physical examination revealed nothing except a slight tenderness and rigidity on pressure over the epigastric region. No mass could be palpated. Hydrochloric acid was absent. Considerable mucus was present. Malignancy had been diagnosed in Mexico City. A local physician saw her in consultation and he likewise believed that we were dealing with a case of cancer. The patient was almost too weak for an exploratory operation and refused to have this operation done. The clinical picture was certainly one of malignancy. In the absence of any palpable mass I decided to treat her as though the condition were one of nonmalignancy. On account of the presence of considerable mucus I used lavage for several days with no favorable results. I then gave the stomach absolute rest and resorted to rectal feedings for several days. I then began to give small quantities of food by mouth at very frequent intervals and each day increased the amount until in the course of several days she was getting quite a large amount of nourishment. With absolute rest in bed and with the forced feeding that was necessary on account of the repugnance for food we were rewarded at the end of several weeks with a gain of about forty pounds and a picture of health. This was eight years ago and she is still enjoying splendid health.

This case impressed me very forcibly, especially when I thought of the narrow escape this patient had from death by what was supposed to have been cancer of the stomach.

CASE II.—Three years ago I was called in consultation to see a lady, fifty-four years old, who had been confined to bed for several weeks. She complained of profound weakness. She had a marked disgust for food. There was a constant uneasiness in the region of the stomach, and this was frequently increased to the extent of being quite painful. This uneasiness was often aggravated after eating. She was exceedingly pale. Her hemoglobin was below fifty per cent. She had the peculiar cachectic appearance frequently found in malignancy. There was considerable occult blood in the feces. Her stomach analysis showed no hydrochloric acid and a trace of lactic acid. The duodenal thread test was negative. The attending physician, a very prominent and thorough man, was quite positive that the patient had cancer. He was so firmly convinced of this that he urged the family not to have consultation in order to save them the expense. The use of an x ray was not possible and an exploratory operation could not be done. I agreed with the attending physician that symptoms and findings pointed strongly in favor of cancer, but as we could not be positive it might be of some avail to attempt to build her up. There was little fighting spirit left in the patient and it was with a great deal of difficulty that we could get her to take the small amount of nourishment prescribed each day. After many days she had a faint relish for a few articles of food and from that time on the sailing was much easier. After several weeks her hemoglobin returned to normal and in a few months she was enjoying her friends and domestic activities as formerly.

CASE III.—A dressmaker, fifty-three years old, had to give up her work on account of pain in the upper part of the abdomen which had gradually grown worse for several weeks. With this she had lost her appetite, and had become very weak and pale. There was a marked rigidity and some tenderness over the upper portion of the abdomen. Hydrochloric acid was absent. There was some vomiting, but no motor insufficiency. The feces were negative. An exploratory operation was advised, but the patient refused. Her physician had made the diagnosis of cancer with very unfavorable prognosis. After a few weeks of coaxing and urging her to take her nourishment she began to make some favorable progress. After this she gained considerably and the pain gradually disappeared. This was nearly two years and a half ago and there have been no symptoms of recurrence.

My greatest difficulty in these cases has been to get the patient to eat. I believe that failure in many of these cases is due to the haphazard way the physician gives his instructions and to the lenient way that they are carried out. I have found it necessary to be exacting in the amount of food to be given and the exact time at which it should be taken, and each day to make a definite increase or decrease as the case may demand. It would be difficult to outline any specific method that I have used as each case is a case unto itself. I have in most cases started with exceedingly small amounts and have fed very frequently, often every hour, and each day have gradually increased the amount according to indications. Milk and eggs are usually started with, if they can be taken, and then other nourishing foods added as soon as they can be borne.

I believe that in the cases here reported, the patients were suffering chiefly from malnutrition, as the results, at least, seem to indicate. I believe, also, that many of the obscure cases of milder types, often diagnosed as malignancy, are merely cases of malnutrition. With the correcting of more cases of nutrition there will be fewer exploratory operations and possibly a diminution of operations for the removal of supposedly affected organs, as I hope to demonstrate in a later article.

MOORE BUILDING.

A TWO STAGE OPERATION FOR TENDON SUTURE IN THE HAND, AND DESCRIPTION OF A SIMPLE STITCH.

By JOSEPH E. FULD, M. D.,
New York.

Instructor in Operative Surgery, College of Physicians and Surgeons, Columbia University; Assistant Visiting Surgeon, Gouverneur and City Hospitals.

The advisability of a two stage operation for repair of severed tendons in the hand first presented itself to me in 1914. I then had occasion to operate on a patient whose flexor tendons of the index finger had been severed some two months previous. There had been no attempt made at the time to suture the tendons, and the result was a finger not only useless, but always in the way and interfering with the function of the hand.

I was much disappointed, six weeks later, after

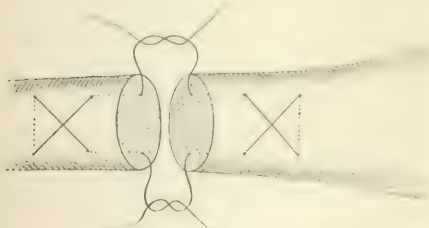


FIG. 1.—Suture in place. Knots only partly tied.

having operated to relieve the condition, to find there was no restoration of function, and the finger practically as bad as before, naturally inferring that the sutured ends of the tendon had separated. So I operated the second time, with the idea of again picking up the tendon ends. At the second operation I found the tendon intact, but voluntary motion prevented by adhesions. Ten days after the tendon was cleared of these adhesions, passive movements were instituted, and a very satisfactory result obtained, which has continued to the present time. I believe the above instance and several analogous cases warrant the adoption of an operative procedure in two stages: a first stage when the tendons are united and six weeks allowed for the union of the parts, and a second when the resulting adhesions are divided and passive motion begun immediately upon healing of the wound.

If called upon to perform the first stage of the

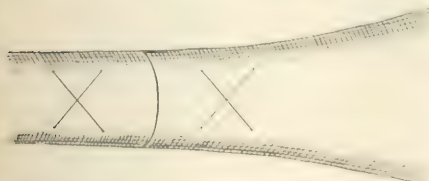


FIG. 2.—Suture tied. Knots buried between cut margins of tendon.

operation at the time of injury, it is essential to have absolute cleanliness. The wounded part should be covered with sterile gauze, and the surrounding skin cleansed with two or three pads wet with benzine. Hot saline solution poured into the wound

will remove foreign and infective material, and finally the entire finger and hand should be given a coat of iodine. A tourniquet applied makes the field bloodless and easier to find the divided ends. The wound is generally transverse, and if it is necessary to enlarge it, employ the lateral and curvilinear incision, because the usual longitudinal one in the median line of the palmar surface often results in progressive contracture, with permanent flexion. The wound edges being retracted, the distal end of the tendon is readily found, as it does not



contract to any great extent. The proximal end, however, often retracts beyond view. Sometimes after flexing the finger a closed forceps can be passed up through the sheath to where the tendon can be felt and caught, and then brought down to view. If the retracted tendon cannot otherwise be brought down, an incision can be made opposite the point of retraction, a stitch passed into the tendon end, and by means of an old fashioned large eyelet probe, be brought down through the sheath.



Lateral, short incisions onto the fibrous sheath are to be preferred to one long, continuous one, which might permit prolapse of the tendon.

The retracted tendon, when located, should be drawn through its sheath, downward through a lateral incision, and one eighth trimmed off each end, so that no dead tissue intervenes when the cut surfaces are fully apposed. We are now ready to insert the special sutures, and, when they have been placed, the tendon ends are returned to their sheaths and the sutures tied.

TECHNIC OF THE AUTHOR'S TENDON STITCH.

The needle enters the tendon on its lateral surface one half inch above the cut end, passes transversely through one half the thickness of the tendon, to emerge on the opposite side. The needle then enters the tendon on its anterior surface at a point one quarter of an inch from its cut end, three fourths of the distance across the tendon. Perforating to one half its antero postero thickness, it passes longitudinally through the length of the tendon, emerging at its cut end to one side of the median line. The free end of the silk is crossed diagonally over the other suture, perforates the tendon one quarter inch from the cut end, passes through the length of the tendon, and emerges on the other side of the median line. Sutures are now passed in similar fashion into the other end of the cut tendon and then tied to corresponding sutures opposite; burying the suture knots between the approximated tendon ends. Where the two severed tendon ends cannot be brought together because of muscular contraction, or because they are deeply buried in dense fibrous tissue, I have obtained good functional results by removing the injured segment, and inserting a graft of tendon with its sheath. A strip of the tendo achilles may be used. The tendons of the palmaris longis, flexor sublimis digitorum, extensor communis digitorum can be easily dissected with their sheaths, and make excellent grafts for tendon defects in the hand and fingers. The tendon sheath is then sutured with fine catgut.

Provided the wound be healed, passive movement can be commenced at the end of three weeks. Voluntary motion should not be begun before the end of six weeks, as it has been demonstrated by animal experimentation that it takes six weeks for a cut tendon to be firmly united. Before that time, newly united tendon will stretch, with loss of good functional results. Passive movements should be made with as long excursions as possible, and the best results are obtained if these passive movements alternate with absolute rest. Even though passive movement has been started at the end of three weeks, and voluntary motion attempted at the end of six, the development of adhesions is almost inevitable, making necessary the second stage of this operative procedure.

In three of my cases, the tendon had united perfectly, yet adhesions had interfered with function, and a good result was only obtained after the following secondary operation was performed.

TECHNIC OF THE SECONDARY OPERATION.

Make a lateral, longitudinal, curvilinear incision, the longitudinal part of the incision placed midway between the palmar digital nerve and artery, on a level with the flexor tendons and dorsal artery. The curved part of the incision is directed toward the volar surface. A flap of skin and subcutaneous tissue is raised and retracted to bring into view the sutured tendon, and if bound down by adhesions must be freed to leave the tendon surface smooth. In addition, the sutured segment must be the same size as the rest of the tendon. When the wound has healed, inaugurate gentle, passive movement with long excursions and rest intervened.

Note that the stitch above described avoids post-operative separation of the tendon ends; is easy and

rapid of accomplishment, and, by burying the sutures between the accurately approximated tendon ends, we obtain a smooth surface, avoiding adhesions at a point where a knot on the surface would encourage them. The second operation is first mechanical, with good apposition (the aim sought); secondly, we have a sterile operative field and non-traumatized tissue to work on, and when the resulting adhesions are divided and passive motion begun, immediately upon healing of the wound, a satisfactory functional result follows; adhesions will be prevented by new bursal formation over the raw surface.

The literature affords scant information in the field of tendon suture, yet it is most interesting, pregnant with disappointment when poorly done, but, properly done, marks a step forward in modern tendon surgery.

CASE.—Miss Irene D., age twenty-two years. January, 1914. The flexor tendons of the left index finger were cut across at the junction of the proximal and middle phalanges, and at the time of injury no attempt was made to suture the tendon. Patient was referred to me about six weeks after injury and tendon ends were sutured. I was much disappointed six weeks later, after having operated, to find there was no restoration of function and the finger practically as before. At the second operation, six months after the first, I found the tendon intact, but voluntary motion prevented by adhesions. Ten days after the tendon was cleared of these adhesions and passive movements were instituted and a very satisfactory result obtained, which continues to the present time.

The accompanying photographs show the degree of voluntary flexion and extension obtained after operation.

101 EAST EIGHTY-FIRST STREET.

HYDRONEPHROSIS AS AN UNDERLYING CAUSE IN ATTACKS OF ACUTE ABDOMINAL PAIN.*

BY SERGEANT PRICE MARTIN, M. D.,
Buffalo, N. Y.

The term hydronephrosis implies, briefly, a dilatation of the renal pelvis due to an abnormal accumulation of urine. The renal pelvis as well as its ureter may become dilated at any period of life and in either sex as the result of the following conditions: 1, mechanical obstruction; 2, infection, and, 3, tumor.

As the result of constant mechanical obstruction to the ureter, that portion of the ureter above the obstruction and the renal pelvis will become dilated. The dilatation varying in amount according to the duration and extent of the obstruction. The dilatation is also accompanied subjectively by pain. The pain varies in intensity from a slight dull ache to severe, sharp, knifelike attacks radiating from the loin or epigastrium on the affected side down across the lower abdomen into the genitalia, often so severe that opiates are required before relief is obtained. A complete uranalysis, as a rule, in these cases will reveal no pathological findings. An x ray examination of the kidney and ureter on the affected side will also generally prove negative. The examination having been carried out and found negative, the kidney then is excluded in the diagnosis.

*Read before the Rochester Pathological Society, Rochester, N. Y., November 21, 1917.

The patient may be told, especially if the pain has been on the right side, that he has appendicitis, and that an operation is his only hope for a cure. An appendicectomy may then be performed and, the attacks of pain still persisting, the patient is frequently subjected to a second operation for the removal of the gallbladder, or if the patient is a woman, often an ovary. Still no relief is obtained and the patient then goes from one physician to another, being treated for neurosis, lumbago, ptosis, indigestion, and so forth, while the real underlying cause of the trouble is entirely overlooked.

This is the type of case that should have a complete urological examination to determine the possible existence of a hydronephrosis. The urological examination should include a complete uranalysis of a twelve or twenty-four hour specimen to verify the previous negative analysis; an x ray examination of the entire genitourinary tract to determine whether a calculus is lodged in the kidney or ureter on either side, though all the subjective symptoms may be present only on one side. Should these plates prove negative, a cystoscopic examination should be made with the catheterization of both ureters.

As a rule, with hydronephrosis of moderate degree the demonstration of more or less obstruction to the ureteral catheter in the upper ureter and, following this, the existence of residual urine beyond the obstruction which is characterized by its rapid flow, will suffice to call our attention to the probable existence of a hydronephrosis. Should any doubt arise, however, the condition can be further demonstrated by means of the overdistention method. Thus, if an ounce or more of sterile solution can be injected into the renal pelvis without any evidence of return flow around the catheter before pain is caused, it may be safe to say that hydronephrosis is present. However, if on distention a pelvis will only hold from fifteen to twenty-five c. c., the question then arises, are we dealing with a renal pelvis the normal capacity of which is from five to ten c. c., but which is dilated to two or three times its normal capacity, or with an unusually large normal pelvis? The existence of only a small amount of residual urine in the pelvis also might easily be confused with the rapid flow of hypersecretion from nervousness. In order, therefore, to determine the exact condition present, the outline of a well distended pelvis as seen in a pyelogram may prove of more definite diagnostic value than any other data.

The first deviation from normal to be noted in a pyelogram in early hydronephrosis is a flattening of the terminal irregularities seen in the normal minor calyces while the more advanced cases vary depending on the size of the hydronephrosis from a mere flattening of the apices of the major calyces to the complete diffusion of the calyces and pelvis into a diffuse outline of a rounded sac. The pathological changes that take place in a hydronephrosis may be summed up as follows: At first only the ureter, pelvis, and calyces are dilated, but sooner or later, if the condition persist, the kidney substance is thinned out and stretched over the distended calyces until the parenchyma has almost disappeared and the kidney is represented only by a mere shell

surrounding a loculi of fluid. The surface often appears lobulated, resembling a fetal kidney. This lobulation while strongly suggesting a congenital cause, yet may be seen in acquired cases.

A hydronephrosis may not be larger than a normal kidney or it may attain gigantic dimensions, containing a gallon or more of fluid. The fluid is usually pale and clear, containing minute quantities of urea, uric acid, chlorides, phosphates, and so forth, though eventually it may cease to resemble urine in any degree, containing perhaps a little chloride and cholesterol. It is usually acid or neutral, may contain a trace of albumin, and is of low specific gravity, 1007 to 1010. It may become turbid, pigmented, or even blood stained. The inner surface of the sac is smooth and lined by flattened epithelium, unlike a pyonephrosis which is lined by granulation tissue, and occasionally the wall may contain calcareous plaques, which may be mistaken for calculi in the x ray plate.

The histological changes that take place, depending on the duration of the obstruction, are as follows: 1. There is a dilatation of the tubules with flattening and atrophy of the lining cells, many of which are shed. 2. The cells of the interstitial tissue have multiplied and produced a fibrocellular network filled with round cells around the tubules. Interstitial hemorrhages will be seen when the blood-vessels have been pressed upon. 3. The tubules have undergone atrophy and many have disappeared; their places being taken by fibrous tissue. 4. Bowman's capsules are at first distended with fluid, and the glomeruli are pushed aside, but finally they are replaced by fibrous tissue and disappear. The accompanying plates may help demonstrate briefly a normal renal pelvis and a few of the different types of hydronephrosis.

The outline of the normal renal pelvis may assume a great variety of size and shape, depending to some extent on the degree of distention by the injected medium. Unless the pelvis is fully distended, its exact outline cannot be accurately ascertained. Incomplete distention may give an erroneous impression of the outline, and may lead to error in interpretation. The normal pelvis may be elongated as seen in Fig. 1, or it may be large and well rounded as seen in Fig. 2. When the entire pelvis outline is unusually small, the diminution in size of the true pelvis is also shared by the calyces as seen in Fig. 3. The lower portion of the true pelvis usually tapers gradually into the upper ureter, causing a pyramidal outline in the pyelogram. The first portion of the ureter, extending as far as the first point of the narrowing, is usually broader than the ureter below it. This is illustrated in Fig. 2. The ureter as a rule leaves the pelvis at a point where the median and lateral borders meet. The angle formed by the ureter with the lower surface of the pelvis is usually broad and rounded. When the angle is acute it is suggestive of pelvic dilatation though it may be due to marked rotation as the result of renal excursion.

The outline of the major calyx may be divided into three parts: 1. the base, or the portion where it leaves the true pelvis; 2. the isthmus, or the cylindric portion which leads to a variable distance from the true pelvis; and 3. the apex, or terminal

portion of the calyx from which the several minor calyces extend. The variations from this common type are many and at times it may be difficult to identify the various divisions. Ordinarily there are three major calyces; there may, however, be an increase or decrease from the usual number. Unusual length of the isthmus of one or more calyces is not infrequently seen. It is more apt to occur in the upper calyx and is regarded by Braasch as the result of partial reduplication of the pelvis. In Fig. 2 the upper major calyx is connected with the true pelvis by a long isthmus which extends upward an unusual distance. The middle calyx is apt to be smaller than the other two, and even may be very rudimentary or entirely absent.

The outline of the normal minor calyces is usually characterized by an irregularly pyramidal shape,



FIG.—1, diagram of normal pelvis; 2, normal pelvis; 3, normal pelvis; 4, early hydronephrosis; 5, early hydronephrosis; 6, hydronephrosis; 7, hydronephrosis; 8, hydronephrosis; 9, hydronephrosis.

[Figs. 6, 7, and 8 are taken from the collection of pyelograms made at the Mayo Clinic while the author was assistant in the Urological Department. He wishes to thank Dr. William F. Braasch, head of the Section in Urology, for the use of them.]

extending from the apex of the major calyx to a variable distance into the parenchyma. Upon close inspection these terminal irregularities are seen to be caused by indentations of the minor papillae into the ends of the calyces. The radiogram shows but one border of these indentations, and therefore gives the minor calyx a pyramidal appearance. The typical arrangement and appearance of the terminal minor calyces is very well illustrated in Figs. 2 and 3. Whenever such uniform irregularity is present in all the calyces, the pelvis may definitely be called normal, and the absence of chronic pathologic process in the kidney may usually be inferred. Several minor calyces more or less rounded and indefinitely outlined may occasionally appear in the

normal pelvis. Even though a few of the minor calyces are not well defined, as long as the other calyces are normal, it is usually safe to infer that the entire pelvis is normal. As a rule the minor calyces are narrow and short, but occasionally they are seen to be of considerable size.

Probably the first deviation from normal to be noted in the pyelogram with early hydronephrosis is the flattening of the terminal irregularities seen in the normal minor calyces. In Fig. 4 the ends of all the minor calyces are seen to be flat, and while the pelvis itself does not appear dilated there is a slight dilatation of the ureter. In Fig. 5 the ends of the minor calyces are flattened, the major calyces, pelvis, and ureter are also somewhat dilated. This represents a more advanced stage of early hydronephrosis than Fig. 4. In Fig. 6 we have a slightly more advanced stage than Fig. 5. The ends of the minor calyces are seen to be flat, there is some broadening of the major calyces, and dilatation of the pelvis and ureter. In Fig. 7 the outline of a relatively large true pelvis is visible. The uppermost calyx is broadened and shortened while the other major calyces are only suggested by the irregular indentation of the general contour, and the minor calyces are completely effaced.

In Fig. 8 the outline of a large hydronephrotic sac is visible with detached areas of greatly distended calyces. The ureter is seen to bend acutely upon itself and enter the pelvis from below the level of the sacrum. In Fig. 9 the pelvis is dilated to such a degree that the kidney is practically destroyed, and in its place is a huge sac. Although three ounces of fifteen per cent. collargol solution were injected into this pelvis the outline is extremely dim because of the retained fluid; it can be seen, however, to fill the entire right side of the abdominal cavity. Of course such a pyelogram is only exceptionally permissible, as so large a hydronephrosis ordinarily may be determined by means of the cystoscope and urethral catheter.

The object of this article is to try and demonstrate to the general practitioner the importance of bearing in mind the possibility of a hydronephrosis as the underlying cause in all doubtful cases of attacks of acute abdominal pain, and to urge upon him the advisability of consulting with a competent urologist before subjecting his patient to unnecessary operations.

504 ELECTRIC BUILDING.

Face Mask in Control of Contagious Disease.

—Joseph A. Capps (*Journal A. M. A.*, March 30, 1918) calls attention to the difficulty of preventing the development of secondary infections in military hospitals and records very satisfactory results from the combined employment of the cubicle system of isolation and the wearing of gauze face masks by all of the attendants and the patients whenever the latter become able to leave their cubicles. He also suggests the possibility of securing a further degree of prevention by making every patient, irrespective of his disease, apply and wear a face mask from the moment of his entering an ambulance until he arrives in his bed in the cubicle.

Our Readers' Monthly Prize Discussions

Twenty-five Dollars Is Awarded for the Most Satisfactory Paper

All persons, whether subscribers or not, are invited to compete for the prize of \$25 offered for the reply deemed best by the editors to the following questions:

CXCII.—How do you treat whooping cough? (Closed.)

CXCIII (and last).—What kind of feet must a soldier have? (Answers due not later than April 15th.)

These competitions, which have now been running some fifteen years, will henceforth be discontinued, as a very wide field of medicine has now been covered and the exigencies of war necessitate economy in space.—EDITOR.

The award will be based solely on the value of the information contained in the answer. No importance will be attached to literary style. Answers should preferably contain not more than six hundred words, and should be written on one side of the paper only. All papers submitted become the property of the JOURNAL, and should bear the full name and address of the author for publication. The prize will not be awarded to the same person more than once within a year.

The prize of \$25 for the best answer to Question CXCII has been awarded to the writer of the first paper, but neither name nor address accompanied his manuscript, and we await a communication from him.

—PRIZE QUESTION NO. CXCII.

TREATMENT OF WHOOPING COUGH.

The management of whooping cough consists mainly in the application of those measures which tend best to reduce the number and severity of the paroxysms, to allay nervous irritability, to lessen congestion of the cerebrum and respiratory systems, and to treat subsequent or existing complications.

General Measures. Firstly, fresh air, which lessens the number and severity of the paroxysms, nervous irritability, and tends to prevent bronchopneumonia. A quiet outdoor life, preferably between 10 a. m. and 4 p. m., free from all excitement, should be advocated both in winter and during warm weather. The exceptions to this are on windy, raw and stormy days, and in infants and delicate children, who then are better kept in their rooms, which should be thoroughly aired. Clothing should be light and yet warm. In infants it should be frequently changed, also the bed clothes. The bed should be warmed before putting the child in, as cold bedding may cause a paroxysm. Careful feeding is of great importance. It may become a serious problem, owing to the frequent vomiting which renders the nutrition of the child below normal, and thus predisposing to complications. Chronic indigestion and abdominal distention, particularly in infants, may increase the paroxysms. The diet should be light and nourishing. In infants it should be chiefly of milk, diluted or partially peptonized. In older children, a raw egg can be added, well beaten, to the milk. Cereals and crackers are allowable. The tendency should be to feed less amount and at frequent intervals, which will prevent frequent vomiting. If vomiting occurs during a paroxysm, food may be given shortly after, as there is usually a period of comparative quietness afterwards. Much attention should be given to the bowels, castor oil usually, enamata when necessary, but omit any medication which causes stomach disturbance.

Local application comprises inhalations, sprays, and the like. When an accompanying coryza exists, two drops of a two per cent. solution of argyrol into each nostril every morning will lessen the annoying discharge. The beneficial results from the application to the rhino-pharynx is not great. When

employed, a one per cent. solution of resorcin or carbolic acid can be used twice a day, but cocaine should never be used. Inhalations facilitate the expulsion of mucus, allay irritation and act as possible antiseptics, and creosote, creolene, carbolic acid, and oil eucalyptus may be used, one teaspoonful to a pint of hot water, and the steam inhaled. Of these, creosote and creolene are the most effectual. They may be used on cotton in a respirator, or vaporized over an alcohol lamp, though a possible absorption should be borne in mind. Watch the urine. Sulphuric acid has been used, by burning sulphur pastilles with good results in some cases. Cypress oil may be used, diluted with five parts of alcohol, two or three teaspoonfuls poured on a pillow or underclothing, four times a day. Of the sprays, a two per cent. solution of salicylic acid or resorcin every three hours is most efficacious.

Internal Medication. Of the drugs which have proved as sedatives, antipyrine, belladonna, heroin, bromides, codeine give the best results. Chloral and bromoform have been used with varying results. Dose according to age. The following controls the spasms well.

Antipyrine;
Sodii bromidii;
Aque, q. s.;
Tincturæ belladonnæ;
Elixir aurentii.

M. Sig. S. every two hours.

Heroin hydrochloride in 1/100 gram doses acts very well in many cases. Also, codeine in doses of one sixtieth to one fourth gram, which often relieves excessive vomiting. To relieve the congestion of the bronchi the expectorants should be used.

Vaccine. A mixed vaccine with the Bacillus pertussis (Bordet-Gengau) predominating is recommended, which should be given in the first stage: a large initial dose, 1,000 million. In children under one year, or when a complication exists, 500 million, and increase from this to 1,800 million; the maximum quantity should be 4,000 million. This should be given every other day until the symptoms subside.

When the paroxysms are frequent and of great severity, chloroform can be used to ward off convulsions. To prevent dangerous asphyxia, intubation should be resorted to, as the tube entirely over-

comes the glottic spasm, which is the chief cause of suffering and danger.

Dr. Henry J. Schwartz, of New York, says:

As soon as whooping cough is suspected, or the diagnosis established, the child should immediately be isolated and placed in a room which can be properly ventilated. School should be discontinued if the child is attending same. The danger to others exists until the paroxysmal stage has ended, which means six weeks or more.

The chief concern of the physician should be the reduction of the number of paroxysms per day. This may be controlled by giving the child an abundance of fresh air. A well ventilated room is preferable to the freedom of the street, as it lessens the danger to others. Excitement, as crying and laughing, as well as irritating vapors and gases, as smoke and kitchen odors, should be avoided. These remarks may seem superfluous, but they are factors initiating new paroxysms. The child should be protected from extreme cold by suitable clothing. The diet is of immense importance. It is essential that weight be maintained, as there is a tendency to undernourishment, and in infants to marasmus and rickets. The child should be fed at frequent intervals, and if vomiting occurs after feeding it should be fed again as soon as the child becomes calm. During the period of marked paroxysms the diet should consist of milk only. Cream should be added to maintain calorific value if the age of the child demands it. As the paroxysms lessen in severity and frequency, additional food is permitted. To allay the irritability of the stomach in bad cases, the milk may be peptonized. In extreme cases, rectal feeding must be resorted to. Attention to the bowels is, of course, necessary. The local treatment of inhalation of steam and drugs, as creosote, and the use of sprays is, to my mind, useless. The difficulty to administer these to children increases their irritability, causing new paroxysms, so doing more harm than good. Drugs are used in cases otherwise than mild, while those of moderate severity and severe ones require sedatives. Bear in mind that the stomach does not tolerate drugs well, and all nauseating and irritating drugs should be avoided, as they bring on additional paroxysmal fits of coughing and vomiting. Where drugs must be forced on the patient, it is best to use other channels for the same reason.

Opium derivatives, as heroin and codeine, are to be used when others have failed, and in older children only. The chief drugs of value are belladonna, in the form of a tincture; quinine, bromoform, in drop doses on sugar, and antipyrine, which is to be used with caution in cardiac conditions, and when pneumonia exists. Belladonna is most efficacious when given in ascending doses until the physiological effect is obtained. Where stimulants are needed, use alcohol. As soon as paroxysms cease, or are only present at rare intervals, discontinue medication. Bronchitis is always present in the larger bronchi, but when found in the smaller bronchioles, bronchopneumonia must be looked for. In the warmer months, an ilioecolitis with its diarrhea must receive immediate attention. Malnutrition, anemia, marasmus and hernia due to cough are to be

attended to in the stage of decline. Bear in mind the increased susceptibility to pulmonary tuberculosis in these cases.

The treatment with sera and vaccines has, according to the best authorities, added little of any therapeutic value in this condition.

Dr. C. C. Henin, of Springfield, Mass., writes:

Pertussis, or whooping cough, is an acute infectious disease of unknown bacteriologic origin, although Bordet and Gengau claim that the bacillus first described by them is the cause of whooping cough. Being an infectious disease, attention must be given to:

1. *Hygienic treatment.* During the catarrhal stage, the patient should be kept in bed if feverish. The room should be ventilated several times a day, and the temperature of the room should be kept between 60° and 70° F. Infants and very delicate children should be confined to the house throughout the attack, especially in the autumn and winter. The entire body should be sponged once each day with tepid water. The diet should consist of easily digested soft foods, of which milk should be the chief. After the paroxysmal stage is well advanced, change of climate, especially to warm, dry, and the seashore, is most helpful.

2. *Medicinal treatment.* This may be divided into local and internal. Remedies are administered by inhalation and local applications to the upper throat and larynx. The remedies used are creosote, tincture of benzoïn, cresolin, and carbolic acid. About 15 grains of menthol, with one or two drams of the compound tincture of benzoïn, are placed in the croup kettle filled with hot water. The patient, with the eyes bandaged, is placed within a few feet of the end of the spout, and the vaporization is continued for an hour or more. Vaporization with creosote is used alternately with the above. The drug is placed on the sponge in the neck of the spout, and the vapor directed into a tent made by throwing a sheet over the top of the infant's crib.

As to the internal remedies, those which have stood the test are antipyrin, belladonna and quinine. The following prescription may be given to a child two years old:

℞	Antipyrini,	gr. xxx;
	Glycerini,	3iii;
	Aqua,	ad ʒij.
Sig:	One teaspoonful every three hours.	
℞	Sod. bromidi,	ʒi;
	Antipyrini,	ʒss;
	Glycerini,	ʒiii;
	Aqua,	q. s. ad ʒij.
Sig:	One teaspoonful in water every three hours.	

As to complications, the most frequent are bronchopneumonia in infancy, bronchitis; convulsions result from congestion of the brain. In ordinary attack of cardiac depression, camphorated oil in sterile olive oil may be given hypodermically in doses of three to ten minims, according to the age.

Last summer I treated twenty cases of whooping cough with the vaccine therapy, and found it of great help. It has shortened the period of the paroxysms. In children over a year old I have used initial dose of 500 million; two days later, one billion; several days later a third injection was given of two billion.

Medicine and Surgery in the Army and Navy

RECONSTRUCTING CRIPPLED SOLDIERS OF FRANCE.

BY DOUGLAS C. MCMURTRIE,
New York,

Director, Red Cross Institute for Crippled and Disabled Men;
President, Federation of Associations for Cripples.

The medical and surgical treatment given to a wounded man in a military hospital is only the first step in the process of reconstruction. After his wound is healed and he has received the necessary functional treatment for his injuries or has been fitted with an artificial limb, he may still be unable to take his place in the social and industrial life of the country. His shattered body has no longer the strength required in the only kind of work he knows how to do; the loss of his leg prevents him from standing all day at his old job; he cannot manage his

living in spite of his wounds in trades suited to reduced physical capacities.

Serious vocational training for the disabled French soldier was first proposed by M. Edouard Herriot, Mayor of Lyon and Senator from the Department of the Rhône, in his article in the *Paris Journal*, of November 23, 1914. Three weeks after broaching the subject, he opened in Lyon, in an ancient building formerly belonging to one of the expelled religious orders, a municipal trade school for disabled soldiers. Although it then had only three pupils, it grew rapidly, and by May of 1915 M. Herriot found himself obliged by press of numbers to organize a second school. The first, known now as the *Ecole Joffre*, and the second, called the *Ecole de Tourville*, have served as inspiration and model to most of those since formed throughout the length and breadth of France.

In city after city of the provinces—Bourges, Montpellier, Saint-Etienne, Toulouse, Marseille, and others—associations formed for aiding the *mutilés* recognized the worth of M. Herriot's idea. Early in 1915, there was formed in Paris under the leadership of Maurice Barrès, a deputy and distinguished man of letters, the great *Fédération nationale d'assistance aux mutilés*, which in a few months by means of M. Barrès' stirring appeals in the *Echo de Paris* collected more than 2,000,000 francs for the purpose of rehabilitating the *mutilés* through work. The federation has established two schools of re-education in Paris, and gives financial support to others organized by private persons and trade unions. In May, 1915, the national government opened a splendidly equipped trade school for disabled soldiers in a former home for industrial cripples at Saint-Maurice, just outside of Paris; a little later the City of Paris commandeered a common school building and transformed it into a school for the maimed of the Department of the Seine. The Minister of Commerce organized special courses for *mutilés* in existing trade schools; the Minister of Agriculture did the same in the agricultural schools scattered through the provinces. Departments, municipalities, boards of technical instruction, employers' associations, trade unions, and private philanthropists, both French and foreign, joined in the movement, until at the present time there are more than one hundred re-educational institutions in France.

Many schools made possible originally by private subscriptions have since been attached to a public administrative body—a departmental or municipal government, chamber of commerce, hospital, or the like. The expenses of such institutions are borne in part by the public body—which may still ask for private subscriptions—and in part by the national government. In order to obtain a subvention from the government, schools must submit their program and budget for ministerial approval. Schools entirely under private control may also apply for a subvention from the government, which, if it is granted, will be in proportion to the number of their



FIG. 1. Soldier with double arm amputation being trained as a bookkeeper.

old tools with only one hand. Idleness and dependence seem the only prospect. A pension does not give him what he most needs, for though providing the bare necessities of life, it certainly does not give the selfrespect and happiness which come from useful activity. A disabled soldier has not been reconstructed until he has been made into a capable, self-supporting worker.

It was in France that the need of social reconstruction for the war cripple was first apparent and the means for accomplishing it first devised. An account of French reconstructive methods may therefore have some value at this time when the problem is beginning to crystallize in our country. They were the first to discover an answer to what they call the "problem of the *mutilés*" in trade training, or to use the rather clumsy Latin expression which has been as widely adopted as the principle—in "vocational reeducation," which in plain words is training which will enable a man to earn a decent

pupils and to the social and economic value of their work.

After the re-education movement had been under way for more than a year, and a large number of schools had sprung up to realize its aims, the government recognized the need of some central bureau which should coordinate all public and private activities for the best interests of the *mutilés*. Accordingly, an interministerial decree of March, 1916, signed by the Ministers of War, the Interior, and Labor, created a "National Office for Disabled and Discharged Soldiers." This office has done some excellent work in registering discharged soldiers and in investigating industries with a view to discovering all possible occupations suitable for disabled men. It also directs the efforts of the local committees which in each department are responsible for rehabilitating the men from their region. These committees are composed of representatives of the ministries of war and labor, of the departments of agriculture and technical instruction, of the medical service, of employers' associations, trade unions, and rural credit banks. Their duties are to see that every wounded soldier from the department receives the aid he needs; to which end they must keep in close touch with the men in hospitals, with the reeducation schools, and with the local employment bureaus.

The National Office has become a useful bureau of information on all matters connected with the reconstruction of disabled men, but it has had scarcely more than an advisory control over re-educational institutions. It has, however, examined the kind and amount of work they are doing and made recommendations to the government regarding subventions to be granted, and possible improvements which might be effected in the re-educational facilities of certain parts of the country. According to the program which it has drawn up, there should be in every part of France a "centre of readaptation," to which should be sent wounded men, native to that region, as soon as they are cured from the purely surgical standpoint. Each complete centre of readaptation should include (a) a hospital of physiotherapy, where the invalid receives "functional reeducation," or the treatment which will give him back the greatest possible use of his muscles; (b) an "apparatus centre," where artificial limbs and other appliances are manufactured and distributed; and (c) a centre of vocational reeducation.

At the present time there are in France twenty centres of physiotherapy to which reeducational schools have been annexed, but in only eleven of these are artificial limbs made and fitted. Model centres comprising the three activities are at Saint-Maurice, outside of Paris, Bordeaux, Lyon, and Montpellier.

The physiotherapeutic hospitals receive from the general hospitals for further treatment those men who have suffered so-called functional injuries. In order to reduce these functional injuries, they employ baths, massage, heat, electricity, radium, mechanotherapy, and other curative methods included in the general term, physiotherapy. The apparatus centres receive the amputation cases, subject them

to a thorough examination, and order and fit the needed appliances.

All appliances are furnished free of charge by the government, which is also responsible for their care and replacement during a man's lifetime. The man who has lost a leg receives as a temporary appliance a simple peg leg, and as a permanent one an articulated leg; both of which he can take with him on his discharge. The articulated legs furnished were at first of leather braced with steel uprights, but they were disliked by the *mutilés*, because of their weight, and now legs of the American type of hollowed wood are being more extensively manufactured and distributed. The man who has lost an arm receives a working arm of the type best suited to his needs, and in addition a show arm and hand of wood. Different models for working



FIG. 2.—Mechanical prosthesis for bench work in the metal trades.

arms have been invented at the different apparatus centres. Some are of the type called "universal pincers"; others are special devices for special trades; and others are improved models of the old fashioned ring and hook. No appliance can be given out at a government centre until it has secured the stamp of approval of the Orthopedic Commission appointed by the Minister of War.

Shops in which the government manufacture these appliances are manned in some cases by mobilized experts, and in others by disabled men learning the trade. If their product is insufficient for the demand, the government is empowered to requisition the output of private manufacturers and to insist on rigid standards of design, material, and workmanship.

After the foregoing brief survey of the machinery

which France has created for the reconstruction of her soldiers, it may be interesting to consider what answers can be found in French experience to certain questions which are bound to arise in any discussion of trade training for war cripples.

First, when should reeducation begin? On this subject, Doctor Carle, the first physician in chief of the schools of Lyon, makes some very definite statements. Pupils should be accepted by a school, he says, only when their wounds are completely cured, which means when they have either received their discharge from the army or, having been recommended for discharge, are awaiting final action by the pension board. It is important, he believes, that training once begun should be continued without interruption. There should therefore be no danger that the exertions of work will start up inflammations requiring further medical treatment, or en-

On the other hand two very successful schools organized by the *Union des colonies étrangères* have from the beginning drawn their pupils entirely from military hospitals; one from the hospital of physiotherapy installed by the French Medical Service in the *Grand Palais* at Paris, and the other from a depot for amputation cases at *Maison-Blanche*, Neuilly-sur-Marne. The directors of these schools consider that the fact that the men are still under military discipline contributes to the efficiency of the instruction. They have found, however, that many men fail to finish their training, as they leave both hospital and school when their cure is complete. The schools at Saint-Maurice and Bordeaux, and others now annexed to hospitals of physiotherapy or apparatus centres, receive as pupils both patients in the hospital and discharged soldiers. They, too, have experienced the difficulty of per-



FIG. 1.—French soldiers being trained to solder boots, on the same lines.

counter functional incapacities which might better be cured by physiotherapeutic methods. Serious apprenticeship to a trade does not, he says, permit a man to take regular functional treatment at the same time. Doctor Carle was, of course, anxious for the success of his schools and for that reason was particular to accept only pupils who could be expected to apply themselves earnestly to their work and to finish their course successfully.

The same conditions of admission were originally laid down by many other schools. Doctor Jeanbrau, the first head of the large vocational school at Montpellier, writes: "If we should accept as pupils men still in hospitals, they would lose a part of their mornings in dressings, massage, and electrical treatment. In an institution where regular and methodical work constitutes the essential factor of success, these invalids would be a perpetual source of disorder."

suading the pupils to continue their course after their discharge from hospital.

The trend of opinion in France has been more and more toward beginning vocational training as early as possible in the convalescent period. Some authorities have been led to this opinion by their belief in the curative power of useful work; others through their desire to induce a greater proportion of disabled to take up reeducation. While a man is still in the hospital, it is relatively easy to influence him to take up some form of training, but once he has returned to his family it is hard to place before him the arguments which might turn him to it and to counteract the demoralizing effects of idleness. In a report by Dr. Gourdon of the Bordeaux vocational school for war cripples, it is stated that when the school was first started and received only discharged soldiers, 80 per cent. of the men to whom it offered an opportunity for training refused

to avail themselves of it; whereas after the school was attached to the centres of physiotherapy and prosthetic apparatus in the city, the number of refusals was in two months reduced to 6 per cent. and at the present time is zero. To the same effect,



FIG. 4. A class in cabinet making for disabled men.

M. Chancrin, writing of the agricultural school at Grignon, reports that it was able to do really valuable service only after a centre of physiotherapy was installed in the vicinity. The government's policy since June, 1916, has been to make it possible for every man to start his training while he is being treated for functional disabilities or fitted for an artificial limb.

How should the work be carried on? In schools where pupils are lodged and boarded, in day schools, or by placing men as apprentices in private shops? In France the boarding school system, or the *Internat*, is generally considered to give the best results, and has been adopted in all the larger schools. The expense is not greater than for the day school, inasmuch as maintenance during the period of training must in any case be provided, and the psychological influences are much better. Disabled soldiers needing retraining are in the majority of cases deeply discouraged men, who readily fall a victim to the bad influences of the town. Even when pupils at a day school are housed by some aid society, in a special boarding house, they can not be kept under the same surveillance as at a boarding school. Their attendance at classes is likely to become irregular or to dwindle to nothing before their course is finished. Men who live with their families in the same town as the school, however, often make excellent records as day scholars.

When men are placed as apprentices with private employers, they encounter the same temptations in their living conditions as the pupils at a day school and are even less subject to good influence. Furthermore, they may not receive good instruction. It takes the exceptional employer or foreman so to arrange an apprentice's work that he will learn all the steps in a trade in a reasonable length of time. Too often an apprentice is considered simply as another hand, cheap labor, to be used for all he is worth.

In schools where the *Internat* arrangement is fol-

lowed, men who are still in hospital, or who have been discharged from the army and are drawing their pension, receive instruction, board, lodging, and usually clothing free of charge, nor is any deduction made from their pension. Almost all the schools also pay wages, varying from fifty centimes a day at the beginning to four or five francs a day. Often the proceeds, or, at least, the estimated value of the men's labor in a shop, are divided among them at the end of each month in proportion to their productive capacity, after a certain percentage has been deducted as the pupils' contribution to the running expenses of the shop. Or a part of their earnings may be kept back until they leave the school, when it is given to them as a lump sum to buy their tools or other necessary equipment. Pupils at day schools or those placed with private employers usually receive three francs fifty or four francs a day for their support from some one of the numerous aid societies for the *mutilés*. The cost per pupil per day in a boarding school is about five francs.

The third question—what trades should be taught?—has in France been largely decided by the fact that from sixty-five to seventy-five per cent. of the *mutilés* are from the villages and farms of the provinces. The importance of returning these men to their homes and of resisting rather than of encouraging the movement cityward has led most of the schools to teach the simple village trades of shoemaking, tailoring, carpentering, saddlery, and tin-smithing. Of these shoemaking is the most popular with the peasants; the shoemaking classes everywhere are so large that one wonders how the countryside will ever use so many cobblers. With a



FIG. 5.—One-legged learners of the shoemaking trade.

mastery of one of these trades, men who are convinced that their maimed or crippled condition will prevent them from wresting a livelihood from the land can still be independent in their native village. They can set up their shop in their own house and

use their spare time to raise a few vegetables or to cultivate a few grapes.

There are, however, many disabled *poilus*, both town and country bred, who believe that they are cut off from all manual work and who desire only to obtain an office position. They ask, therefore, for training which will fit them to become clerks, bookkeepers, stenographers, and typists. In every school directors have to use their influence to prevent too large a proportion of their applicants from attempting to enter this already overcrowded field. Men capable of other things should, it is believed, be replaced in industry, while clerical work should be reserved for those who would otherwise become dependent.

In all well planned reeducational work, before

been discontinued, although there is a demand for workmen in the trade to replace the Germans and Austrians formerly employed.

Some French schools find it difficult to retain their pupils more than six or eight months, and therefore make that the average length of course; others seem able to arouse such a spirit of ambition and perseverance among the men that they can easily induce their pupils to finish much longer courses. At the Ecole de Tourvielle the courses in shoemaking, fur work and horticulture last a year; those in tailoring, cabinetmaking, and the manufacture of artificial limbs, eighteen months. The aim of this school is to turn out thoroughly competent workmen who can compete with sound men on equal terms without claiming any indulgence from employers.



FIG. 6. Practical experience for French cripples in an agricultural course.

any trade is offered as an occupation for disabled men, there should be an investigation of the state of the industry. Not only should a trade be examined in respect to its suitability for men with reduced physical capacities, but as to the number of skilled workmen it can absorb, the standard of wages, the conditions of work, whether the work is seasonal or not, and whether the demand for labor will continue after the war. Trades which demand a long apprenticeship have been found to be unpopular with the men, who naturally wish to return to their homes as soon as possible. In fact, owing to the dearth of pupils, classes in tailoring—one of the trades which it takes a comparatively long time to learn—have in some French schools

At the government school at Saint-Maurice, where the apprenticeship is shorter, the aim is rather to make men capable of earning a living in a shop where they can complete their knowledge through practice, and so later aspire to higher pay. When men can be induced to finish the longer course, the more thorough training will certainly give them better assurances for the future.

In many of the larger schools a wide variety of trades is offered in order that every man who is obliged to take up a new occupation may find some work that suits his taste. For instance, in the school established by the municipality of Paris and the Department of the Seine there are courses in tailoring, shoemaking, carpentering, varnishing, typeset

ting, typefounding, binding, lithography, photogravure, moulding and stucco work, clockmaking, fur work, the manufacture of orthopedic appliances, industrial design (including designs for furniture, ironwork, architecture, and landscape gardening), bookkeeping, stenography and typewriting, English, and general schooling. At Bordeaux there are taught carpentry and cabinetmaking, lathe and band-saw work, cooperage, locksmithing, metal work and mechanics, basketry, brushmaking, binding, pottery, shoe and sabotmaking, saddlery, engraving, lithography, gardening, and the commercial courses.

On the other hand, schools situated in regions where there is a predominant local industry often specialize in the training which will meet the labor demands of the vicinity. At Oyonnax men are taught the different branches of the celluloid industry, so that they can go into the numerous factories making celluloid articles. In the national school of clockmaking at Cluses, near the Swiss border, large numbers of *mutilés* are becoming skilled clock and watchmakers.

It often happens that men who apply for training have no idea of what they want to do, and that the school must practically make the decision for them. In order to direct them wisely, French reeducation experts have worked out certain principles, which are valid, they believe, in the majority of cases. In the first place, any advice given a wounded man about the choice of a trade should be based on a careful examination of his physical and mental capacities. There should be considered not only the nature of his disability, but also his general health, his native intelligence, and his schooling. He should then be directed to some kind of work within his capacity, something in which his efficiency will not be seriously reduced by his handicap. This work should be if possible connected with his former trade, so that he can reap some advantage from his previous knowledge and experience. Even if the process is quite different, he can learn more easily if he is familiar with the materials or has handled similar tools. One French doctor has said that only a bartender or a saloonkeeper may be ruthlessly plucked from his former occupation. A mason or a plasterer, no longer able to mount ladders or scaffolds, should be placed in a position as foreman or estimator, where he can utilize his former knowledge of the trade. He can be fitted for such a position by some theoretical instruction and practice in figuring. A machinist can make some use of his former experience by learning draughting for machinery; a carpenter can become a cabinetmaker; a painter can change from building work to carriage or automobile body work.

French authorities do not believe that one can lay down any hard and fast rules as to what disabilities are compatible with the different trades. They have found that too much depends on the individual's determination and perseverance and on his natural ingenuity in adapting himself to his disability to make such a classification possible. In general, men who have lost one leg can take up almost any work which does not require continued standing, and for men who have lost both legs there are countless seated positions open. What men can do who have lost

an arm depends largely on the length of the stump. Dr. Amar, one of the foremost authorities in France on rehabilitating injured men, says that the loss of a hand rarely necessitates a change of occupation, nor does the loss of the forearm if the stump measures four centimetres from the bend of the elbow. In his experience, stonecarvers, bookbinders, mechanics, tailors, and printers, who have had one arm amputated below the elbow, have been able to take up their work again after a short course of reeducation. He also maintains that, given the right kind of reeducation and the proper prosthetic appliances, a man with a very short stump can be restored to considerable mechanical efficiency.

Dr. Bourrillon, who is head of the government



FIG. 7.—A French soldier equipped with "working prostheses" prepared to return to work on the farm.

school of Saint-Maurice, does not believe that a one armed man can become efficient enough in a manual trade to compete with normal workmen, and he is in favor, therefore, of training their intellectual capacities. The *manchots* at Saint-Maurice are consequently to be found largely in the book-keeping and stenography classes and in the section for industrial design. With the aid of a draughting machine made in the United States, a number of one armed men trained at Saint-Maurice have become efficient draughtsmen.

In the schools at Lyon, also, the majority of the one armed men are being trained for office posi-

tions, though there are a considerable number, barred from such work by a lack of schooling or intelligence, who are learning a trade in the bindery and the toy and paper box shops. At Montpellier one armed men are encouraged to enter the manual trades in preference to turning to office work. At this school, men with their right or left forearm amputated have been taught to do wood and metal lathe work or become tool setters, and men with ankylosed and paralyzed arms have learned tailoring and shoemaking. In the workshops for orthopedic appliances at Bordeaux, a man who has lost his arm below the elbow earns a normal wage as a filer; another whose arm has been disarticulated at the shoulder is running a band saw in the toy shop; and men with various kinds of arm amputations are learning the potter's trade.

Nowhere in France is the loss of a limb considered to be a bar to agricultural labor. Experiments have proved that men with one arm or one leg amputated, when fitted with a suitable working appliance, can do most of the ordinary work of a farm with fair speed and efficiency. Reeducation for agriculture of a man brought up on a farm often consists simply in demonstrating to him what a maimed man can do, and then giving him a few weeks' practice with his appliance. If he can once be persuaded to try to fit himself to his old life, the outdoor work and the familiar tasks soon restore his courage and cheerfulness, and it is then a simple matter for him to learn how to manage his artificial limb so as to do a good day's work.

A number of ingenious devices enabling men with amputations to do agricultural work are in use in France. Men with a leg amputation, who would be hindered by their wooden leg sinking into soft earth or plowed ground, find it convenient to use a leg turned with an enlarged end like an elephant's foot or to have a sabot which they can attach to the end of their peg. Men who have lost an arm need an appliance which will hold the handle of a farm tool and permit it to be turned freely in different planes and directions under the guidance of the other hand. They are obtaining good results from the Jullien tool holder, invented by a manufacturing orthopedist of Lyon, from a hook fastened to an oscillating ring, and from a simple arrangement of straps devised by two French doctors from photographs of an appliance used at Vienna. An excellent series of "hands" for different kinds of agricultural work have been invented by Dr. Boureau, of Tours. Among these are a hand for digging, a hand for cultivating the vine, one for driving animals, and one for managing the levers of agricultural machinery.

Agricultural reeducation is mainly carried on in the agricultural schools which existed before the war. These schools have found that after a short course of training, a maimed peasant can dig, hoe, reap, and follow a plow well enough to earn a living as a farm worker, but they try to persuade men to enter upon the longer courses which will open up to them better prospects. By taking courses in scientific farming—rotation of crops, stock feeding, dry fertilizing, farm bookkeeping, etc.—men can fit themselves to be farm managers or to hold other

executive positions. Or by specializing in some one branch of agriculture—truck gardening, poultry raising, fruit culture, or butter and cheesemaking—they can fit themselves for the kind of work in which they will not feel their injury as a handicap. Some agricultural schools teach in addition to the regular agricultural work basketmaking, carpentering, and cooperage, these being trades with which a farm worker can eke out his pay and pension during the winter.

Rural mechanics, or the use and repair of farm machinery, are taught in a number of schools, and it is probable that even greater emphasis will be laid on this work in the future. Even before the war the Minister of Agriculture was concerned about the growing shortage of labor and was taking steps to introduce machinery which would to an extent make up for the lack of men. In the present situation, when the war has made the lack of farm workers a great national peril, every effort is being made to rouse the French peasant from his old fashioned agricultural methods and to induce him to use modern machinery. A great many tractors are being imported from America, and it is necessary to teach men to run and repair them. This seems to be a good field for *mutilés*, as men who have lost a leg can do the work without inconvenience, and men who have lost a forearm can drive the machines provided their upper arm is strong enough to move the levers.

Disabled men who have taken a course of training are easily placed by the school in good positions. In fact the reports of the schools usually show that they have a great many more demands from employers than they can fill. But the overwhelming proportion of discharged soldiers who have not formed any connection with reeducational centres, unless they can go back to their old positions, are obliged to apply for work through private and public employment agencies. In order to facilitate the re-placing in industry of men discharged from the army, the Minister of War established a central Placement Bureau in Paris with branches in each of the twenty-one military régions of France. This placement service has since been merged with the "National Office for Disabled and Discharged Soldiers." The Minister of Labor, in a circular letter addressed to the prefects of departments, instructed them not to organize special placement bureaus for the *mutilés*, but to utilize and expand the existing departmental and municipal agencies. He objected to treating disabled soldiers as a special class of labor on the ground that that would mean treating them as an inferior class. The result of such a division would be, he feared, the concentration of disabled men in a small number of industries, their exploitation by employers, and difficulties with normal workmen.

In the early days of the war, before the official employment agencies were well organized, many disabled soldiers were placed in positions by the *l'Union nationale des mutilés*, but it is believed that in the future most of this work will be handled by the government.

All the benefits accorded to the *mutilés* are

effort to return men to their home districts, and when possible to their old trades. When they encounter cases impossible to place without retraining, they urge these men to enter a trade school. In the matter of wages there has been generally accepted the principle of equal pay for equal work.

A tendency on the part of employers to discriminate against disabled soldiers on account of the resulting increased cost of workmen's compensation has been overcome by a law passed November 25, 1916. This law provides that the additional compensation cost shall be met by a tax on industrial concerns and insurance companies. Since this tax is levied on all concerns regardless of whether they employ disabled men or not, there is no longer any reason for an employer to discriminate against war cripples on the ground of the greater insurance risk.

The United States Government has recognized its responsibility for the complete rehabilitation of the soldier and is making plans to provide trade training and employment opportunities for every man of the American military and naval forces who needs such help. The Surgeon-General's office intends to start the instruction in the large base hospitals, but the more specialized technical training necessary to turn out skilled workmen will be carried on as far as possible with the cooperation of existing educational institutions. It is probable that special classes for disabled soldiers will be organized under government control in many of the trade schools now in operation throughout the country.

The Red Cross Institute for Crippled and Disabled Men, established in New York through the generosity of Mr. Jeremiah Milbank, is making extensive studies in the subject of the disabled soldier's reconstruction for civil life. It has followed with interest everything that is being done in this field in France, and although it does not believe that all the theories and practice of the French schools can be applied to conditions in America, it is finding much inspiration in the achievements of our ally.

311 FOURTH AVENUE.

MEDICAL NEWS FROM WASHINGTON.

The Naval Appropriation Bill for Hospitals.—Food, Nutrition and Clothing Survey in the Army.—Decision as to Number of Doctors and Dentists for the Army.

WASHINGTON, April 30, 1918.

While the naval appropriation bill was under consideration before the House, an amendment providing for new hospital construction amounting to \$10,295,000 was agreed to. This sum was recommended by Surgeon General William C. Braisted, of the navy, for additional temporary hospitals and repairs at existing hospitals, and also for hospitals overseas, to cost about \$1,000,000.

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The Food and Nutrition Division of the Office of the Surgeon General of the Army is doing important work in connection with supervision of the whole subject of the use of food in the army, having as its object the safeguarding of the nutrition of the soldier and the economical use of food prod-

ucts. The supervision covers the storage of foods, the planning of the daily dietaries, the preparation, cooking, and serving of the food, the control of table and kitchen waste, and the satisfaction of the real nutritive requirements of the soldier. The work is performed at present by a corps of sixty-four commissioned officers, assisted by about fifty-five enlisted men. The force was obtained mostly from universities, medical colleges, hospital staffs, and agricultural experiment stations, and it consists largely of men selected on account of special fitness for the service.

The present method of operation is through survey parties, nine in number, which travel from cantonment to cantonment, making extended studies of conditions, disseminating information, and issuing recommendations to those in charge of the food and nutritional affairs of the encampment. The parties work in cooperation with the local camp authorities.

A survey of this kind includes quantitative chemical accountings for foods consumed and of edible and inedible waste; criticism of daily menus, inspection of storehouses, kitchens, and mess halls, and a record of the troop activities, clothing worn, and weather data covering the time occupied by the survey. The findings of the survey parties are rendered locally effective by reports to the division surgeon, by lectures, and by instruction offered to mess officers and cooks, both formally in schools arranged for their instruction and informally by information given on the spot by the inspecting officer during actual inspection.

* * * * *

The Secretary of War is expected within a few days to act on an opinion of the Judge Advocate General of the Army on the authorized enlisted strength of the regular army as affecting the number of medical and dental officers of that branch of the military establishment. While, in the meantime, the substance of the opinion has not been made known, it is understood that it will be satisfactory to the Medical Corps, although not in the form originally desired by the Surgeon General. It will fix a basis of strength that will insure a reasonable regulation of promotion and it will necessitate absorption of only a few colonels and lieutenant colonels that were commissioned on the basis of a strength that later was considered as larger than authorized by law.

In connection with the medical service, it may be stated that considerable interest attaches to the stories that have been brought back from France, mostly by civilians that have been engaged in voluntary medical and sanitary work, to the effect that the Medical Department abroad has "collapsed," and that there is very much in the situation there in respect to administration of hospitals and the care of sick and wounded to invoke anxiety as to the welfare of the disabled. None of these reports is sustained in the official advices received from representatives of the Medical Department serving under General Pershing, and one explanation of the criticisms is that their authors have assumed this unfriendly attitude because it has not been possible to comply with all their requests for personal favor.

Editorial Notes and Comments

NEW YORK MEDICAL JOURNAL

INCORPORATING THE

Philadelphia Medical Journal and the Medical News

A Weekly Review of Medicine

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NEW YORK, SATURDAY, MAY 4, 1918.

THE MAYOR OF NEW YORK AND THE HEALTH DEPARTMENT.

*"I do not give a darn for these Federal Gov-
ernmental letters or letters from other people who
are interested in public health education. As long
as I am Mayor of the City of New York the
Health Department will be run as I see fit."
Mayor Hylan.*

The mayor of the City of New York, when con-
fronted by Dr. J. Lewis Amster, the commissioner
of health, with the suggestion that if the present
chaos in the Department of Health continued the
Federal Government might intervene, gave the reply
quoted above. Doctor Amster at once resigned the
commissionership in a letter which set forth at some
length the causes which prompted his resignation.
These are numerous, definite, and entirely adequate
to cause any self respecting official to tender his
resignation. The office came to Doctor Amster
unsought, and with the distinct understanding that
he would be unhampered in its administration. In
his letter of resignation, Doctor Amster specifies,
among other things, the following reasons for his
resignation: The appointment of the family physi-
cian of the mayor as secretary of the Board of

Health, though he proved incompetent; the demand
of the mayor to remove Doctor Abraham Jacobi
from the medical advisory board because his son-in-
law was connected with the *New York Times* which
had criticized the mayor, and to remove Dr. S. S.
Goldwater because he had been a pet of the previous
administration; failure of the mayor to make
necessary appointments requested by the commis-
sioner; his instructions to abolish the baby health
stations; his failure to approve the recommendation
for an appropriation to carry on the work of the
antitoxin laboratory; his failure to take steps recom-
mended by the commissioner for the removal of ac-
cumulations of filth in the streets; his insistence on
the removal of bureau heads by the commissioner
without adequate cause; his action in turning over
the Otisville sanatorium to the Government without
even informing the commissioner, and his dictatorial
suggestions interfering with the details of adminis-
trative work of the Health Department.

Accompanying this letter of resignation Doctor
Amster sent a letter to the mayor formulating his
objections to the abolition of the Bureau of Public
Health Education, and accentuating the fact that
at this particular time—a time of war—when thou-
sands of physicians and nurses had been withdrawn
from private practice and when many wounded and
invalided soldiers were likely to be returned, it was
exceedingly important that the public health educa-
tion be carried on with even increased vigor. Doctor
Amster had signed the preliminary report recom-
mending the abolition of this bureau. He reconsid-
ered that action and announced himself as firmly of
the opinion that it would be a serious menace not
only to the people of New York, but to the whole
country.

The mayor accepted the resignation and at once
appointed in his stead Dr. Royal S. Copeland, pro-
fessor of ophthalmology and for the past ten years
dean of the faculty of the New York Homeopathic
Medical College. Doctor Copeland has stated that
the mayor promised that there would be no inter-
ference in his power over the Health Department
and said "If there is, I shall resign at once. I may
be out of office tomorrow for all that I know."

The controversy concerning the changes in the
Health Department of the City of New York, pro-
posed by Mayor Hylan, have during the past week
taken on a national significance. Surgeon General
Blue, of the United States Public Health Service,
telegraphed to the mayor urging him not to curtail
the activities of the Health Department in informing
the public concerning diseases and its prevention.

Doctor Charles H. Mayo, president of the American Medical Association, has addressed a letter to the mayor asserting that the proposed abolition of the Bureau of Public Health Education would be "a catastrophe at any time, but especially now, when, more than ever before, it is necessary to safeguard and maintain the health of the citizens of the United States." In the course of this letter Doctor Mayo pointed out the national importance of this work. Advices from Washington intimate that if the Overman bill becomes law, and it has now passed the Senate, President Wilson may appoint a Federal Health Administrator who, under the law, would have authority to step in and take charge in the City of New York if the disorganization of the work of this board seems imminent.

The organized medical profession of the city and indeed of the United States at large has unequivocally denounced the proposal of the mayor to do away with the Bureau of Public Health Education. In this attitude it has received the support of all kinds of civic bodies including representatives of many labor organizations. We feel confident that this storm of protest will have the desired effect, if for no other reason than a political one. The political sponsors of Mayor Hylan must realize soon, if they have not already done so, that the course which he is pursuing in this particular matter is distinctly bad politics, bringing as it does the mayor and his party into disrepute with the great mass of the voters of New York City.

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THE PREVENTION OF THIRST AT SEA.

How many of us remember when as boys we stretched out on the floor, poring over a story of castaways at sea, the terrible thirst which parched their lips, the temptation to assuage it with sea water, the yielding of one sailor to this temptation, his death in horrible agony?—we read of these thrilling events until our own mouths became dry and we rushed to the nearest faucet for a long drink of water.

While these books are still being written and read, doubtless, by an ever-changing audience of boys, they have long ago lost their glamour for us adults. With the increasing safety of ocean travel, we are not able to swallow the inevitable shipwreck, the boat load of survivors, and the torments of thirst. But in the last few years a new terror has been added to sea travel—the submarine. Boat loads of castaways are no longer a conventional stage property of the shilling shocker, but a familiar item in the daily press. And, while it is true that most of these unfortunates are soon picked up, distressing instances

of deprivations, suffering, and even death do occur. Can these be prevented? Is there any way by which the vast quantities of water all about can be used?

"Water, water everywhere, but not a drop to drink," said Coleridge many years ago. When sea water is actually drunk it sets up severe peristalsis, locks up the pylorus in a tonic spasm such as occurs in acute abdominal cases, and hence is not absorbed.

For some years Dr. Morley Roberts, of England, has sponsored a theory that the sufferings of castaways at sea can be obviated by the rectal injection of sea water. Following out this theory a Mr. R. Graham, in 1916, on a sea voyage went without drinking for five days, during which time he injected daily two gallons of pure sea water; on the fourth and fifth day he washed his mouth out with ordinary water. He did not feel thirsty until the sixth day, when he took half a tumbler of water, although he was only slightly thirsty. On the seventh day he had one and a half glasses of water, although he felt he could have gotten along without it; he resumed his normal life on the eighth day. His general health was very good during this whole time and he had no tendency to diarrhea.

Doctor Roberts suggests therefore that a rectal syringe be made part of every lifeboat's equipment, and he believed that by using sea water in this manner these maritime tragedies could be avoided. Certainly this theory is worth investigation, and, if it offers any possibility of ameliorating even to a slight extent the sufferings of the victims of the U boats, it should be put into practice.

—

THE LAW OF DIRECT HEREDITY.

This law, were it but ideal, would result in an absolute equilibrium of the integral resemblance of the father and mother in the physical and moral nature of the offspring. But there is no law in nature that is unconditional and, therefore, the law of direct heredity is never complete in its manifestations.

The conditions requisite to completely realize it are, in the first place, a perfect physical and mental constitution of the parents. If one reflects a little, it will become obvious that these two general states themselves are the result of a large number of particular states which, taken all together, impress upon each individual that special and distinctive mark that in physiology is called temperament and, in psychology, character.

But it is not enough that these two primary conditions are fulfilled; more is required than that the physical and mental constitutions of the parents are in equilibrium. There are other conditions resulting from age and health which are essential. A disproportion between the ages of the parents, when sterility does not result, results in a preponderance of the younger. The experiments of Girou de Buzareingues on various animals show that the product of an old male and a young female resemble all the less to the father the more decrepit he is and the mother more vigorous. The actual state of health at the time of conception in either parent has a no lesser influence on the nature of the product.

There are other accidental and transitory states under whose influence the act of generation is governed to a considerable extent. Positive facts show that these states, no matter how transitory, have the greatest influence on the nature of the being procreated and assures the preponderance of one or the other sex. We would here simply recall that nothing is less uncommon than intellectual weakness in offspring engendered during alcoholic intoxication, and that history shows to some extent that illegitimate children are better endowed in brains, health, and beauty than the legitimate ones because the former are procreated in the passion of love.

On the contrary, when the parents have an aversion to each other they produce disagreeable products and the offspring are lively and intelligent.

To these conditions are to be added a series of influences manifesting themselves during pregnancy, such, for example, as psychic influences whose action on the evolution of gestation is generally accepted.

Moral shock and violent emotions produce perturbations in cell life that are well known. The chemism of our cells is modified and toxic products result from their abnormal functioning which impregnates the parental organism, and thus may have an unfortunate action on the descendants, and what is more, as Féré pointed out, under the influence of violent emotions and particularly fright, a profound depression results and often convulsive phenomena which may cause a *convulsive habit* in the fetus.

It is certain that children conceived during political perturbation occasionally present a peculiar morbid state, and the present general upheaval of almost the entire world should, in this respect, unfortunately offer in years to come the truth of this statement.

WHAT IS PHYSICAL TRAINING?

The directors of college athletics assembled in annual session made declaration to the effect that athletics in their institutions should be carried on as usual during the war, and at once the newspapers appear with black headlines (it is to be noted that the matter is usually on the sporting page) to this effect, as if the conclusion were one of the weightiest moment. A director of our largest normal school for teachers of "physical training" is, in the same week, interviewed, and makes the statement, published with smaller headlines, that college athletics as conducted in most schools have been the most serious hindrance to the physical development of our young manhood. Here are statements radically opposed to each other. Wherein lies the truth?

Directors of college athletics live by coaching the best men of their schools to beat some or all of the best men of other schools with which they come in competition. They make a mighty good living by the business, and the better living, the more games their teams win. The men who are given all or most attention need little physical training, and, in many cases, would be the better for physical repression and more mental stimulus. Is the decision of such a body of men to be received (except by the interested sport) as unbiased or as of much value to the community at large? Doctor Sargent is not an athletic coach, though he is head of the Harvard gymnasium; he does not make his living by putting the finishing touches on the best athletes that have come up from secondary schools, but does the best he can in the way of inducing the average college student to exercise. He also turns out from his normal school of gymnastics a goodly number of young men and women having some knowledge of hygiene and of the various means of administering formal muscular exercise to pupils of all ages from the kindergarten up. He would seem to have a wider view of the physical educational field than the mere athletic coach.

It might be said that an attempt is being made in many colleges to correct the evil that Sargent preaches against by having all students take part in athletics intramural if not intercollegiate. Be this as it may, our colleges enroll but a small proportion of the young men and women of the land, and, while it is well to look after their physical welfare in an adequate way, and not to coach a small minority for the entertainment of the cigarette sucking majority on the bleachers, the whole college group offers but a small health

problem by comparison. Besides, by college age, physical development is well nigh complete.

A far more important matter to the nation is the physical condition of the great majority of our developing young people beginning with (or before) birth. The whole matter of physical education, as it is called, needs (what it has never had) a thorough investigation from an unbiased and scientific point of view. The public deserves to know whether the large sums paid out for teachers of "physical education" are paid to good purpose. We have had "physical training" in many of our public schools for a quarter of a century. Are the children from these schools reasonably well developed and relatively free from postural deformity? Can fifteen minutes of arm and leg stretching counteract the five hours' confinement and (in cities) a lack of opportunity for abundant exercise out of doors. Or is exercise in any amount of use where the nutrition and home surroundings are not adequate? Can a plant be made to grow straight and lusty by propping, if its soil is poor and its sunshine limited? And since when did a well nourished child need to be urged to exercise or to be instructed in the art of play? An investigation along these lines would surely lead afiel into the territory of education in general, which is carried on with too little regard to the material it works upon, and with practically no regard to classification of the material.

The teacher of "physical education," so called, in our public schools is undoubtedly most conscientious in his work, but does muscular exercise lie at the basis of physique? The general educator has responded with a "Yes! Yes!" to agitation in regard to the bodily needs of his pupils, but has he not afterward simply turned over on the other side and dozed off again?

THE MENTALLY DEFECTIVE SOLDIER.

For the first time in the history of warfare mental hygiene, as practised among the soldiers, has been given the prominence it deserved, and, profiting by the experience of England and France in the present war the Surgeon General was impelled to inaugurate an elaborate organization, both in numbers and in plan, to take care of any mental disturbances detected in the camps or among soldiers during the war. This is a distinct innovation in medical army work, for the subjects of mental hygiene and of mental and nervous disease in general as occurring among soldiers in war time were for many reasons either slightly treated, or neglected altogether.

The outlook for those affected mentally during the war is rather brighter than among those in civil life, and Lieutenant Colonel Pearce Bailey (*American Journal of Public Health*, January, 1918) finds the rate of recovery varying up to seventy per cent. (Doctor White's statistics of the Spanish war), as contrasted with the twenty per cent. or twenty-five per cent. as found among the civilians. During peace the discharge rate from the army of those affected with various psychoses is three men in a thousand, as compared with six or even ten in a thousand during the war, especially in expeditionary wars, that is, wars in foreign countries, when the ratio rises as high as fifty per thousand, as happened in the German expeditionary forces in the Boxer campaign. Here evidently homesickness is an important contributory factor. Insanity is the most frequent cause for discharge in the army, even more so than tuberculosis, contrary to the accepted belief.

The mental hygiene work is conducted by a staff of qualified men, who responded eagerly to Surgeon General Gorgas's appeal for specialists issued in April and May of last year. Among the cases they handle are, first of all, the mental defectives, whose conduct in the army may easily be compared to the behavior of backward and feeble-minded children in school. Their mentality is passed upon by new and rapid tests specially adapted to the urgency of the situation. The weeding out of these "stupid" is a matter of great importance in the morale of the army during war, for many a case of apparent cowardice, for which the unfortunate forfeits his life, is to be ascribed to feeble-mindedness, as the English have found in their experience during this war. Another class is the pampered son and the ne'er-do-well, subjects without stamina or basis of character or mind; the presence of such is of no value in an army, and, once found, they should be gotten rid of. Still another type is the individual who cannot possibly be made to fit within the rigid frame of the collective discipline of an army: divorced from his habitual way of doing things, unable to orient himself among the new surroundings for lack of adaptability, he soon collapses under the strain and excitement of war horrors, and thus becomes a burden on the army. It is especially important to keep in mind that all such may pass a perfect physical examination, as presumably very desirable soldiers, and this notwithstanding may be properly classified among the above enumerated cases. Even in the officers' training camps, where are gathered some of the finest specimens of young manhood, among candidates combining the two most important

qualifications of the successful soldier, the ability to obey and the quality of initiative and independence whenever the occasion demands, there are between one per cent. to two per cent. nervously unfit for war.

Who will gainsay that we will have a very wide field indeed to work upon!

JOHN McCRAE.

There have been many obituaries of John McCrae dealing with his pleasant boyish resourcefulness, his good studentship, his conscientious teaching, and his splendid self forgetfulness as a soldier in South Africa and in Europe. The doctors claim him for their own; the military world cries, "A doctor, yes, but a soldier, too," and the poets, now writing in blood their grief at this world's overturning, say, "He is ours," as they point to the two now famous poems *In Flanders Fields* and *The Anxious Dead*, which have gone out into all lands, now settling in journal, now taking flight into a newspaper, now quoted in pulpits, at banquets, or in novels. But one mistake is made by those who say, "We shall never see his like again," for already his eager ghost is reincarnate in the soldier doctors he left behind, and none rejoice more in their unconquerable, faithful devotion than John McCrae.

His life work, briefly summarized, is that he honored the world by coming into it in 1872 at Guelph, Ontario, as a son of Colonel and Mrs. McCrae. Toronto University gave him his arts degree in 1894, and that for medicine in 1898. Toronto General Hospital and the Johns Hopkins Hospital received him gladly as a worker, while to Professor Adams he became an enthusiastic colleague as professor of pathology in McGill University, and in Montreal he chiefly labored until 1900, when he served the Queen in the Boer War both as officer and medical officer, winning the Queen's medal. When war broke out in 1914 he was in London, and wired to Canada his wish to serve, getting appointed to the Canadian artillery. Two years of intensely hard work induced him to become an internist in the base hospital of the McGill Unit, but news of his appointment as consultant to one of the British Areas came on the very day he was taken ill with pneumonia and he died the third day.

IN FLANDERS FIELDS.

In Flanders fields the poppies grow
Between the crosses, row by row.

That mark our place, and in the sky
The larks, still bravely singing, fly.
Scarce heard amid the drums below.

We are the dead: short days ago
We lived, felt dawn, saw sunset glow,
Loved and were loved, and now we lie
In Flanders fields.

Take up our quarrel with the foe!
To you from failing hands we throw
The torch; be yours to hold it high!

If ye break faith with us who die
We shall not sleep, though poppies grow
In Flanders fields.

CALLED TO THE COLORS.

Dr. Matthias L. Foster, for the past twenty-one years an assistant editor of the *NEW YORK MEDICAL JOURNAL* and for some years past a member of the Medical Reserve Corps of the United States Army, has been assigned to active service and ordered to the Army General Hospital, at Fort McHenry, Maryland. Doctor Foster is one of the leaders in his special field of work, ophthalmology, and will prove a most valuable officer. While we regret exceedingly that we shall be temporarily deprived of his services as an assistant editor, it affords us much pleasure to think that we can, in a measure do something toward the great cause. Doctor Foster has been granted a leave of absence from his duties on the *NEW YORK MEDICAL JOURNAL* and will be welcomed back to the staff when relieved from active duty in the army.

News Items.

Changes of Address.—I. T. D. (Boston) to 775 Brimmer Avenue, Boston.

Fire on Doctor Morris's Estate.—A woodland fire on the estate of Dr. Robert T. Morris, Greenwich, Conn., recently destroyed a number of valuable fruit trees. The loss is estimated at \$50,000.

Tufts Dental School Destroyed.—A fire recently destroyed the Tufts Dental School, Boston, in which the loss was estimated at \$50,000. The authorities state that the school work will be carried on in temporary quarters until the close of this term.

Personal.—Dr. Charles Greene Cumston, of Geneva, Switzerland, for many years an assistant editor of the *NEW YORK MEDICAL JOURNAL*, has been elected president of the Section in History of Medicine of the Royal Society of Medicine, London.

Special Ophthalmic Training.—A special course of training in ophthalmic treatment and nursing will be given by the New York Ophthalmic Hospital to fit students for war service. The hospital will also give special care to any soldiers or sailors who are disabled or wounded who receive injuries of the eye.

American Proctologic Society Cancels Meeting.—There will be no annual meeting of the American Proctologic Society this year, and all plans for the meeting which was to have been held in Chicago on June 10th and 11th have been canceled. It is probable that the society will not meet again until the war is over.

The Body of Colonel Reno.—Lieutenant Colonel William W. Reno, M. C., U. S. Army, was returning from France as an invalid on the *Susquehanna*, when he disappeared from the ship. Nearly a month later his body was picked up and the *United States Marine Corps* has been ordered to Cleveland, Ohio, for burial.

Army Vice Campaign in New York City.—Captain Timothy N. Pfeiffer has recently made a preliminary survey of the metropolitan district of New York as regards vice conditions and has established cordial relations between the New York police authorities and the federal agents assigned to the New York District. These authorities, in connection with the Commission on Training Camp Activities, have wiped out all the unwholesome conditions in the military zones near New York. The city authorities are giving the commission their most cordial support.

Trench Bags for the Wounded.—The Department of Military Affairs of the American Red Cross in France reports that during the past month the first lot of trench

bags for the wounded when it is impossible to get them out of the trenches and where they may have to remain for hours without any help or food. They contain the following articles: Cocoa, coffee, chocolate, safety pins, scissors, electric torch, chewing gum, cigarettes, canlles, matches, condensed soups, condensed milk, insect powder, feeding aprons, a tommy cooker, and Greely hypodermic units. There will be one bag for every twenty men.

Meetings of Medical Societies to Be Held in May.—American Gastroenterological Association, Atlantic City, May 6th-7th; American Gynecological Society, Philadelphia, May 16th-18th; Arkansas Medical Society, Jonesboro, May 7th-9th; Association of American Physicians, Atlantic City, May 7th-8th; Connecticut State Medical Society, Hartford, May 15th-16th; Kansas Medical Society, Kansas City, May 1st-3d; Michigan State Medical Society, Battle Creek, May 7th-9th; Mississippi State Medical Association, Jackson, May 14th-15th; Missouri State Medical Association, Jefferson City, May 6th-8th; Nebraska State Medical Association, Omaha, May 7th-9th; Oklahoma State Medical Association, Tulsa, May 14th-16th; Iowa State Medical Society, Fort Dodge, May 8th-10th.

State Civil Service Examinations.—Among the positions for which examinations will be held on May 25th by the New York State Civil Service Commission are the following:

Medical Expert on Tuberculosis, State Department of Health, \$3,200. Open to men and women physicians of at least five years' standing and licensed to practice medicine in New York State.
Technical Assistant, State Department of Health, \$220 to \$1,200. Open to men only between the ages of 21 and 35 years.

Director of Laboratory, Department of Health Officer, Port of New York, Rosebank, Staten Island, N. Y. \$3,500.

Assistant Medical Officer, Department of the Health Officer of the Port of New York. Men only. \$1,500. This position is in the Detention and Hospital Service of the Quarantine Station and involves residence service at either of the quarantine islands in Lower New York Bay.

Assistant Physician, regular or homeopathic. Salary in the State hospitals, \$1,200, increasing \$100 each year to \$1,600.

For application form address a postal card to State Civil Service Commission, Albany, N. Y.

Meetings of Medical Societies to Be Held in New York during the Coming Week.—Monday, May 6th, Medical Society of the New York Polyclinic Medical School and Hospital, New York German Medical Society, Brooklyn Hospital Club; Tuesday, May 7th, New York Academy of Medicine (Section in Dermatology and Syphilis), Clinical Society of Harlem Hospital, New York Neurological Society, Society of Alumni of Lebanon Hospital; Wednesday, May 8th, Medical Society of the Borough of the Bronx, New York Pathological Society, New York Surgical Society, Alumni Association of Norwegian Hospital; Thursday, May 9th, New York Academy of Medicine (Section in Pediatrics), West End Clinical Society, Brooklyn Pathological Society (annual); Friday, May 10th, New York Academy of Medicine (Section in Otolaryngology), Clinical Society of the German Hospital and Dispensary, Eastern Medical Society of the City of New York, Flatbush Medical Society (annual); Saturday, May 11th, Medical Officers' Reserve Corps Association of the United States Army, New York Division.

The Chicago Meeting of the A. M. A.—The sixty-ninth annual meeting of the American Medical Association will be held in Chicago, June 10 to 14, 1918, with general headquarters at Hotel Sherman, North Clark and West Randolph Streets. The executive committee is composed of the following members: Dr. Ludwig Hektoen, chairman; Dr. Charles J. Whalen, secretary; Dr. William A. Pusey, treasurer; Dr. John V. Fowler, Dr. Hugh T. Patrick, Dr. Malcolm L. Harris, Dr. Frank Billings, Dr. James B. Herrick, and Dr. Charles E. Humiston. The local committee of arrangements, with headquarters at 25 East Washington Street, is actively engaged in perfecting plans for the comfort and entertainment of the members of the association and their guests. The chairman of the subcommittee on clinics, Dr. Charles F. Humiston, announces that there will be five days of clinics in connection with the meeting, beginning Thursday, June 6th, and continuing up to Tuesday, June 11th. The Section in Miscellaneous Topics, with Major Frank Billings as chairman, will consider the reeducation and rehabilitation of disabled soldiers. A complete program will be given later. On Wednesday evening, June 12th, there will be a general meeting at which men who have been active in the medical military service of the United States will take part, and Thursday evening will be devoted to a patriotic meeting which will be addressed by men prominent in public affairs. Tentative arrangements have been made for the meeting places of the various sections and the scientific and commercial exhibits. All correspondence with the local committee of arrangements or any of its subcommittees should be addressed to 25 East Washington Street, Chicago.

Casualties in the U. S. Army.—The total number of deaths in the U. S. Army from April 6, 1917, to March 14, 1918, from all causes is reported to be 1,191. Of this number, 132 were killed in action, and 237 died or were lost at sea. The total number wounded in action was 404. Thirty-five men were reported as missing, 28 of them said to be captured.

Meetings of Medical Societies to Be Held in Philadelphia during the Coming Week.—Monday, May 6th, Blockley Medical Society, Clinical Association, Wills Hospital Ophthalmic Society; Tuesday, May 8th, County Medical Society; Thursday, May 9th, Pathological Society; Friday, May 10th, Atlantic County Medical Society, Northern Medical Association.

Civil Service Examination for Pathological Chemist.—The Municipal Civil Service Commission announces an examination for pathological chemist, for which applications will be received until May 14th, at 4 p. m. Candidates must be at least twenty-one years of age and have the degree of M. D., Ph. D., or M. S. Full particulars may be obtained from the office of the commission, Room 1410, Municipal Building, New York.

Increased Number of Pneumonia Cases in the East Side.—The authorities of the Henry Street Settlement announced recently that the increase of pneumonia cases during the month of March has created a record number of calls upon its nursing staff. During that month 30,450 visits were made, an increase of about 5,000 visits over March, 1917. One thousand and fifty cases of pneumonia were reported, the deaths rising from 8.7 in 1917 to 12.3 per thousand in 1918. Notwithstanding an increase in the number of nurses, the work has been so onerous that many nurses have been made ill by the strain.

Additional Hospital Facilities for the Navy.—The naval appropriation bills provide for the expenditure of \$10,295,000 for constructing temporary hospitals and repairing the existing ones. The largest single item is for \$1,400,000 for the Naval Hospital in Brooklyn. Improvements will be made to the hospitals at Chelsea, Mass.; Newport, R. I.; New London, Conn.; Brooklyn, Ward's Island, Pelham, N. Y.; Philadelphia, League Island; Norfolk; Hampton Roads; Charleston, S. C.; Paris Island, S. C.; Great Lakes, Ill., and Pearl Harbor, Hawaii. The purchase of 420 acres of land adjoining the Naval Tuberculosis Hospital at Las Animas, Colo., because of increased demands, is planned.

A New Health Commissioner Appointed.—Dr. J. Lewis Amster has resigned his post as Health Commissioner of the City of New York, and Dr. Royal S. Copeland, dean of the Homeopathic Medical College for the past ten years and professor of ophthalmology in that institution, has been appointed to succeed him. The new commission has made public a letter received from James E. McBride, chairman of the Civil Service Commission, in which he attacks Lucius P. Brown, director of the Bureau of Food and Drugs, intimating that he has been influenced in favor of the Borden Milk Company. He also intimates that Mr. Brown has been unduly favorable to the house of Schieffelin & Co., the head of which, Dr. W. J. Schieffelin, president of the Citizens' Union, examined Mr. Brown for the Civil Service Commission. In the letter Mr. McBride charges Doctor Bolduan with having used the Bureau of Public Health to promote the Staten Island garbage grab, and of having spent large sums in conducting a prohibition campaign. During the course of an investigation being carried on by the Public Service Commission, Dr. Robert J. Wilson, head of the Bureau of Hospitals, certified that an employee was working in one hospital when he was, as a matter of fact, working for another. Doctor Wilson explained that he had tried for ten years to get the pay rolls made out in a more flexible form, so that an employee would appear on it as being employed to perform a certain service rather than being employed in a certain institution, since the character of the service was not likely to change, while the employee might be detached from one institution and transferred to another from time to time, as the exigencies of the service demanded. An assistant district attorney states that he has presented evidence to the grand jury charging the existence of graft in the Health Department.

Modern Treatment and Preventive Medicine

A Compendium of Therapeutics and Prophylaxis, Original and Adapted

THE TREATMENT OF HEMOPHILIA.

BY LOUIS T. DE M. SAJOUS, B. S., M. D.,
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(Continued from page 804.)

Welch in serum treatment collects blood from a vein by suction into a small flask and allows the blood to clot in a slanting position in it, then withdrawing the serum for use. In infants he uses at least ten mils of serum, given subcutaneously and repeated three times a day or every two hours, according to the severity of the case. In a series of nine babies with melena thus treated all recovered but one, and the latter did not succumb to hemorrhage.

Defibrinated human blood, prepared by whipping blood vigorously with a rod while it is clotting, and which comprises the red and white blood cells in addition to the serum, has been substituted by some for serum in hemophilia and in hemorrhagic purpura. From the standpoint of coagulation, defibrinated blood is probably but little, if at all, superior to serum alone, though the presence of the leucocytes in addition might conceivably increase the available coagulating ferment introduced. Against this supposition, however, is the fact in defibrinated blood clotting has already taken place, and the leucocytes have therefore already given off most, if not all, of the coagulating principle or principles they are capable of supplying. Moss and Gelien, 1911, employed defibrinated blood with an additional end in view, administering large injections—200 to 320 mils—of such blood from a case of polycythemia intravenously in a patient with hemorrhagic purpura and typhoid fever, in the hope that the added erythrocytes might relieve the existing severe anemia. Blood counts seemed to indicate that the desired auxiliary effect, in addition to arrest of bleeding, had been realized, and the patient recovered. Rather severe reactions followed the large intravenous injections. As Moss and Gelien point out, only human blood should be used in such a procedure, as red cells from one species do not functionate in another species, and probably would be quickly hemolyzed and cause toxic symptoms. On the whole, from the standpoint of coagulation and in cases not already in a dangerous condition from loss of blood, defibrinated blood does not appear to possess any decided advantage over fresh serum alone.

A related measure which has been resorted to is the transfusion of human blood. What are the relative merits of these procedures? Duke, 1910, referring in particular to uncontrollable bleeding due to diminished number or absence of blood platelets, advocated transfusion as the best means of making good the deficit, and reported cases illustrating the benefits. But, as already pointed out, the number of platelets in true hemophilia is approximately normal, and, according to the researches of Minot and Lee, the defect in the platelets in hemophilia consists merely in a slow availability of these bodies for the

purposes of coagulation. Moss and Gelien, 1911, believing it probable that it is the products set free upon disintegration of the platelets during extravasation of blood which contribute toward the checking of hemorrhage, rather than the platelets *per se*—a supposition confirmed by the studies of Minot and Lee, and of others—state that these products are doubtless furnished just as well in serum or defibrinated blood as in whole blood. Hence, apparently, these measures are practically equivalent as regards assisting coagulation, readily available (normal) platelets or their disintegration products being supplied in all three.

From the standpoint of recorded clinical observations the effects of whole blood transfusion seem to have been slightly superior to those of the other two procedures, especially the serum injections. Several cases have been reported in which, after fresh serum injections had completely failed or proven insufficient, blood transfusion brought about immediate cessation of hemorrhage. In such instances, however, the preparatory effect of the serum preceding the whole blood is to be considered, and likewise the fact that in serum injections often a less amount of serum is given than the quantity of blood administered in whole blood transfusion. Again, according to Nolf's views on the nature of coagulation, some of the thrombin present is used up through combination with fibrinogen in the formation of fibrin. Unclothed blood might thus be inferred to contain a larger ratio of thrombin yielding material than exists in serum or defibrinated blood, a portion of this material having been used up and eliminated from these preparations through fibrin production and the removal of the clot.

That blood transfusion in sufficient volume may exert a marked and immediate influence on the coagulation time in true hemophilia is shown in a case recorded by Minot and Lee in which, after removal of 500 mils of blood from the patient, 600 mils were transfused from a healthy donor. Whereas before the procedure the patient's blood clotted only after 150 minutes, directly after the transfusion it coagulated in normal time, i. e., seven minutes, as it did also six hours later. Thereafter the clotting time gradually lengthened again to sixty minutes three days, and 100 minutes five days, after the transfusion. Three days being generally considered the duration of life of platelets in the blood stream, Minot and Lee took upon the *Archives of Internal Medicine* the clotting time in this case as evidence in support of their view that the platelets are of prime importance in coagulation. F. C. Allen, 1913, reported the case of a boy of twelve with continued oozing of blood from the mouth, coma, and hemoglobin estimated as low as four per cent., in which transfusion of only a small amount of serum blood was promptly followed by cessation of hemorrhage, and apparently reversed the condition from a lethal trend toward eventual recovery.

On the whole, blood transfusion in comparison

with serum administration, may perhaps be held especially indicated in the more severe cases, though the circumstances attending the individual case, such as the availability of a suitable donor or of an animal from which fresh serum could be obtained, the experience of the practitioner with blood transfusion, etc., might easily outweigh other considerations. Like defibrinated blood, transfused whole blood has over serum alone the advantage of supplying additional erythrocytes to patients already seriously anaemic from blood loss. On the other hand, as indicated in the case treated by Minot, the favorable effect of transfusion on the coagulability of the blood cannot be expected to persist longer than that of defibrinated blood or serum.

Various attempts to supply, without actual introduction of normal blood or serum, organic coagulating principle or principles lacking in the blood of hemophiliacs have been made. In general, these attempts have been based on the view that deficiency of thrombokinetic substance is an important factor in the hemophilic state. Gubb, 1908, sought to increase coagulability by oral administration of the juice of raw meat, and reported a case of hemophilia with joint hemorrhage and hematuria, in a boy of eighteen, in which the taking of meat juice was followed in ten hours by cessation of hematuria. The symptom reappeared when the meat juice was discontinued, but passed off again when it was resumed. Complete recovery ensued after a month's treatment. According to Howell, 1913, the active thromboplastic substance of the tissues is a combination of protein with a phosphatid extracted from the tissues by ether and known as kephalin. Hurwitz and Lucas, 1916, gave a hemophilic patient 0.1 gram of kephalin by mouth daily for a total period of six weeks, and also administered three 0.05 gram doses subcutaneously, the injections inducing, however, local irritation. The results were apparently not unsatisfactory, the patient having no severe attacks of bleeding for a considerable period, but the authors do not believe kephalin exerts and lasting effect on the disease process. In healthy rabbits intramuscular or intravenous injections of kephalin had been found to cause a transitory increase in coagulability.

A solution asserted to contain the thrombokinetic substance in nearly its pure form, in addition to the proferment prothrombin, has recently been prepared by Lapenta and Walters, 1918. It is held to be suitable for intravenous, subcutaneous, intraspinal, and, doubtless, also for local use. Clinical experiences have, however, not yet been reported.

Witte's peptone, though exerting no effect on coagulation when added to drawn blood, has been found when injected intravenously in animals in relatively large amounts to cause a marked but temporary diminution in the coagulability of the blood—an effect which Howell ascribes to the liberation of an excess of antithrombin in the blood stream. Nolf found, however, that when injected into a vein only slowly, or given subcutaneously, peptone increases blood coagulability, apparently by provoking an abundant liberation of thrombozyme. Upon this observation has been based the treatment of hemophilia with Witte's peptone, recommended by Nolf and Herry, in 1909, as being more effectual than

fresh blood serum, and supported with clinical reports by Nobécourt and Tixier. The solution used consists of peptone, five parts; sodium chloride, 0.5 part, and distilled water, 100 mls. This is heated to boiling, filtered while hot, then sterilized at 120° C. The subcutaneous dosage is three to ten mls, repeated at intervals of three or four days in courses of three or four injections, renewed about every month. Nobécourt and Tixier have reported cases in which immediate improvement followed peptone injections after serum injections had failed. In a case of familial hemophilia recorded by them in 1913, sixty-seven injections were given in two and a half years. The clotting time in this patient was reduced from three hours to twenty-five minutes, and the tendency to hemorrhage kept under fair control. On the whole, peptone injections would seem worthy of trial where serum treatment proves inefficient. It should be remembered that imperfectly prepared solutions, or the administration of peptone in excessive amount, is likely to cause fever, headache, local pain, and at times an erythema.

(To be concluded.)

Transfusion.—A. R. Kimpton (*Boston Medical and Surgical Journal*, March 14, 1918) says that the greatest field of usefulness for transfusion is for acute secondary anemia, that is, severe hemorrhage. For so called shock, uncomplicated by hemorrhage, it may be of great value, but too much has been claimed. For hemorrhage of newborn babies transfusion is specific, and the use of the longitudinal sinus is one of the most valuable advances in surgical technic. The tube is filled through the needle and emptied into the longitudinal sinus through the needle. For hemophilia, transfusion is specific for the attack. Transfusion is frequently of great value in chronic secondary anemia, but is of no value in acute sepsis, or acute primary anemia, such as acute leukemia. In chronic primary anemias, such as pernicious anemia, it has only temporary value and for a variable length of time. It is the most efficient treatment for pernicious anemia, and alone offers as much splenectomy with or without transfusion, while carrying none of the dangers. It usually brings about a remission by crisis, while other remissions usually come about slowly.

Kimpton says that reaction rarely follows transfusion of whole undiluted blood in his hands, though reactions are very common after transfusion of citrated blood. Massive transfusions of citrated blood may be dangerous. A Wassermann, especially of the donor's blood, should be made when time allows. Isoagglutination tests should always be done, best in laboratory, between fresh bloods, as without these transfusion may cause death. Even with these tests by trained men he has twice seen agglutination, so there are undoubtedly serum reactions we do not yet know tests for. He gives the following as a rough but fairly accurate bedside test which may be carried out:

Donor's blood: 1. Two to three drops plus oxalate, one half per cent., or salt solution equals corpuscles; 2. Two to three drops plus distilled water equals serum.

Recipient's blood: 3. Two to three drops plus oxalate, one half per cent., or salt solution equals corpuscles; 4. Two to three drops plus distilled water equals serum.

The oxalate or salt solution keeps the corpuscles free. The distilled water takes the corpuscles and gives serum. On a hanging drop slide one drop of number one is added to one drop of number four; this gives donor's corpuscles to recipient's serum. The same with two and three gives donor's serum to recipient's corpuscles. These are observed twenty to thirty minutes with microscope or hand lens for clumping. If marked, this may be seen with the naked eye. Blood tests he does not believe to be necessary for newborn babies, as bloods are not usually grouped until the child is about two years old. Reactions are more likely to follow repeated transfusions, especially after four or five have been done, whether the donor is the same or not. In cases of urgent need where blood tests could not be made he says that he should never hesitate to transfuse, because many more patients would be saved by doing the transfusions without the tests than would be saved by not doing them.

Overcoming Mechanical Obstructions to Pregnancy.—Robert T. Morris (American Journal of Obstetrics, February, 1918) states that where the Fallopian tubes show arrested development with fibrous nodules and apparent closure of the oviducts for some distance, he passes a probe to one corner of the uterus, then, through an abdominal incision, exposes the oviduct lumen at a point as close as possible to the uterine lumen. He then makes a slit in the ampulla of the fimbriated end of the oviduct, and finally sutures the distal end of the oviduct, and vicinity of the opening near the corner in such a way as to make a short circuit past the seat of obstruction. Pregnancy has followed this procedure. In the presence of oviducts surrounded by adhesions, clubbed distally, closed, and without fimbriae inside, Morris splits open the clubbed end of the tube and dusts it freely with aristol. While mechanically preventing closure of the incision, the aristol is so benign, if free from grit, that the peritoneum makes no serious effort at walling it in with plastic exudate. It will remain in place many months, doubtless presenting an obstacle to the passage of ova during that time, but eventually being taken in solution by the fat of normal tissue cells. If the clubbed tube is not completely patent to the uterine cavity the procedure already described for fibrous oviducts may be carried out in addition. In certain cases of myoma or fibromyoma in which pregnancy is much desired, a uterus can sometimes be constructed from scraps of uterine tissue that have remained intact. In such a case the patient must be informed that a recurrence of the growth and another operation are to be anticipated. In a case in which both oviducts and an ovary had been removed and the conserved ovary had apparently undergone complete degeneration, the patient being, however, willing to take desperate chances to secure pregnancy, the author sutured to the uterus one third of an ovary from another patient. A month later the abdomen was reopened and, the graft being found in good condition, a three

inch loop of ileum with mesentery attached was separated from the rest of the ileum, flushed out with formalin solution, and then sutured in such a way that the ovarian graft was included in the lumen of one end of the ileal graft while the other end of the ileal graft was led into an incision in the fundus of the uterus and so sutured that the mucous secretion would continue to flow by way of the lumen of the uterus. An artificial oviduct was thus constructed. In another case the appendix vermiformis was used for the same purpose.

Alkaline Treatment of Eclampsia.—Jose A. Maldonado (*La Cronica Medica*, of Lima, February, 1918) has found that the normal alkalinity of the blood of sixty per 1,000 is reduced in eclampsia to forty or even thirty. If the patient is first seen in the interval between attacks he gives .01 gram of morphine sulphate by hypodermic and also four grams of chloral hydrate by rectum in fifty c. c. warm water. This treatment usually prevents recurrence of attacks. If the patient is seen during an attack, the morphine is given and the quiet stage awaited before giving the chloral enema. Maldonado considers that chloroform is contraindicated, as he has shown that any anesthesia reduces the normal alkalinity of the blood and tissues. One quarter of an hour after the chloral enema he gives another enema with fifty grams sodium bicarbonate in 400 c. c. warm water, which is best given by the Murphy drip method. Later he gives potassium bromide or chloral by mouth every two hours followed the next day by a saline purge. On subsequent days a diuretic treatment is continued with potassium nitrate or acetate in uva ursi and oxymel of squills, a milk or salt free diet is given, with small doses of bromide and chloral three times daily to maintain a state of low nervous excitability.

General Analgesia by Oral Administration.—L. A. M. A. (Journal A. M. A., April 6, 1918) present a preliminary report upon a series of animal experiments to determine the feasibility of producing general analgesia by the oral administration of various narcotic drugs. As a result of these experiments the following formula was found to give the most favorable results:

Liquid petrolatum,	16.0 (dr. iv.)
Peppermint water,	0.3 (min. v.)

This dose could be taken with ease, and very little bad taste if sandwiched between mouthfuls of port wine. It produced a marked degree of general analgesia, sufficient to permit otherwise painful dressings being accomplished without discomfort. Combined with a few whiffs of chloroform, short operations could also be performed without pain. The formula was improved, and as now used is: Chloroform, from two to four mils (half to one drachm), and fourteen mils (dr. iiss) each of ether and liquid petrolatum. The solution produces no ill after effects, and is quite without danger, as it does not produce anesthesia. The vaporization of the ether has been shown to be slow and uniform from oily solution, hence the action of the mixture is even and continued.

Acute Diverticulitis of the Colon.—John F. Erdmann (*Surgery, Gynecology, and Obstetrics*, February, 1918) writes thus on the operative treatment of acute diverticulitis of the colon: In the acute types, one either drains or excises and sutures as in appendicitis. In a great many of the acute and gangrenous cases, one can excise the protrusion, refresh the edges if necessary, and suture, while in other patients the edematous condition found is obstructive to suture work and one must rely upon draining or upon imperfect closure of the opening by sewing the surrounding omentum to the intestinal opening. Where the opening exists in the mesosigmoid or mesocolon, splitting one or both layers of the peritoneum forming these mesostructures and draining is advisable. In the chronic infiltrated obstructive type excision of the gut is demanded with anastomosis, preferably end to end. In the irritative variety, noninflammatory or acute, careful attention to the intestinal tract and warning the patient of the acute emergency possibility is in order. Attention has been called to the possibility of succeeding attacks occurring. These are not of necessity in one diverticulum, but as in the case referred to in several different diverticula. Such an occurrence as before stated will of necessity provoke a very guarded prognosis as to cure, and should also cause us to give a very guarded prognosis even after successful resection of certain segments, as the presence of diverticula throughout the colon is more than possible although not visible during the operative procedure.

Tunneling of the Prostate in Prostatic Hypertrophy.—G. Luys (*Bulletin de l'Académie de médecine*, February 12, 1918) recommends the substitution for prostatectomy in a large number of cases of prostatic hypertrophy a tunneling operation whereby, directly in the prostate itself, the obstacles to the free outflow of urine are destroyed *de visu*. These obstacles are two in number, viz., the so called prostatic bar, and the contact established between the two hypertrophied lobes of the prostate, forming an irregular channel as long as six to eight centimetres anteroposteriorly. The destruction of these obstacles is accomplished with the author's direct vision air cystoscope and the galvanocautery. The patient is always placed in the inverted position, to facilitate distinction between the prostatic and bladder tissues in the region of the neck of the bladder. The prostatic bar is cut vertically by the cautery under the control of direct vision and the cut then opened out laterally in the shape of a broad V, the inferior apex of which should extend down to the floor of the bladder. The second step consists in destroying the lateral lobes with the cautery as one would dig a hole in a potato, the cystoscope being gradually drawn forward during the process. An actual tunnel is thus produced which, for best results, should extend completely from the neck of the bladder to the posterior margin of the verumontanum. When the tunnel has been well rounded out, so that the cystoscope slips easily through the whole prostatic urethra, the certainty is acquired not only that the patient will urinate easily, but also that there will be no residual urine. The operation is best done in three to six sittings at weekly intervals. The cau-

tery frequently induces oozing of blood, but this is quickly stopped by electrocoagulation. The method is especially applicable in small prostatic hypertrophies, with but little retention, and in cases in which suprapubic prostatectomy is contraindicated by reason of infection of the posterior urethra and bladder. It is entirely safe, does not necessitate general anesthesia nor a stay in the hospital, and can be applied in cases with renal impairment which could not withstand a severe surgical operation. The functional results are both immediate and lasting.

Toxicity of Emetine Hydrochloride.—J. Guglielmotti (*Presse médicale*, January 24, 1918) states that the toxicity of emetine hydrochloride may be manifested in three different grades: Massive or immediate toxicity, with death within twenty-four hours. In the dog 0.005 to 0.0075 gram of the salt per kilogram of animal is regularly fatal. Deferred or mediate toxicity, death occurring in from seven to twelve days after administration. Cumulative toxicity. Continued daily administration to a dog of one tenth the dose—0.00056 gram per kilogram—which is lethal in twenty-four hours—0.005 per kilogram—may ultimately cause death. In the adult human subject the effects of massive toxicity are not met with, but fatal intoxication is to be apprehended from a dose of 0.6 gram or upward. Death is probably certain after a single dose of 1.2 gram. The intravenous route of administration should not be employed. Evidences of cumulative toxicity have been demonstrated in many reported cases. To be on the safe side, 0.15 gram should be injected daily on not more than five or six consecutive days; nor 0.1 gram for more than eight or ten days, nor 0.05 gram for more than fifteen or twenty days. Long intervals between series of injections should be allowed.

Regeneration of Bone.—Albert A. Berg and William Thalheimer (*Annals of Surgery*, March, 1918) conclude as to regeneration of bone that: Periosteum, devoid of adherent bone cells when transplanted into foreign tissues, produces bone. Endosteum and osteoblasts lining Haversian canals in bone transplants produce bone very actively. The cambium layer when adherent to transplanted cortex produces bone. Some bone cells in the transplant are able to persist for almost a year, but most of the bone is absorbed. Fully developed adult bone cells, although they may remain alive for a considerable time, do not reproduce themselves and form bone. Very young lacunar cells can reproduce themselves and form bone. Transplanted bone is absorbed not only by osteoblasts, but also by direct action, biochemical, of growing young bone, and the transplanted bone is replaced either by a creeping forward of the new bone or a gradual extension or expansion of the new bone into the transplant. Marrow spaces and hematopoietic marrow are formed in the bone which develops from transplanted periosteum. The source of these hematopoietic cells was not determined. Bone when it grows into cartilage does so in the same manner characteristic of the normal embryonic development of enchondral bone, including also epiphyseal formation.

Serum Dosage in Diphtheria.—J. Comby (*Presse médicale*, January 24, 1918) warns against hesitation and delay in the treatment of diphtheria by antitoxin. Often, in insidious forms of the disease, the child has already been ill three to five days before the physician's initial visit, and even then the physician will frequently withhold specific treatment another day while awaiting a positive bacteriologic diagnosis. In severe cases the amount of antitoxin administered is often unwarrantably small, through apprehension of anaphylactic manifestations. The ratio of cases with such manifestations in Comby's experience has been but fifteen per cent., but even if this ratio were exceeded, the resulting erythema, urticaria, arthralgia, or fever are trifling and ephemeral, and death from this reaction never occurs. A mere suspicion of diphtheria indicates immediate serum injection, without waiting for the results of the bacteriologic examination. Even in subjects who have previously received serum, a large dose—never less than twenty mls of the French official antitoxin, should be given at the start. In severe or tardily treated cases, the dose should be from forty to 100 mls, to be repeated within twenty-four hours if necessary. A child of three years, seen on the fourth day, received 120 mls in thirty-six hours, and a girl of fifteen, 600 mls in the course of a few days. Under such doses the throat and nasal fossae rapidly clear and apparently hopeless cases recover. Serum reactions seem less frequent and marked after large than after small doses. Large doses, moreover, are therapeutically allsufficient, rendering throat irrigations and applications, with the attending discomforts in small patients, quite superfluous.

A Simple Operation for the Retroversion of the Uterus.—A. U. Besesen (*American Journal of Surgery*, January, 1918) first sets down Dudley's technic. In Besesen's modification of the operation he does not carry the suture to the horn of the uterus, but prefers to start with the needle at a point about one half to one inch distal to the uterus, passing the needle through the round ligament and then from point to point to its exit at the internal ring, there the needle is made to take a bite through the tissues at the ring, and is returned in like manner to the point of starting. The opposite side is treated in the same way. When the operator draws taut the suture of the one side and an assistant draws taut the suture of the opposite side it is easily determined how much tension will be required to bring the uterus into the corrected, or, better, slightly overcorrected, position. The sutures are then tied. If desired a shortening of the uterosacral ligaments can also be performed to give added security. By this method, he says, we avoid the long strand of ligature that must necessarily be exposed when the suture is tied in the Dudley operation. If the two extremes are drawn into opposition we produce not so much a crumpling of the ligament as a bending or doubling of the ligament on itself, in a manner to form an irregular circle, thus practically eliminating the round ligament as a factor in the support of the uterus. He thinks that the operation is especially advantageous in patients who have not passed the menopause, and who are in fairly good physical condition, with tissues sufficiently firm to hold by suture.

Prognosis in Surgery of the Aged.—Frank C. Yeomans (*American Journal of Surgery*, February, 1918) states that the following are five cardinal rules for successful surgery of old people: A correct diagnosis made by thorough, and if necessary, repeated examinations before the operation. A definite plan of operation, executed with the greatest celerity compatible with safety. Rigid asepsis for the powers of resistance to infection in the aged are limited. Control of hemorrhage by the Esmarch bandage, posture, segregation, and by division of vessels between clamps, for blood lost is not quickly replenished in old people. Careful handling of tissues. Trauma of tissue results in diminished resistance and favors infection. "Quickly in and quickly out" is imperative when invading the abdominal cavity and with the least possible evisceration.

Inexpensive Treatment of Psoriasis.—H. Gougerot (*Paris médical*, February 9, 1918) lays stress on the frequency of a bacterial epidermitis which strikingly resembles psoriasis in all its different aspects. Impetigo and other similarly caused conditions may pass into this form of pseudopsoriasis. Mistaking the latter for psoriasis is not a serious matter, for the treatment of psoriasis by reducing agents will also overcome it. Recovery is more prompt, however, if the treatment for pyogenic conditions is applied, viz., the use of silver nitrate and yellow oxide ointment. Gougerot describes in detail the measures he has found most serviceable in hospital cases, among soldiers and the poorer classes. He praises Bory's new treatment of psoriasis by intramuscular injections of sulphur in oil. He adds to it, however, the administration of sulphur by mouth and other routes. Thus, pills of 0.5 gram of sulphur and 0.15 gram of extract of krameria are given by mouth to the number of two to sixteen a day, according to intestinal tolerance. Inunction with petrolatum containing ten per cent. of sulphur is also employed. Sulphur, while probably the most efficacious internal treatment known, is not constant in its action and must usually be supplemented by external measures, e. g.,

Sulphuris loti.....2 to 8 grams;

This is to be applied over the whole body morning and evening, except over the scalp and the small area where a strong ointment is to be used. Ten per cent. sulphur in petrolatum is cleaner and cheaper than the above, though less effectual. Over a single small area a strong reducing ointment is used, e. g.,

Unless irritation results, the strong ointment is applied daily for six to twelve days, then used over another small area, the sulphur paste being meanwhile employed continuously over the whole body.

Miscellany from Home and Foreign Journals

Formation and Composition of Spinal Fluid.—J. F. McClelland (*Journal A. M. A.*, April 6, 1918) points out that the spinal fluid is not an ordinary filtrate, as shown by its relative freedom from proteins in health, and at the same time suggests that the theory that it is a secretion is not borne out by the results of his experiments. The experiments seem to indicate that the fluid is an ultrafiltrate of the plasma to which are added the secretions of some cells. The high protein content of the fluid in some diseases may be explained on the ground of a leakage in the filter. The alkaline reserve of the spinal fluid is almost precisely the same as that of an ultrafiltrate of the plasma of the animal from which the fluid is obtained.

Chronic Tonsil Infections.—Josiah J. Moore (*Journal of Laboratory and Clinical Medicine*, February, 1918) follows the classification of Simon and Williams, based upon the location of the lesion. He discusses chronic lacunar tonsillitis, chronic interstitial tonsillitis, and chronic peritonsillitis, as well as syphilis and tuberculosis of the tonsils. He points out the part played by the tonsils in disease "carriers" where virulent bacilli persist in the tonsillar crypts. The tonsils may also become chronically infected with meningococci and the virus of poliomyelitis may be harbored there. The examples cited suggest that the infecting organism of many diseases which enter the body through the upper respiratory system may lodge for a long time in the crypts of the tonsils, thus producing a chronic "carrier."

Diataxia Cerebralis Infantilis.—J. Ramsay Hunt (*American Journal of the Medical Sciences*, April, 1918) directs attention to the existence of a pure ataxic type of the cerebral palsies of childhood to which he has given the name of diataxia cerebri infantilis. He gives in detail the histories of three cases, with a discussion. It appears to be a special form of the cerebral birth palsy in which the symptomatology is characterized by a generalized disturbance of coordination without evidences of paralysis, spasticity, epilepsy, or serious mental defect. The sensibility, both special and general, is apparently unaffected. The clinical picture is believed to be dependent upon a bilateral vascular lesion in the parietal region resulting from an injury at birth. The disturbance of coordination affects speech, gait, station, and the use of the extremities, and is purely ataxic. It may be distinguished from cerebellar ataxia by the character of the motor disorder, its persistence in the recumbent posture, and the absence of nystagmus. It may be regarded as the sensory equivalent of the spastic type of Little, and is not infrequently encountered in combination with this affection, constituting a diataxic diplegia. As in Little's disease, there is a tendency toward improvement, although the development of motility is always seriously retarded. In its more severe forms this disorder of coordination may be associated with a tendency to atactiform movements which resemble superficially the phenomena of genuine chorea and athetosis.

The Factors of Coagulation in the Blood in Certain Pathological Conditions.—Dorothy Foster Pettibone (*Journal of Laboratory and Clinical Medicine*, February, 1918) worked on the prothrombin calcium salts and platelets in forty-five cases. She found that the coagulation time of hemophiliacs is long. One of the cases reported was particularly interesting. There was a definite history of familial hemophilia. The patient's coagulation time was very long; his prothrombin time was within normal limits, and his platelet count was 115,000 per c. m. His mother's blood showed an exceedingly long prothrombin time and a normal coagulation time. There was a constant deficiency in prothrombin but apparently no deficiency in calcium in the hemophilia cases. The blood of epileptics seems to show no change in the coagulation time. In hemorrhagic purpuras the platelet count was low, and there was no retraction of the clot. Cases of jaundice of several weeks' duration showed a marked calcium deficiency and a normal platelet count. In myelogenous leukemia the prothrombin time is prolonged and the coagulation time quite short. One patient with pernicious anemia showed the prothrombin slightly diminished, and the platelet counts relatively normal. In splenomegaly the prothrombin time was delayed, and the coagulation time rather long.

Diagnosis of Cancer of the Breast.—J. Shelton Horsley (*Virginia Medical Monthly*, January, 1918) emphasizes the fact that cancer is not painful in its early stages. A benign breast tumor is more likely to cause pain than is early cancer. After ulceration has set in, with secondary infection or pressure on nerves, pain begins, but operation is then often too late. If ulceration, retraction of the nipple, and glandular involvement could be eliminated from text books as symptoms of mammary cancer, the lives of hundreds of women would be saved every year. There is no one positive early sign, but one may build up the evidence and make a probable diagnosis. The typical early cancer occurs in a woman past thirty-five years of age and begins as a single lump. Usually limitation of motion can be detected upon careful observation. The skin may not move freely over the growth or the lump itself may not move freely in the glandular tissue, though there is always some motion. Picking up the skin over the tumor sometimes shows points of attachment to the skin. The affected breast often does not hang as low as the unaffected breast. These symptoms, if present, amply justify immediate operation. If there is doubt, the patient should be prepared for a radical operation and an incision made in the growth. As a rule, inspection and palpation will then determine the diagnosis. Cancer usually feels hard, and has no capsule to retract upon incision as does a benign tumor. If there is still some doubt, a frozen section should be made and reported upon at once. The incision should be thoroughly cauterized immediately after removal of the sections, and if the latter are positive, the radical operation proceeded with at once.

Bacteriological Findings in Ozena.—Herbert C. Ward and Donald C. Beaver (*The Journal of Laboratory and Clinical Medicine*, March, 1918) studied seventy cases in which 150 bacteriological examinations were made. In fifty cases diagnosed as ozena *B. mucosus capsulatus* appeared in forty-two instances, and the diphtheroid bacilli were the next most often found. The Perez group appears in two strains in forty-five of the fifty cases. In the cases containing no Perez types an organism listed as *B. proteus vulgaris* was present, so that these two groups are responsible for the malodor in ozena. Another group of cases was studied which was diagnosed as atrophic rhinitis and differed from the first only in the absence of odor. Here the capsulatus group was the most abundant and the Perez and proteus groups the least abundant. The suggestion is made that the presence of a Perez proteus infection can be detected by clinical examination alone, and that bacteriological investigation is not necessary.

Diphtheroids in Female Sterility.—T. C. Stellwagen, Jr., and P. S. Pelouze (*Journal A. M. A.*, April 6, 1918) report a case in which a man suffered from an acute urethritis due to the Hoffmann type of pseudodiphtheria bacillus which he contracted from his wife. The wife's cervix gave a pure culture diphtheroids. Both husband and wife were treated locally and by autogenous vaccines and were cured. The couple had been sterile for six years and the woman had been under gynecologic treatment for a year and a half without relief of the sterility. The husband's spermatozoa were abundant and active. Following the cure of the diphtheroid infection pregnancy resulted in about one month and a healthy child was born later at term. Two other cases of female sterility were subsequently examined and in one there was a pure culture of diphtheroids while the other showed a mixed infection with these and other organisms. The relation between these organisms and female sterility is not proved by this observation but the conditions are suggestive.

Edema of Upper Extremity in Chest Wounds.—V. Combiere and J. Murard (*Bulletins et mémoires de la Société médicale des hôpitaux de Paris*, December 13, 1917), among about 100 cases of wounds of the thorax, met with edema of the upper extremity in six instances. Such cases are typically those in which paracentesis or thoracotomy has been performed. In the absence of any sign of pleural retention the edema appears suddenly and painlessly in the arm of the corresponding side. In two cases the edema involved the entire limb, was most marked in the fingers, and pitted on pressure. In one case it persisted a month. In the remaining four cases it was a localized edema, affecting only the distal part of the arm and the proximal part of the forearm, especially on the inner aspect. The edema was very soft and the overlying skin appeared somewhat dried out. The condition in no case lasted more than three weeks. The diffuse type of edema is ascribed to venous obstruction by thrombosis, the latter having presumably extended to the axillary vein through the anastomoses between the thoracic veins and those of the extremity. Secondary

thrombosis through pressure by engorged lymph nodes may also be responsible; lymphatic anastomoses are known to exist between the bronchopulmonary and the axillary nodes. The localized form of edema is more difficult to explain, but is probably due to a disturbance of the lymphatic circulation in the affected tissues, just as in chronic peritonitis there occurs sometimes a local edema in the lumbosacral region. Suppuration of the pleura reacts on the lymphatic circulation in the entire hemithorax. The edema is favored by recumbency, and the authors now treat all cases of chest wound in the sitting position. Edema, when it occurs, is treated by elevation on a pillow or suspension of the limb.

The Control of a Smallpox Epidemic by Vaccination.—A. Gould (*British Medical and Surgical Journal*, March 21, 1918) reports an epidemic that broke out in a factory having 15,000 employees. About 5,000 were found to be not vaccinated. These were vaccinated in November. The number of cases of smallpox that had appeared were: in September, 2; in October, 10; in November, 32. After the vaccination 3 cases of varioloid developed in December, and no smallpox since. Gould's experience leads him to conclude that: Smallpox occurs, almost without exception, only in those not protected by vaccination; vaccination protects longer than the assigned seven years.

Blood Transfusion.—P. Ameuille (*Bulletin de l'Académie de médecine*, February 12, 1918) notes that the ideal method in blood transfusion is to collect the blood of the donor through a needle and inject it similarly in the recipient, thus avoiding any incisions or serious vascular injury. With Queyrat's needle, 300 to 500 mls of blood can be withdrawn from the veins at the bend of the elbow in a normal subject. The puncture with Queyrat's needle causes but little pain and cannot give trouble in any way. The blood as it runs out is collected in a sterile receptacle containing about 0.1 gram of sodium citrate for each 100 mls of blood to be withdrawn. Enough water will be present in the receptacle if the citrate is merely dropped in it in the dry state and the receptacle then sterilized in the autoclave. The receptacle should be continuously shaken while the blood is dropping into it. The blood is then reinjected in the recipient from a wash bottle connected with a rubber bulb as though an intravenous saline injection were being given. By this method the blood can be kept—at 37° C.—as long as four days without harm to the recipient. At the front the author has found it feasible to provide for emergencies by keeping several bottles of citrated blood in the incubator. With so easy and harmless a method donors are easily found, and a single donor can without inconvenience supply additional blood two or three weeks after the first withdrawal. As the blood can be kept for a time, it can be carefully watched to make sure that it does not undergo spontaneous hemolysis. Time is also given for carrying out a Wassermann test with it in the case of a suspected donor. The entire procedure of transfusion is so facilitated that it becomes available not only for posthemorrhagic anemias but also for certain medical anemias and even for infections or dyscrasic states.

Chancriform Gonococcic Ulcerations.—R. Bunnier (Paris médical, February 2, 1918) states that textbooks do not as yet refer to these ulcerations, first described by Julien in 1896. He reports two cases, neither of which had at any time had a urethral discharge, yet in one instance exhibited a gonococcic ulcer of the penis simulating a soft chancre and in the other, an ulcer simulating a hard chancre. Such ulcers may be encountered in either sex. In the male, they are usually situated on the glands, occasionally on the prepuce or at the anal margin. In some cases the ulcer is oval or circular, with a deep red base, smooth, and superficial, or deeper, with vertical margins and an indurated base. Enlargement of the inguinal glands on one or both sides, with or without suppuration, and a more or less pronounced phimosis, complete the analogy. In another group of cases the ulcer is serpiginous, with a grayish or yellowish base, loosened margins, occasionally a dorsal lymphangitis, and positive auto-inoculation. In the female, gonococcal ulcerations are, as a rule, multiple, rounded or in the form of a fissure, and situated at the meatus, cervix, fourchette, orifice of Bartholin's duct, or anal margin. Edema of the labia often coexists. Lymphangitis and adenitis generally accompany these gonococcal ulcerations. The diagnosis can be made only by examination of smears for the gonococcus. In most cases there is a history of urethritis. Occasionally the Ducrey bacillus or the spirochete of syphilis or both can be detected simultaneously in the ulcer discharge. The gonococcal ulcerations, in conformity with gonococcal involvements in other structures, are peculiarly rebellious to treatment. The latter consists of applications of potassium permanganate, silver solutions, or zinc chloride. In some instances curettage and the thermocautery must be resorted to.

Cardiovascular Examination.—S. Calvin Smith (*Journal A. M. A.*, March 30, 1918) draws from analysis of the results of the examination of some 35,000 men in one of our military camps. Visible pulsations and accelerated pulse rates not due to emotional causes, and displacement of the maximal cardiac impulse downward and to the left and changes in rhythm and volume of the pulse were regarded as of greater significance than the detection of cardiac murmurs. Many murmurs were noted which disappeared on lying down after brief exercise, and these were evidently functional, due to a decreased tone of a strong heart with rest. Murmurs which persisted at given areas, which were accompanied with accentuations, thrills, or cardiac enlargement, or which were typically transmitted were regarded as important. The exercise test of 100 hops on one foot proved most valuable by often bringing out evidences of slight cardiac hypertrophy and myocardial affections which could not have been discovered otherwise. It showed the presence of auricular fibrillation and brought out a pulse deficit in three apparently healthy young men. Blood pressure determinations were of value in the detection of early aortic insufficiency by showing a femoral increase, as compared with the brachial pressure. Such cases had no other signs except a slight basal murmur and precordial pain with exaggerated breathing after exertion. Of the entire number of

men only slightly over one per cent. were rejected. Of the rejections over 66.5 per cent. were due to mitral lesions and less than one per cent. to aortic. In some fifty-two per cent. of the cardiac rejections measles was prominent in the previous history, and it seemed that that disease might not be so harmless as commonly considered. Nearly twenty-seven per cent. of the men examined showed some thyroid enlargement, but this did not seem to have any bearing on the presence or absence of cardiac disorder and seemed to be due to the severe demands of military training in men previously "soft." The average normal pulse rate for these healthy young men was found to be about 82 rather than the classical 72 per minute.

The Estimation of Urobilin and Urobilinogen in the Duodenal Contents.—Herbert Z. Giffin, Arthur H. Sanford, and Thaddeus L. Szlapka (*American Journal of the Medical Sciences*, April, 1918) thus summarize their observations: With a few slight modifications of technic we have used the method of Schneider in estimating quantitatively the amounts of urobilinogen and urobilin in the duodenal contents obtained by means of an Einhorn tube. The procedures are simple and can be carried out in any clinical laboratory. The results are comparable with those obtained by the more complicated and time consuming methods in which stool extracts are used for the estimation of these pigments. In a group of twenty-two miscellaneous cases, low values were obtained in patients with anemia from hemorrhage, carcinoma, tuberculous peritonitis, syphilis, portal cirrhosis, chronic infectious arthritis, and gallstones. They were low in three or four patients with myelocytic leucemia. The amounts of these pigments were especially low in cases of anemia from hemorrhage. In hemolytic jaundice the values were consistently high even when severe anemia was not present. The values fell appreciably after splenectomy, but not as promptly as in pernicious anemia. In pernicious anemia the amounts of urobilin and urobilinogen in the duodenal contents were above normal in eighty-four per cent. of the cases. The amount of urobilinogen was constantly increased when the anemia was severe. Patients over the age of fifty-five showed lower values than younger patients. The values presented no definite relationship to the size of the spleen. Following splenectomy there was a very definite decrease in the amounts of urobilin and urobilinogen; the decrease in urobilinogen was especially noticeable. The amounts of bilirubin in the duodenal contents did not run parallel constantly to the amounts of urobilin and urobilinogen.

Preservation of Typhoid Bacilli in Stools.—T. H. C. Benians (*Lancet*, February 16, 1918) experimentally confirms the work of Teague and Clurman, showing that the emulsification of suspected stools in thirty per cent. glycerine in 0.6 per cent. salt solution greatly enhances the chances of securing a positive result from bacteriological examination when the stools have to suffer delay before they are examined. The preservative action of this glycerine solution is specially valuable in warm weather. Apparently all forms of the typhoid-paratyphoid organisms are equally well preserved while the lactose fermenters decrease in numbers.

Proceedings of National and Local Societies

NEW YORK ACADEMY OF MEDICINE.

Stated Meeting with the Cooperation of the Section on Laryngology, December 20, 1917.

The President, Dr. WALTER B. JAMES, in the Chair.

The Treatment of Stenosis of the Larynx and Trachea Following Diphtheria.—Dr. HENRY L. LEXNITZ delivered this address, which he illustrated with lantern slides. In regard to the pathology of stenosis of the larynx following diphtheria, he classified it under four types, according to its causation: neurotic, spasmodic, traumatic, pathologic.

The first type, the neurotic, occurred mostly in children, though at times adults suffered from it. In cases of acute or chronic laryngotracheal stenosis where it was necessary to remove an intubation tube or change a tracheal cannula, these patients were thrown into paroxysms of fear almost amounting to convulsions. The crying or struggling of the child induced a passive congestion which invariably made reintubation or recannulation necessary because of glottic spasm and subglottic and tracheal edema. The patient breathed so much more easily through the properly fitted intubation tube or tracheal cannula that the difficulty in breathing when they were removed caused such fright that detubation and decannulation were rendered extremely difficult. This chronic neurotic fear of impending accident formed a vicious circle; venous passive congestion promoted subglottic edema and gradual asphyxiation, and the fear of asphyxiation kept up the ever active neurotic element. This made the final outcome very doubtful.

The spasmodic type usually resulted from wearing an intubation tube for a long period, especially when the vocal cords were in a state of fixation or functional disuse from a tube with a too thick neck. The wide neck intubation tube acted as a splint to the intralaryngeal muscles, and as the balance of power was disturbed between the opposing two sets of muscles, the adductors and abductors, adductor spasm was the natural result. This might be complicated by supraglottic and arytenoid edema. To give the cords a chance to separate and to allow for reeducation of the posticus muscle, an extremely narrow necked tube with a long anteroposterior lumen should be used which would overcome pure spasm of the adductors. Glottic spasm could also be overcome in a number of cases by the use of the flathead and cutout abductor tubes, but the cutout flat tubes should never be used when polypoid tissue was present. The spasm could also be overcome with tracheotomy with gratifying results.

The traumatic type was usually caused by the unskilled intubator who made a false passage into the laryngeal ventricle, or fractured the arytenoid or cricoid cartilage, or both. Cases had been seen in which digital intubation had been made with such force that the end of the tube was driven through the cartilage out into the tissues of the neck. In these days of direct laryngeal intubation such an accident was inexcusable. Tracheotomy would cause far less damage. Another traumatic condition was

to be found in those dense cicatrices which followed laryngeal fissure operations for the removal of bands of adhesions which appeared when the wound was allowed to granulate over an intubation tube. Rapid stab tracheotomy caused another traumatic condition; pieces of the trachea may have been sliced off, more than one tracheal incision may have been made, or the condition might simply be the result of thyrotomy and tracheotomy. Another condition resulting from trauma was injury as the result of tracheotomy in the autoextubation stage when there was extensive destruction above the cannula at the cricoid level. The development and prolongation of laryngeal stenosis were augmented by these traumatic and surgical measures.

Under the heading of the fourth type, the pathological, one might have hyperplastic and cicatricial types which might be supraglottic, subglottic, and infraglottic. The supraglottic was usually due to marked edema, occurring at the base of epiglottis and ventricular bands, and very likely to increase greatly and close the laryngeal opening after the removal of the intubation tube. Polypoid supraglottic connective tissue masses falling together and closing the laryngeal orifice immediately on the removal of the tube also came under this type.

Other pathological types were decubitus ulcers, paralysis, perichondritis, chondritis, metaplasia, and endochondrial bone formations. It was best to leave the tube in place when there was marked edema of the arytenoid cartilages for otherwise the arytenoid and aryepiglottic folds would close over the glottic opening and shut off attempts at respiration. The edema was not so rapid and the patient could breathe for a short time without the tube when the edema was confined to the subglottic level. There were sometimes polypoid masses of new connective tissue arising from the epiglottic base and ventricular bands which fell together, obstructing respiration, as soon as the tube was removed. If recognized, they could easily be removed with the guillotine or punch forceps and if cauterized did not recur. Decubitus ulcers occurred from the tube riding up and down and back and forth and, when of sufficient depth, caused perichondritis and chondritis and the tube was soon autoextubated. If to prevent autoextubation larger and larger tubes were employed, the resulting damage might lead to complete necrosis and disappearance of the cricoid cartilage. The speaker had devised a bulbous tracheal non-cough-up tube which had a tendency to keep the larynx open and to rest it at the same time; which put an absolute stop to autoextubation. This saved the attending physician a great deal of anxiety.

Paralysis of the motor nerves of the larynx seldom occurred. On the other hand, the superior laryngeal nerve was affected in a small percentage of cases, and this caused an inability to cough out secretions which made respiration difficult and tended to produce pneumonia through damming back of the secretions in the bronchi and lungs.

Long continued intubation might produce a metaplasia of the thyroid and cricoid cartilages.

which might result in new cartilage formation extending out into the lumen of the larynx. Perichondritis and chondritis might follow decubitus as explained before; this caused the autoextubation which, with its attendant dangers, created so much anxiety and such unfavorable prognosis. This occurred when the perichondritis and chondritis were at the cricoid level, but these inflammations sometimes involved the arytenoid cartilages and the cricoarytenoid joint and there might be fibrous, metaplastic or bony ankylosis of this articulation rendering the vocal processes and ventricular bands immobile. Another result of perichondritis and chondritis was endochondrial bone development and if the bony spurs grew directly into the larynx the case was difficult to cure. The best method was to cut them off, cauterize the surfaces and then introduce the intubation tube into the larynx.

DISCUSSION.

Dr. JOHN ROGERS said that he had become interested in the subject of laryngeal stenosis following diphtheria fifteen or twenty years ago, but in the beginning of his work he had very few cures. At that time he tried operation for the relief of the condition, but the excision of the cicatrices did not seem to permanently remove them and frequently some thing worse developed, such as loss of a large part of the thyroid or cricoid cartilages.

It was interesting to hear that the same thing had happened in a number of Doctor Lynah's cases and that these cartilages would regenerate; his specimens demonstrated that the cartilages did reform. After fifteen or twenty years' experience with these intubated cases of stenosis he was concerned with the outcome so that he followed some of them up. Last month he had received a letter from a young man, one of the earlier cases, which stated that the voice had made a nearly perfect recovery; in this case there had been a large slough of the cricoid. He had so far recovered his voice that he wished to study for the ministry. Another patient was a Vassar student who, since her graduation, had been teaching a subject requiring the almost constant use of her voice, and she suffered no inconvenience from her former laryngeal trouble. All of these cases had been handled as Doctor Lynah advised, namely, by long continued dilatation. Adults were much more difficult to manage than children, and those with intubation for chronic stenosis were more liable than children to develop pneumonia.

Quite early in his experience with these cases, Doctor Rogers was impressed with the danger of autoextubation, and to escape this complication he devised the so called plugged tube. This was an instrument with a right angled attachment, or plug, which after the intubation tube was in place was pushed through the usually present tracheotomy fistula and screwed or fastened at a right angle into the intubation tube. Doctor Lynah seemed to have improved on some of the earlier instruments, which were occasionally quite troublesome, though indispensable to the patient. The plugged tube for these autoextubation cases had to be worn for many months before the hypertrophic laryngitis, usually present and apparently causing the autoextubation,

had subsided. The fistula then usually closed spontaneously, or after freshening its edges. But during this period and for some time afterwards he had generally instituted the wearing of an ordinary intubation with a large enough neck to prevent undue cicatricial contraction. This little device was sometimes difficult to manage and occasionally unsatisfactory, and required expert workmanship to make, but on the whole it had been found useful.

Doctor Lynah was to be congratulated on his excellent results, and it was to be hoped that this method of treating all forms of chronic laryngeal and tracheal stenosis would speedily be recognized as immensely better than any other procedure.

Dr. EMIL MAYER found it almost impossible to add anything in discussion to Doctor Lynah's very complete presentation of the subject. As a rule, the laryngologist saw only the ultimate result of these cases, rather than as the essayist had done in the institutions almost immediately after infection. Stenosis of the larynx was a condition much more rare now than in the earlier days when Doctor O'Dwyer was alive and taught the method of performing intubation, and of recent years the cases seemed to have become still less in number as far as the laryngologist was concerned. It was, perhaps, well to bear in mind that diphtheria was not the only infectious disease that produced stenosis of the larynx; it had frequently occurred in typhoid fever. If the speaker were to epitomize what he had to say in regard to the treatment of these cases, he would do so in a warning against external surgery. The larynx was extremely tolerant of endolaryngeal methods of treatment; it was remarkable how the larynx could be stretched by ordinary dilators followed by the insertion of a large intubation tube.

The speaker was sorry to hear Doctor Rogers speak so pessimistically of his rectangular apparatus which in his own hands had been of tremendous value. One thing that the essayist said he would heartily endorse and that was, give the patient time to recover. They would get well. It might take time, but there was nothing that would relieve stenosis of the larynx other than patient, long continued treatment of these unfortunate cases.

Dr. WILLIAM P. NORTHRUP remembered with pleasure his association with O'Dwyer, who was the first to practice intubation inside the hospital or outside. While O'Dwyer was making his experiments and perfecting the method, the speaker was performing the autopsies. Later, results were better. Dillon Brown was house physician and he practiced putting the tubes in. The pathologist was the third. The other two had passed on. In the next room would be found a series of tubes the inventor perfected and they had never been modified since his death. Such changes as had been made had been abandoned. He was five years working on the idea before he would consent to have anything said about it outside. After it was ready for the open market there was only one thing ever changed and that was the Denhart gag. Brown was a clever operator. So was O'Dwyer, of course. The speaker had 125 intubations outside the hospital. In the experience of all three he did not recall a case of retained tube. He asked Doctor Lynah how it happened that he

saw none and his answer was satisfactory; the cases they saw were in private practice where they saw them early and the fault lay in the cases themselves. The membrane appeared first below the vocal cord.

The speaker's experience determined with the appearance of antitoxin. O'Dwyer's great achievement was first the insertion of the tube, finding it could be tolerated and making it anatomically fit the patient. (2) Intubation for cases of chronic stenosis such as syphilitic stenosis. (3) He was working on at the time he died cases of retained intubation tube. His problem had worked to perfection up to that point.

The speaker was edified by Doctor Lynah's exhibition. His was a noble work. Clinton Wagner operated on cases in which the tube was impossible to get rid of. The voice recovered very well. He operated up through the polypoid tissue, up through the wound.

Dr. D. BRYSON DELEVAN felt that Doctor Lynah's contribution this evening added lustre to the record established by those other New Yorkers who had done so much and such good work in this deplorable after effect of diphtheria. The principles underlying the treatment of chronic laryngeal stricture had been first discovered and applied in New York City. Horace Green, a New Yorker and one of the founders of the Academy of Medicine, had been the first to realize the tolerance of the larynx to the presence of a foreign body. O'Dwyer, another New Yorker, successfully demonstrated the tolerance of the larynx to the continued presence of a foreign body and followed this by perfecting the art of laryngeal intubation. Then he undertook the study of the cure of chronic cicatricial stricture of larynx and trachea. A method for this had already been instituted; the treatment of cicatricial webs of the larynx had been accomplished by dilatation, or by cutting of the web followed by dilatation, and the operation of thyrotomy for the deeper and more diffused strictures had been done, with more or less success. O'Dwyer approved of the treatment by dilatation, but considered that it should be more vigorous and that the stretching of the cicatricial bands should be continued at a maximum and for longer periods of time than had previously been possible, but he died before his idea was perfected. Doctor John Rogers subsequently elaborated it, and was entirely successful. It permitted forcible dilatation of the constricted areas with a minimum of discomfort to the patient and there was perfect retention of the tube. In addition, no further external operation was necessary in cases in which a tracheal cannula had been worn. The value and effectiveness of this method were very great. It sometimes required great patience and much time in its application, but a far greater degree of success could be obtained by these than by harsher methods. Doctor Lynah had continued the good work of O'Dwyer and Rogers until there were few cases, no matter how difficult, that were not amenable to treatment at his skillful hands.

Dr. HENRY L. SWAIN, of New Haven, thought the answer to Doctor Northrup's question as to why the difference occurred in that he saw so few cases of retained tube and Doctor Lynah had seen

so many, was that severe cases came in waves. At the Contagious Diseases Hospital in New Haven they had had no cases for two or three years until a month ago when four occurred all at a time. He has also had no cases for tracheotomy for a long time, and four occurred at once and at the same time, showing the severity of some of these cases.

The demonstration of this evening hinged on the development of the work of O'Dwyer by the use of the direct laryngoscope in the treatment of all cases. Doctor Lynah had also shown that the bronchoscope and direct laryngoscope could be used in cases of acute stenosis. The audience was to be congratulated on such a demonstration as it had been privileged to view this evening.

Dr. LEON T. LE WALD appreciated Doctor Lynah's reference to the aid of the radiograph in determining methods of treatment leading to the cure of some of his cases. He had been struck with the extreme patience of the essayist in caring for these patients and thought much of his success was due to his persistent and careful treatment in following up the cases so thoroughly, in most of whom the recovery of the voice was remarkable. In regard to the case of bronchiectasis of the upper lobe, this was of considerable interest to the speaker as being the only one in which this condition had been observed by him in an upper lobe. The question of thymic complication was interesting; in one case, treatment of the thymus gland by the x-ray had resulted in so much improvement as to lead to the belief that pressure from the enlarged gland had been the factor in keeping up the stenosis of the larynx.

Doctor Lynah, in closing, voiced his acknowledgment to Doctor Rogers for the perfection of his method of cannulation which had followed the idea of O'Dwyer but improved upon it. Formerly, operation had been performed in an attempt to get rid of the tube when there was any formation of scar tissue, perichondritis, chondritis, or metaplasia, but now most satisfactory results were obtained merely by the frequent dilatation of the stenosis. Doctor Lynah's personal experience had been that in the cases treated by intubation and prolonged dilatation the voice was better than in those cases treated by laryngotomy. He had had a number of cases with normal speaking voices following this procedure. It was true that as a rule dilatation and internal treatment accomplished very satisfactory results, but occasionally one met cases that were very refractory and discouraging, as Doctor Swain intimated and he was probably correct in attributing the severity of the original diphtheritic infection as a factor influencing the results of intubation. Doctor Le Wald's radiograms had shown some remarkable instances of the influence of an enlarged thymus upon laryngeal affections, but after appropriate treatment this enlargement would be found to have disappeared.

It was not only a duty, but a pleasure, to recall at their meetings the work of great confrères. O'Dwyer had now been gone some eighteen years, but he would have been the first to appreciate the improvements on the method he used had he been with them that evening.

Book Reviews.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

Fresh Water Biology. By HENRY BALDWIN WARD, Ph.D., Professor of Zoology in the University of Illinois, Special Investigator for the United States Bureau of Fisheries, etc.; and GEORGE CHANDLER WHIPPLE, Professor of Sanitary Engineering in Harvard University and the Massachusetts Institute of Technology. With the Collaboration of a Staff of Specialists. First Edition. New York: John Wiley & Sons, Inc., 1918. Pp. ix+1111. (Price, \$6.)

It seems but yesterday when the amateur microscopist dabbled in ponds and brooks, brought home with him his rich collection of slimes and whiled away many a workaday hour in fascinated enjoyment in the minute life before him. When the Massachusetts State Board of Health started a comprehensive survey of its water supplies, now some twenty or thirty years ago, the amateur microscopist's leisurely manner became converted into one of precise measurement and an eager search for knowledge which might be of service to the community. The sources of information, however, not only for the amateur microscopist, but for the more scientific laboratory worker that developed therefrom, were widely scattered and to be found only in monographs, published by authors from the four quarters of the earth. English literature was extremely amateurish, and there were no comprehensive manuals in any tongue. This lack has now been done away with, and in the volume before us we have for the first time an English manual, authoritative and practically arranged, which has garnered the knowledge which is so desirable to those who are interested in water supplies, particularly as related to the living organisms to be found therein. Fortunately the authors have illustrated their monograph copiously, and it can be recommended to any worker who, either from the standpoint of the amateur microscopist seeks for enjoyment, or from that of the more scientific worker, who would tend to enlarge his knowledge of the fauna and flora of the water supplies.

Dental and Oral Radiography. A Textbook for Students and Practitioners of Dentistry. By JAMES DAVID MCCOY, D.D.S., Professor of Orthodontia and Radiography, College of Dentistry, University of Southern California, Los Angeles, Cal. With 123 Illustrations. Second Edition. St. Louis: C. V. Mosby Company, 1918. Pp. 179.

The first 78 pages give a history of the discovery of the Röntgen rays and an illustrated description of x ray apparatus including a brief mention of the Coolidge tube. There are excellent directions for the regulation of the apparatus and for developing the plates and films; and especially for the position of the patient, film or plate, and the x ray tube during the exposure. But to follow the diagrams showing the position of the film and the direction of the x ray in radiography of the upper molars would result in a picture which might not even include the apices of the roots and certainly would not show enough of the important area above them. The value of an extraoral plate in missing or unerupted or impacted wisdom teeth and fractures and other injuries and diseases of the upper and lower jaws is justly emphasized, and most useful illustrated directions given for making these somewhat difficult pictures. Special mention should be made of a compression cylinder of lead glass, beveled at the open end so as to fit against the face at the proper angle of elevation for making radiographs of the upper molars. Also of several devices for holding the film in position in the mouth. Of these Leach's film holders are found by the reviewer to be especially useful. The interpretation of dental radiographs is accurately set forth and the conditions calling for dental radiography are concisely stated. Many of the roentgenograms illustrating the book are excellent, but some do not possess the maximum contrast and detail attained in book making of the general excellence of this one.

The Physical Chemistry of the Proteins. By T. BRAILSFORD ROBERTSON, Ph.D., D.Sc., Professor of Biochemistry and Pharmacology in the University of California. New York: Longmans, Green and Co., 1918. Pp. xv+483. (Price, \$5.)

It is not many years ago since this class of colloids was demarcated from others in the biological series, and yet at the present time colloidal chemistry may be said to constitute a specialty all its own, with magazines, text books, and monographs solely devoted to the study of matter as it exists in that special form known as colloids. The proteins, ever since the researches of Graham, have been recognized as a special group or a limited section of this class, and we have here an excellent monograph devoted entirely to this group. We have not the space to go into a minute analysis of this work, but it impresses us very favorably and, to all interested in organic chemistry, particularly in its relation to biology, the present volume will prove of inestimable value. A particularly interesting chapter is devoted to the kinetics of the proteid system, which affords a bridge to an ultimate understanding as to the method by which the human body, as a capturer, transformer, and deliverer of energy, may be evaluated. While it may be recognized that all social values must ultimately depend upon energy systems, as worked out in human biological activities, the time has not yet arrived for comprehensive correlations. This chapter offers a glimpse, however, in this direction, and as such will be welcomed by serious students who have gotten beyond the bottle days of the average medical curriculum. The book is well printed and is a creditable contribution from one of our American universities.

Births, Marriages, and Deaths.

Married.

BRYAN-RUMSEY.—In Trenton, N. J., on Thursday, March 28th, Dr. J. Conger Bryan, of New York, and Mrs. Margaret A. A. Rumsey.

Died.

DENNEY.—At Camp Lewis, American Lake, Wash., on Wednesday, March 27th, Captain Malcolm J. Denney, Medical Reserve Corps, United States Army, of Portland, Ore., aged forty-six years.

DOW.—In France, on Wednesday, March 27th, Lieutenant Julian Neal Dow, Medical Reserve Corps, United States Army, of Arcola, Ill., aged twenty-four years.

FYFE.—In Jersey City, N. J., on Friday, April 26th, Dr. George D. Fyfe, aged forty-eight years.

GASTON.—In France, on Sunday, April 7th, Lieutenant Perry S. Gaston, Medical Reserve Corps, United States Army, of Newcastle, Pa., aged twenty-eight years.

GRISWOLD.—In Niagara Falls, N. Y., on Monday, April 1st, Dr. Edward Payson Hamilton Griswold, aged sixty-three years.

HARDWICK.—In Dorchester, Mass., on Tuesday, April 9th, Dr. Frederick Veazie Hardwick, aged forty years.

HENDERSON.—In Fort Oglethorpe, Ga., on Monday, April 8th, Lieutenant Frederick Neal Henderson, Medical Reserve Corps, United States Army, of Rockville, Md., aged thirty-seven years.

KING.—In Pittsburgh, Pa., on Tuesday, April 9th, Dr. Cyrus B. King, aged seventy-eight years.

KROTOSZYNER.—In San Francisco, Cal., on Saturday, April 20th, Dr. Martin Krotoszyner, aged fifty-six years.

MAY.—In Portsmouth, N. H., on Monday, April 15th, Dr. James Rundlet May, aged seventy-seven years.

MOORE.—In Binghamton, N. Y., on Thursday, April 25th, Dr. William A. Moore, aged fifty-nine years.

NELSON.—In Richmond, Va., on Monday, April 8th, Dr. William Winfield Nelson, aged thirty-eight years.

RODMAN.—In Delavan, Wis., on Monday, April 1st, Dr. Andrew J. Rodman, aged eighty-seven years.

STEVENS.—In Poulton, Ga., on Tuesday, April 2nd, Dr. Walter P. Stevens, aged forty-six years.

STURTEVANT.—In Manchester, N. H., on Friday, April 26th, Dr. Charles B. Sturtevant, aged sixty-eight years.

WAGNER.—In Cleveland, Ohio, on Thursday, March 21st, Dr. Harrison Girard Wagner, aged fifty-two years.

WINTER.—In Brooklyn, N. Y., on Tuesday, April 23rd, Dr. Julius A. Winter.

New York Medical Journal

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Original Communications

A BACTERIOLOGICAL STUDY OF CIGARS.

By RANDLE C. ROSENBERGER, M. D.,

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Professor of Hygiene and Bacteriology, Jefferson Medical College,
Philadelphia.

This study was made with the idea of demonstrating the presence or absence of bacteria in cigars, or the presence of living bacteria in tobacco. A general impression, especially in the laity, is that tobacco is a good antiseptic, and that the mouth of a person who chews tobacco does not contain as many bacteria as one who does not.

For the purpose of these studies, cigars were purchased from twenty-eight different cigar stores and these taken from boxes exposed upon the cases or which had already been opened and closed many times, exposed to the air and dust of the store. No two cigars came from the same box and each cigar as purchased was placed in a paper container to prevent further contamination.

In a number of instances—twenty-four—a cigar was taken from the pocket of an individual, and the period of time that it was in the pocket varied from one or two up to seventeen days. In another series they were taken from several previously unopened boxes and examined immediately. A few of the specimens were obtained in thin white paper wrappers and a few were covered with tinfoil. Most of the cigars examined were popular brands, selling at five and some at ten cents.

It was our idea to obtain the cigars in a manner similar to a person buying a cigar, biting the end off and proceeding to smoke.

THE METHOD OF STUDY.

As soon as possible after purchase, cultures were made from the mouth end of the cigar. This was done by placing the cigar in a flask containing 100 c. c. of sterile plain bouillon, so that about one half inch of the mouth end came in contact with the culture medium. This was allowed to remain five minutes by the watch. The cigar was then removed, the mouth of the flask flamed, and the flask put into the incubator at 37° C. for twenty-four hours. A 100 c. c. flask was used, as in this size, the cigars fitted tightly as a stopper to the flask when exposed to the bouillon. In a number of instances, instead of placing the mouth end in bouillon, a dissection of the cigar was made with a sterile knife and sterile forceps, a small quantity of the tobacco being taken

from the centre of the cigar. This tobacco was placed immediately in sterile bouillon and this incubated in the same manner as the other bouillon. Invariably within twenty-four hours abundant bacterial growth was demonstrable, usually indicated by a film or pellicle, or by cloudiness of the medium.

Spreads were made from these cultures, strained with methylene blue and by Gram's method, to determine the morphology of organisms present. At the same time inoculations were made upon other culture media for further investigation.

In all, 118 cigars were studied, and from each an abundant growth of bacteria was obtained. In the majority of instances spore forming organisms developed. Among these were the following: *Bacillus mycoides*; *B. simplex*; *B. cohaerens*; *B. subtilis*; *B. megatherium*; *B. albolactis*; *B. mesentericus vulgaris*; *B. mesentericus fuscus*. Streptococci were found in four instances, but not obtained in pure culture.

In fourteen instances, staphylococci were isolated in pure culture, i. e., *staphylococcus albus* and *aureus*. These cultures were inoculated subcutaneously into guineapigs, but apart from some induration, only lasting a day or so, no further effects were noticed; in other words, no pus was formed. From twenty-five cigars, a small motile organism resembling *bacillus coli* in morphology was found, and in some cultural characteristics, but only two of these gave indol production and fermented various sugars. From one cigar, cocci were obtained, arranged in pairs, biscuit shaped in morphology, Gram negative in their staining reaction, resembling gonococci. This cigar was taken from the pocket of an individual.

In the cigars wrapped in paper or in tinfoil, the bacterial flora was just as abundant and even more varied than in those which were obtained in the usual unwrapped condition. In the cultures made from the inside of the cigar, the spore bearing organisms were more abundant than nonsporiferous bacteria. From these studies, it is seen that bacteria in the most resistant form (spore bearing) exist upon and in all varieties of cigars.

We have failed to positively demonstrate any virulent pathogenic or pyogenic organisms, but from the occurrence of staphylococci it is evident that the practice of moistening with the mouth or tongue the end, or twisting the end with the moistened fingers should be forbidden. Although the large

manufacturers disclaim any of these methods of working in good cigars, a great deal certainly does exist in the small manufacturing plants, and where a person is recovering from an illness or does not take proper care of his teeth or of his mouth, it is possible and probable that virulent pyogenic organisms or even pathogenic organisms may survive an indefinite time in tobacco.

With regard to skin diseases, tuberculosis or contagious diseases, the selection of individuals for the making of cigars should be just as strict as in the case of individuals employed as waiters or dairymen, in fact, as a measure for the protection of the public. The same rules regarding a dairyman or waiter performing his duties in cases of nursing or convalescing from a contagious illness at home should be applied to the cigarmaker.

There does not seem to be any great danger in the practice of biting off the end of the cigar before smoking, but from an hygienic and esthetic standpoint, we would suggest the clipping of the end with an individual cutter or the perforation of the smoking end with a proper appliance.

For assistance in this work I wish to acknowledge my indebtedness to Dr. M. Edward Smoczynski, former assistant in bacteriology.

SOME PHASES OF ENDOCRINOLOGY.*

BY WILLIAM V. P. GARRETSON, M. D.,

New York,

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Development in the clinical aspects of the diseases of the ductless glands began about the middle of the nineteenth century, and Addison in 1885 referred to the sickness, which bears his name, on the ground of pathologico-anatomical findings. After Gull, Ord, and Charcot had described myxedema clinically, Kocher and Reverdin in 1882-83 demonstrated this disease as due to absence of the functional activity of the thyroid gland, but the first recorded scientific application of endocrine therapy dates from the experiments of Brown-Sequard in the year 1889. Subsequently many other investigators compiled much experimental data, which constituted an entering wedge into this mysterious realm of physiology. Sajous stands out preeminently in this country as a pioneer, having elucidated much of our present day knowledge in his earlier investigations, which have stood the test of time, and have only within comparatively recent years created the interest to which this subject is justly entitled.

An understanding of endocrine function is of paramount importance to one who practices medicine intelligently, for conditions heretofore considered idiopathic, reactions not understood, perverted as well as normal physiology, drug effects, constitutional diathesis, defensive mechanisms—both physical and psychical, in fact, all observed in body reactions, normal and abnormal, is explained and interpreted by a knowledge of endocrine function.

Reduced to simplest expression, I quote Sajous's interpretation of the theory of the internal secretions: "The thymus supplies to all tissues the excess of phosphorus in organic combination (possibly as nucleins) required during the development of the body, to build up its cell nucleins."

The thyroparathyroid secretion sensitizes these nucleins to the action of oxygen. The adrenal secretion endows the blood with its oxygenizing properties. The pancreas supplies the ferments, which in the intestinal canal and nutritional leucocytes convert food materials into products harmonious to, and for the building up of tissue cells, i. e., for the anabolic phase of metabolism; the same pancreatic ferments carry on the katabolic phase of metabolism. All endogenous or exogenous substances which are not appropriate for tissue building, bacteria, toxins, venoms, etc., are subjected in the phagocytic leucocytes, the tissue cells, the lymphatic system, and the blood plasma—to the katabolic phase of metabolism which serves to convert them into eliminable end products. The defensive mechanism of the body thus forms part of its nutritional processes—the whole being dominated by the internal secretions."

I take for granted, familiarity with the more common clinical pictures of gross dysfunction of the several internal secretory glands. A knowledge of the essential dominating influences of the various glands and the physiological action of their hormones is quite necessary, that one may successfully analyze endocrine types clinically and arrive at conclusions upon which to base intelligent therapeutic procedures. It is of extreme importance to remember that there is an active interrelationship of all glandular function and in interpreting cases it is necessary to bear this in mind.

"Endocrinology teaches us to analyze our cases by close clinical observation and research. In such analysis a slipshod method is worse than useless. The family history, the previous history, the present history, personal idiosyncrasies, likes and dislikes, physical makeup and appearance, in fact all that concerns the individual must be elicited, weighed and balanced even to the most minute detail. In this way alone can success be attained." The life of every individual is dominated largely, if not wholly, by his ductless gland chain, certain of these glands assume a dominating influence on the morphology, physiology and pathology of the individual." Thus, we come to designate persons in terms of glandular types, recognizing thyroidal, adrenal, pituitary, and gonadal types, many of which are mixed types and are designated thyro-adrenal, pituitoadrenal, etc. These conclusions are arrived at only after a most painstaking study of each patient.

For example, studies clinically have proved that certain physiological and structural markings are constant to certain glandular types, and by the physical objective examination alone, without other information, we can make an accurate designation.

Noting whether an individual is tall or short, thin or stout, light or dark, observing the hair, its color, quality and distribution on the body, whether high or low implantation on the forehead; present or not in the axillae, its pubic distribution, etc. The eyebrows as an instance; in subthyroidal states the eye-

*Read before the Hudson County Medical Society, Jersey City, N. J., December 3, 1917, and the Benjamin Rush Medical Society, New York, January 5, 1918.

brows are very scanty and especially so in the outer third. In the adrenal types they are usually thick and meet in the midline bridging the nose. From the teeth alone much may be learned. Thyroidal teeth are well formed, white, clean and show good enamel. Thyms teeth show pitting and poor enamel due to deficiency of calcium salts. In pituitary types, the teeth are separated or spaced and are also white and glistening. Adrenal teeth show dark markings or spots, similar to chromaflin deposits. Gonadal teeth exhibit torsion, disproportion and frequently absence or semilunarity of the lateral incisors.

The skin in adrenal types always shows pigmentation, either as freckles, moles and larger patches of pigmentosis. These are designated as skin adrenals. The thyroidal skin is usually blond and clear and smooth. In hypothyroidal states it is scaly and rough. Dark haired and dark eyed thyroidal types are also observed, but these are not without other glandular characteristics. The vasomotor reactions of the skin are also important. One observes various responses by lightly marking the skin of the chest or abdomen. The pure thyroidal line is the pink or red line appearing quickly or slowly, and varying in duration; it may have an associated bilateral white line indicating adrenal complication or it may be a pure white line with no color response, being the true adrenal line of Sargent.

By the ears (satyr type, angel type, Lombroso and Morel types, etc.) size, shape, symmetry, as well as the bony frame and ligamentous structures, one is guided in making an endocrine classification.

Physiological, psychological, and morphological changes are observed in all individuals resulting from normal as well as pathological glandular influences. The thymus normally ceases to functionate at the developmental epoch, when gonadal activity begins. The delay of gonadal function with persistent and overactive thymic influence expresses itself in the production of persistent and excessive juvenility. Overactivity of the thyroid before the developmental epoch creates the prematurely old appearing individual—(the little old man, the familiar Lilliputian type).

"The results obtained in the experimental feeding of tadpoles are quite significant. The small amphibia that were fed on thyroid gland developed into tiny frogs, described as 'petit vieux,' and those that were fed on thymus grew into enormous tadpoles or 'grand enfants.' This experiment proves to some extent at least, why of two individuals of the same age, one may look like a premature old man, and the other have the appearance of unwarranted juvenility."

Physiological and structural changes at developmental and menopause epochs in both sexes are familiar examples of glandular control. The remarkable influence of the pituitary gland upon structural conditions is demonstrated when hypersecretion of the anterior lobe occurs creating before puberty giantism, acromegaly during adult life, and shrinking in old age. The extremes of thyroidal secretion create Basedowian characteristics (exophthalmic goitre) or cretinism and myxedema. Innumerable clinical types of great importance occur between

these two extremes, due to dysfunction of the gland.

I omit many of the other types incident to glandular dysfunction and pass on to the consideration of what is known as "tropism." "Certain diseases both of acute and constitutional character are welded, as it were, with the glandular tropisms and are part of their distinctive pathology, either functional or organic." This is not only true of Basedow's disease, acromegaly, Addison's disease, etc., but of the infectious diseases as well. To mention a few of the tropisms; measles and typhoid fever are thyroidal trope. This means that a thyroidal type of person is prone to both of these infections. Diphtheria, scarlet fever, pertussis, pneumonia and other respiratory diseases are adrenal trope.

Mumps and chickenpox (?) are gonadal trope. Syphilis is pituitrope. Tonsillitis is also pituitrope. The association between inflammation of the tonsil and attacks of appendicitis is more than coincidental. The appendix or "abdominal tonsil," so called, is of identical structure, histologically, as the tonsil. The frequent development of appendix hypertrophy and of acute and chronic inflammation after tonsillectomy is worthy of note.

Endocrine dysfunction reflects itself selectively in body organs; likewise specific endocrine types exhibit their predisposition to certain functional and organic disturbances as well as infectious disease. Given the history of the diseases of an unseen individual, one versed in endocrinology may often give such a striking description of that person's physical appearance and psychic traits as to create suspicions of wizardry. Interpretation of endocrine types enables one to prognosticate disease predisposition, when one possesses a knowledge of tropism—so called. Immunity processes are so explained. Why some individuals have measles and typhoid, others do not. Why only some have pneumonia and diphtheria. Some acquire syphilis, while others subjected to the same exposure escape infection. Some under exactly similar conditions develop neurasthenia or hysteria, while others do not. This is all explainable upon the interpretation of glandular domination.

Further evidence of glandular control in type production is noted as follows: Take for instance the domination of the pituitary gland on body structures as previously mentioned (giantism in youth, acromegaly in adult life and shrinking in old age). There are also small pituitary types as well. The domination of the pituitary gland produces femininity in the male; while the domination of the adrenals makes for masculinity in the female. The thyroidal individual has his marked personal characteristics, his bright intelligent eye, his good clean teeth, his temperamental attitude toward life, his freedom from infectious diseases except measles and typhoid, and his tendency toward intestinal and certain forms of cardiovascular and neurotic disturbances.

The pituitary individual, easily recognized by his structural makeup, has his own peculiarities. He is musical, has an abnormally acute sense of rhythm and is prone to diseases attended by periodicity (e. g. malaria) and to syphilis.

The adrenal individual has his strong masculinity, his tendency to hypertrichosis, to hyperchlorhydria, to hypertension, to certain forms of pulmonary dis-

ease, and to pigmentosis, his liability to diphtheria, to hernia and varicocele. These master types have their variants depending upon the influence of other glands, especially marked in the gonads."

Right sided symptoms point to pituitary dysfunction, left sided to adrenal dysfunction.

An intelligent conception of the intimate relationship between ductless glands and the nervous system is not only of interest to the neurologist but to the general practitioner. The interlocking directorship, as it were, existing over body physiology—between the endocrine system and the nervous system further complicates the analysis of perverted glandular function.

The influence of the psyche over glandular function is a well established fact; anger, fear, and similar emotional reactions produce an excessive secretion of adrenalin and the converse, *e. g.*, the effect of perverted glandular function as reflected by the psyche is equally demonstrable. To properly comprehend the mechanism of these reactions, more recent studies elucidating the function of the vegetative nervous system have served to interpret much that has heretofore been entirely misunderstood, and such knowledge is leading us out of the darkness of ignorance. A comprehensive idea of the etiology and symptomatology of all of the functional neuroses has been the outcome. That great scrap heap into which all nonorganic conditions have been relegated, *e. g.*, neurasthenia, psychasthenia, and hysteria, with all of the bizarre and fantastic manifestations incident to these conditions, are now capable of interpretation upon a tangible physiological basis. The two great groups of psychoses, dementia præcox (insanity of adolescence of the older classification) and the manic depressive insanities, are all pure types of endocrine dysfunction exhibited through a constitutionally inferior nervous system. Puerperal insanities and menopause psychoses are likewise patent examples.

That portion of the vegetative nervous system designated the sympathetic is part and parcel of the endocrine system, being directly allied to the chromaffin system of which the adrenals are the active glandular elements. To a large degree the determination of so called vegetative types, namely, vagotonic and sympathetotonic conditions, are explainable upon the interpretation of glandular domination.

The suprarenal gland and its paraganglion cells secrete adrenalin, which maintains the sympathetic cells in their normal state of activity.

The direct opponent of the sympathetic is the autonomic or extended vagus. These two component parts of the vegetative nervous system normally and physiologically are in a state of antagonistic balance. Any disturbance in this balance is expressed through the overstimulated or unopposed antagonist. The autonomic fibres are specially stimulated by cholin bodies and by pilocarpin, also physostigmine, eserine, and muscarine. Cholin is a hormone, the product of tissue metabolism, and exercises its specific action on the autonomic. Atropine paralyzes the autonomic. The sympathetic is unaffected by the cholin group, and as yet no agent is known to us which has a paralyzing effect upon

it. "The character of an individual may depend largely upon his reaction to cholin or adrenalin and upon the relative abundance with which these two hormones, cholin and adrenalin, are produced in his organism. Thus the autonomic or vagotonic type of individual is reserved (phlegmatic) and 'cold blooded,' with slow pulse, contracted pupils, deep set eyes, and cool, pale skin, which sweats easily and sometimes in patches, whilst the sympathetotonic type is lively and excitable, with rapid heart, bright eyes, dilated pupils, rosy color, and warm, dry skin." The many perverted physiological conditions and symptoms incident to the variable states of partial or complete imbalance of the vegetative nervous system are of great importance to consider, as an invaluable aid to diagnosis and in arriving at proper therapeutic conclusions.

Organotherapy dates back to remote ages. The Chinese treated obesity with preparations made from canine orchitic extracts, and heart disease and epilepsy with dried and powdered frogs and newts. Decoctions of toads, lizards, spiders, etc., have been used therapeutically from time immemorial, and results obtained quite potent, but entirely misunderstood, until recent investigation has shown that the skins of these animals and insects contain an appreciable amount of adrenalin owing to the presence of cutaneous adrenals. Today suprarenal extract is used in certain forms of heart disease and epilepsy with excellent results, and we still today have no other adequate treatment for eunuchoid obesity than the administration of orchitic extracts. In the use of organotherapy, one's armamentarium, therapeutically, is vastly augmented. Conditions heretofore considered hopeless frequently clear up under proper treatment with internal secretions as if by miracle, astounding and gratifying to both patient and doctor. I consider that the physician who practices medicine today without the wise and discriminating use of organic extracts is as greatly handicapped as a surgeon would be in attempting to perform a laparotomy without a scalpel. The frequent unsatisfactory results experienced by many are due to the fact that few have as yet learned how to interpret glandular dysfunction, and fewer still have learned dosage. Far too large are the doses generally prescribed, and often the patient thus suffers from aggravated symptoms.

When one remembers that *endocrine secretions are not drugs, but enzymes or ferments*, and that analyses reveal that physiologically only very small amounts of these substances are normally existent in the blood (as example, adrenalin one-2,500,000), one may realize that giving five, ten, or fifteen grain doses three times a day of any of these organic extracts is outrageous therapy. There are certain types where deficiency of secretion (*e. g.*, myxoedema and subthyroidal states) require doses of moderate size, but such doses in maximum should not exceed one or two grains daily, to obtain most satisfactory results. In the states of dysfunction, when one has but to *tickle* the gland, as it were, by stimulation through its own active principle, most glowing results are obtainable by very small doses.

There was a time when I scoffed and ridiculed such a method of therapy, feeling that results ob-

tained, such as I witnessed, were the reactions of suggestion upon the patient as well as myself, but now, after over two years of observation, carried on in both clinical and private practice, I am compelled to admit that doses even so low as one millionth grain, administered in the dilutions of potency, effect reactions which are so evident that I am forced to accept the dosage principles of Hahnemann as applied to organotherapy.

REFERENCES.

FAITA: *The Pituitary Gland as a Gland*, translated by Meyer Hilding T. Robinson. *Translation of Two Lectures on the Pituitary Gland on the Nervous System*, by Eugene L. Robinson. The writer owes much to that master, and to the writer of the foreword, Dr. Joseph Frankel, some of whose original observations, which have served to raise the science of endocrinology to its present status are incorporated in this paper, especially those regarding Tropic and Endocrine Type Classifications. PURVES STEWART: *The Diagnosis of Nervous Diseases*.

11 EAST FORTY-EIGHTH STREET.

THE UNCONSCIOUS.

BY ADOLPH STERN, M. D.,
New York.

What is meant by the unconscious? Why have the followers of Freud—the psychoanalysts—given this aspect of the psyche such a predominant position in the theory and therapeutics of the neuroses; and, as a sequel to the work in this line, broadened the domain of the unconscious in our psychic life in general? These are the questions I attempt to answer.

The infant, the child, say, under five years of age, has been described as a little savage; it has also been termed an amoral, rather than an immoral being. From the viewpoint of the psychoanalyst, these terms very nicely, though rather crudely, depict a stage of development of the individual momentous for his future happiness or psychic health; for, depending on the submerging of these "savage" or "amoral" qualities, their replacement or modification by cultural or moral standards, will the individual be well or maladjusted to society as he matures.

Let us examine this little "amoral" being more closely. It comes into this world with a yell, expressive, perhaps, of its dissatisfaction with the changed environment from a warm, comfortable resting place, in which all its wants had been constantly fulfilled, without any effort on its part: a change to a cold, less kind environment in which it must seek sources outside of itself for its comfort and existence. During the period of nursing, and for some time thereafter, it need but express by look, gesture, or sound any sign of discomfort or a desire for something, when the environment (parents or nurse) at once exerts itself in its behalf. Food is given, comfort is immediately at hand when called for. A state of supreme content is brought about at its beck and call. The nursing babe or the sleeping babe is the picture of content. The babe expressing a desire for something (by crying) is a very good contrast to the former, both states being extremes or types of emotional expression.

As the infant matures, it learns by hard experience that it cannot obtain all it desires. Due to the fact that in its nursing period its wants were so readily and rapidly satisfied, it would consider itself

and the environment as one, yet now greater and greater efforts are required to get that which was formerly obtained so easily. Now, of necessity, it comes to recognize that there is an outside world—reality—which, surely in certain respects, is hostile—hostile in the sense that what he cannot obtain, he looks at as being taken from him. Up to this time everything was his. Now, certain things are denied. If the infant readily learns to forego some things it desired, remaining at the same time a moderately contented child, it is beginning to learn its first great lesson. As a matter of fact, it is not at all uncommon, at least in some of the neuroses, to find that the opposite kind were bad (willful and obstinate) children.

We then have a normally maturing individual giving up not his instinctive impulses or desires, but the fulfillment of these instinctive impulses. It learns that what it wants it cannot have. The very young child does not realize that it may not, it knows that it cannot have this or that. And whoever deprives him of it is hostile to him. As Freud has pointed out, our childhood is a period of not unmixed happiness and pleasure, but one that has in it much of renunciation. Nor is the attitude of a child to its environment one of constant friendliness. Renunciation, dependent on compulsion, brings about an attitude of hostility.

Important for the development of my theme, is the fact that the child as it matures learns to realize that the concept "family" is strictly speaking artificial; that it does not exist in what, for lack of a better term, we call nature; that the concept "family" of necessity, and properly so, entails certain inhibitions otherwise not essential.

I may make what I mean clearer if I give an illustration: A family in which there already is one child, is increased in size by the arrival of a newcomer. What is the usual attitude of the first child? From personal observation or from what I have heard, very rarely indeed is the new arrival welcomed. Derogatory remarks as to its size or its capabilities; secret manifestations of jealousy or envy, up to frank hostility, expressed either in "I hope some one will take it away" or in manifestations of cruelty and acts of violence—such is the not uncommon reception the new arrival receives from the first born. Often is the latter prevented by force either from harming the former, *i. e.*, depriving it of its toys, or marring its pleasures. The first comer knows of no reason why others should now share his playthings and privileges of which up to now he was the sole possessor. Sheer necessity compels the child to give in and adjust himself to the inevitable. The ease and thoroughness of the adjustment are vital indications of later emotional health or sickness. Here again we see that renunciation is a big factor in the socializing of the child. Cultural development is essentially a renunciation of the fulfillment of instinctive animal or egocentric impulses—impulses which, manifest in the child, are looked at in an entirely different way when shown in an adult. Feelings of envy, hate, and jealousy are very prevalent among children, who, when quite young, say, under five years of age, rarely make any effort to hide these emo-

tions, not realizing their asocial or antisocial nature. Abundant proof exists that these feelings by no means disappear as the individual matures. Often, indeed, in adult individuals, they are felt, if not exhibited, toward members of the family, on occasions in many respects resembling early (infantile) incidents or experiences. Many adults, not all of them neurotics or patients, have informed me that, though they realize that these feelings are "wrong," and though they consciously do their best to eradicate them, yet they are unable to do so; implying thereby an unconscious source of the feelings, beyond the conscious knowledge or control of the individual. It is at this point that the concept "family" is a source of conflict to the child, who very early in life is taught that it must love and be kind to members of it. Only later does it learn that a similar attitude is requisite toward society in general. The pangs of shame and remorse, however, are greater when experienced as the results of a knowledge that such "unworthy" feelings are present in one in respect to a member of one's own family.

From still another viewpoint should the family be considered in development of the unconscious. I refer to the attitude of the child to the parents, as conceived of by Freud in what he has termed the parent complex. While it may be argued that this phase of an individual's makeup is concerned only in neurotic individuals, yet, as a matter of fact, analytical study of the human emotions has firmly established the close relationship between neurotic and normal. It has been said that we are all somewhat hysterical. How true this is, and what a deep foundation the statement has, has been confirmed by psychoanalysis. When, later in this paper, I attempt to give a definition of "unconscious," and also what our conception of neurosis is, I hope to be able to make the kinship of "neurotic" and "normal" clear.

But I must digress here to clear up a general misconception which has given no end of trouble. The acceptance of the meaning of the word sexual, in the sense in which Freud uses it (applicable to sex in childhood), is quite essential, in order that what I am about to say shall be given its proper value. Up to recent times, childhood and sex were never associated. Yet, if we believe our own eyes, or interpret in the proper way that which little ones do and say, we must be convinced that very young children are far from asexual beings.

To take gross examples: For instance, it has long been known that many infants even before the end of the first year are masturbators. Erections in very young children are often noticed by mothers and nurses. Can any deny the sexual nature of an erect organ? I do not mean to imply that to the young child an erection has a conscious significance identical with that in a child past puberty. I believe, however, that if we disregard the "sexual" nature of the phenomenon, and conceive of it as "pleasant" we can readily see why the habit, when established, is not easily eradicated. Habits, like thumb sucking in children (regarded as sources of pleasure), rather than as sexual, are on that account hard to overcome.

Sexuality in children has many manifestations. In no instance are they to be viewed from the adult conception of "sex." Some of them consist in looking, exhibiting, interest in childbirth, creation, as evidenced by playing "doctor," "father and mother," and by questions such as "Where do babies come from?" A desire to touch or handle the parts of his own or those of another is a frequent sexual manifestation.

Sex in children, then, is best described as an interest, a curiosity to see and hear; a sensation, not necessarily located in the region of the genitals, of something pleasant.

Only later in life are these various manifestations regarded as sexual. If they persist as such as ends in themselves (exhibitionism, etc.), they are perversions. If present in the form of symptoms in the adult, we say that the struggle between two forces—the insistence of the desire to be fulfilled as such—and another force (morality, etc.) which attempts to prevent a realization of the wish or impulse—this struggle has given rise to a compromise, and a symptom results. If, and this is what happens in normal individuals, the "looking" or "showing" impulse (to take but one manifestation only of the sex impulse) assumes its proper place in the individual psyche by reason of the same force—morality, etc.—then it (the impulse) manifests itself in some such way as an ability on the part of the individual to admire "beauty" in the human being without a concomitant sex feeling—or it enables him to create "beauty" in works of art—statuary, painting. In other words, the impulse is always present. The stage of the cultural development of the particular impulse will determine its manifestation—perversion the lowest stage—neurotic manifestation the next, and the highest is called its sublimation—that is, that form of conversion of an impulse in accord with a high standard of morality or development. All these processes take place quite unconsciously.

With this explanation we may return to consideration of the attitude of the child toward its parents. A mother told me a few days ago that her little boy, six years of age, said to her: "Mother, let father go to war. If he gets shot I'll marry you." Another mother informed me that her little girl of five said, "If you die, papa will be my husband." I wish to remark in this connection that these were two perfectly healthy, normal, lovable, and loving children.

Why do we psychoanalysts lay such stress on apparently innocent sayings? As a rule such remarks are passed off with a laugh or perhaps with a passing comment such as "What strange ideas children do have." However, only such things are strange which we do not understand. They lose their strangeness once we become familiar with their meaning.

"Being married," the state of marriage, to the observation of the child, brings with it certain prerogatives, pleasures, privileges, power and authority. To the child, the parents are wonderful, big, omnipotent beings, who have so many things which the child wants. The very young child instinctively realizes that these married "values" cannot be shared by a third party; that they are meant for the parents only.

The nature of these "values" is a contested point. We analysts maintain that they are essentially sexual, as determined by the choice of the child of the parent of the opposite sex. Is it not a significant fact—I call it a fact—that children always, to the best of my knowledge, choose the parent of the

opposite sex with whom the marriage is to take place? One might say that the child does not realize what it says; that it merely repeats what it sees in so far that it is a father and a mother—a man and a woman—that marry. That is very true. The child does naturally wish to repeat what it sees. It sees that only two—a male and a female—can be married, and that if there be a third party, obstructing the consummation of a marriage, that third party must be set aside, done away with. That accounts for the frequent death wishes evidenced by children, to whom, as Freud pointed out, death really means a going away, and is devoid of the immoral or criminal quality of the wish or act which the adult attaches to it. For this reason children often give expression to these thoughts. Adults usually disguise or conceal them. Instead, they give vent to them in their dreams, or resort to vague, disguised, secretly guarded fancies in which they fulfill these wishes.

The sexual nature of the wish consists, then, essentially in the choice of the opposite sex. The bitter hostility at times manifested between mothers and daughters, or fathers and sons, in adults, has its roots in this unconscious sex selection, with feeling of rivalry (also unconscious) present for the parent of the same sex. It is a well known fact that mothers and sons, fathers and daughters (opposite sexes) as a rule get along much better and show evidences of stronger friendships or ties for each other than do those of the same sex. This is no mere accident; such a widely prevalent phenomenon must have causes for existence. It is also well known that, as a rule, a brother and a sister get along better together than do two sisters or two brothers.

It is well known among naturalists that males in a herd of animals do not get along well together, and that contests for supremacy are very frequent, also that the conqueror is the head of the herd. The contest has a sexual basis, inasmuch as the victor maintains a sexual monopoly. The same impulse is present in modern society. The renunciation of this impulse is a basic factor in the constitution of the family. All children live under one roof until they are ready to build a home for themselves, then they leave of their own accord. However, conditions in a family are not always so ideal and peaceful. Quarrels, often bitter, between father and son, or mother and daughter, are not uncommon. We psychoanalysts believe, as do others who arrived at this conclusion without psychoanalytical study, that the unconscious sexual rivalry is a by no means unimportant factor in the discord.

It is also well known that a father and son are less frank or less at ease in each other's presence than a father and daughter, or mother and son, which is explained on the basis I have pointed out.

To say that the feeling of rivalry on the part of the child toward the parent of the same gender is a sexual one by no means explains the situation. If we conceive of the child's sexuality as manifested in the way I have pointed out, we are in a position to understand the child's attitude. I take in detail this sexual rivalry, and attempt by analysis to get into the psychic processes of these little ones.

The desire on the part of a child to be itself a parent is very strong, as manifested in games (playing "house") in which adult activities are reproduced. In this way the child fulfills its wishes as nearly as reality will allow. In these games it pos-

sesses all the privileges (in fancy) which the real parent possesses. It is the head of the "house"—i. e., as father or mother. It may command the "children" to do its bidding. It may inflict any punishment on the "children" that may seem advisable. In such games children very often indulge in all sorts of "improper" practices, as, for instance, viewing each other's genitals; or discussing or watching each other's excretory activities (urination and defecation). They frequently "make believe" that they give birth to babies, for whom they care (nurse and cleanse) as the elders do for little ones. The children at play feel themselves at liberty to indulge in the "secret" things of which they have often heard that children must not know. While I am well aware that such are by no means the only games in which children indulge, yet they are typical manifestations of childhood's activities and expose to us evidences of important psychic processes.

The foregoing, in brief, depicts what we conceive to be sexuality—the sexual impulse if you will, of very young children. In no way does it coincide with the adult conception of sex, and that is why Freud used the term "infantile sexual theories."

What we psychoanalysts mean by the sexual infantilism of the neurotic is the persistence in him of these impulses as manifested in his symptoms and general emotional attitude. Psychoanalysts feel that the emotional make up of the individual, as evidenced by feelings of hate, envy, jealousy, love, etc., is dependent on his (unconsciously determined) sexuality.

It is the pleasure that an indulgence in these activities—this sexuality—will bring to the child, in addition to other privileges, which creates the sexual rivalry between parent and child of the same sex. This constitutes the "parent complex" of Freud, an emotional constellation lying at the root of all neuroses.

We can now formulate a definition of unconscious in terms of psychoanalysis—psychoanalytic because it was primarily through his psychoanalytical work that the existence of this aspect of the human psyche became evident to Freud. To us, then, the unconscious constitutes a vital element in the psyche of all individuals. The content of the unconscious of the adult represents instinctive desires and impulses (wishes, in the meaning of Freud) which at one time in the early life of the individual, were conscious, but which on account of his cultural development as he matures, he has realized to be inconsistent, not in harmony with standards of society. As the individual matures he learns that certain things are wrong or shameful, and, wishing to conform to standards, to be, at least in essentials, like other people, he banishes into the unconscious those impulses which he has learned are forbidden.

All individuals of necessity go through this process of growth. On its success depends psychic adjustment. We say that the normal has succeeded. The neurotic has only partially succeeded, in that he maintains his station in society at the expense of emotional health. He is going through the same struggles as the normal in his attempt to renounce the fulfillment of these impulses, but for some reason he is not perfectly successful. The unconscious

impulses are strong, and in the struggle between yielding to the unconscious wish and striving against it, emotional illness (a neurosis) has resulted. In the pervert (or criminal) the impulses—to commit what is regarded as an antisocial or asocial act of whatever nature—have come to the surface as such, and we say that the attempts at renunciation have failed. Those impulses, which in the neurotic and in the normal are unconscious, are in the pervert or criminal carried into conscious execution.

It is this conception of the nature of the unconscious, in its application to such vital psychic activities that renders it of great import. Whether we accept the psychoanalytical conception of the unconscious or not, we surely owe a great deal to Freud and his coworkers for pointing the way in our researches concerning the deeper psychological life of the individual.

40 WEST EIGHTY-FOURTH STREET.

DIATHESES IN CHILDREN.*

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The conception of constitutional difference to the predisposition of disease has always attracted the attention of the medical profession. Galenus (131-210 A. D.), the founder of experimental medicine, speaks of the importance of diathesis in disease. A Persian physician, Rhazes, discussed predisposition and susceptibility to disease a thousand years ago. Dr. Thomas White (1782) also described an inflammatory diathesis.

With the discovery of pathology and bacteriology, particularly the latter, we thought we had reached the goal. The old notion of diathetic disease had to give way to the more modern conception of disease. Most ailments were supposed to be due to some living microorganism—the animal or vegetable parasite was the cause—the disease, the effect.

But we were soon disappointed, for some problems presented themselves which we could not explain. Why was it that when two healthy persons were exposed to the same infection, as for instance the harboring of pneumococci in the throat, one escaped the disease, the other contracted it once or several times? Furthermore, two children nursed by apparently healthy mothers—chemically the milk was perfect and plentiful—one child was always strong and healthy, the other did not thrive and showed symptoms involving the digestive tract, the nervous system, skin, lymphatics, and was subject to colds, etc.

Similar strange phenomena may be cited which frequently occur in nevous and skin diseases. Immunity may fortify one against some morbid processes, but disease and heredity yet offer a large field for investigation.

To hide our ignorance we invented certain terms—lack of resistance, incapacity for adaptation. But by what criteria could one gauge these defects?

There seems to be some underlying definite cause or manifold causes, perhaps some structural variation in individuals, either congenital or acquired, which predisposes one to a certain disease and not the other.

At the end of the last century, we began to blame the ductless glands for a great many diseases. Some endocrinologists claim that a disorder in the hormonal equilibrium will predispose one to almost any ailment, even a microbic disease. As yet our knowledge of the internal secretion is rather rudimentary and even confusing. The profession has appealed to the physiological chemists to solve some of these mooted problems. While they are trying their utmost there is still much left to be achieved.

Pediatricists are greatly responsible for the rejuvenation of the discarded term "diathesis." They are the ones who could not help but notice some pathological disposition or morbid temperament in the individual which is transmitted from one generation to another. Although many types of diathesis have been described, the following are the most important:

1. Status thymicolymphaticus (Dr. A. Paltauf, Dr. Escherich).
2. Exudative diathesis (A. Czerny).
3. Neuroarthritic diathesis (Comby and others).

PATHOLOGY.

Status thymicolymphaticus.—Bartels in his monograph on Status Thymicolymphaticus and Hypoplasticus (1912) has made many autopsies on children and makes three degrees of comparison of the lymphatic apparatus, subnormal, normal, and super-normal, the last of which is equal to lymphatism. So common is this condition that traces of it are present in over half of all autopsy material. This author is able to state that at birth the lymphatic apparatus is practically undeveloped, but rapidly acquires its maximum development in the first decade of life. Then decade by decade it recedes until in old age as a rule it is but feebly present or absent. The thymus, if it does not undergo involution in the first year, slowly diminishes with the development of the lymph nodes. If still persistent at puberty, involution may be arrested for a time, now and then being resumed. As a rule, in the female, there is no involution in the first year and no arrest of involution at puberty. In girls the status lymphaticus is often associated with hypoplasia of the genital apparatus, while in boys the testicles only may be hypoplastic.

Closely allied to the status thymicolymphaticus is the so called status hypoplasticus in which to the enlargement of lymphatic and lymphoid tissues are added numerous other peculiarities, together with a tendency to the development of certain diseases. While this subject is a fascinating one it is not entirely pediatric in scope. Many children are born with malformations, such as patent foramen ovale, and also show a remarkable tendency to tumor formation, as glioma of the brain. An American, Nesbitt (*Medical Record*, 1908, lxxiv, 615), who made an exhaustive genealogical study of malignant disease and diathesis, has confirmed this statement about malignant tumors in childhood, for not only

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were the sarcomatous children of the lymphatic habit, but cancer had occurred to a surprising degree in their direct and collateral progenitors.

While lymphatism is supposed to be most common in children, still no age is exempt from it. Stoerk and Horak, in their book on Lymphatism (1913), cite that Austrian military physicians who examined 300 healthy soldiers from different regiments found that 112, or thirty-seven per cent., showed some symptoms of lymphatism and thirty-six, or twelve per cent., showed typical symptoms of lymphatism. Miloslavich (*Virchow's Archives*, 1912, Vol. 3, p. 208, Book 1) found among the autopsies on soldiers who committed suicide while in the army, that eighty per cent. presented marked evidence of typical lymphatism. The late Doctor Ohlmacher devoted years to the study of autopsy material of this constitutional state, but his work was confined largely to adults. He found that the thymus gland had been enlarged in eighteen cases of epilepsy. D. Summers (*American Journal of Diseases of Children*, December, 1914, Vol. xiv) says that among the first 4,000 necropsies at Bellevue Hospital, status lymphaticus was encountered in 249 subjects, or in about 16 per cent. Besides structural defects and hyperplasia in different tissues, the thymus was enlarged in 118 cases.

C. McNeil and J. P. McGowan (*Edinburgh Medical Journal*, 1913, page 201) have studied febrile conditions, mostly pneumonia, occurring within many years in a boys' industrial school near Edinburgh. Of the twenty fulminant cases, twelve died within a day and all within two days. In fourteen cases, where autopsies were made, various lymph-glandular tissues of the body were found enlarged. In five cases, the thymus was found markedly enlarged. They advanced the hypothesis that in a great many diseases where the patients die within a few days of the onset of the illness, they have belonged to the morbid diathesis lymphatism.

The exquisite familial nature of status thymicolymphaticus has been shown in a number of episodes, and the entire subject is covered by Bierring, Goodrich and Glomset in the *American Journal of Diseases of Children*, 1913, vi, page 75. Attention is seldom drawn to these families save in connection with sudden death in one or more of the children. In the article cited, the four children of the family all died suddenly from trivial causes, aged from two to seven years. All were fat, flabby, pasty looking, with enlarged tonsils and adenoids, enlarged palpable lymph nodes and thymus and the so called potbelly of rickets. All were nervous and excitable, which leads me to remark that the lymphatic diathesis must not be confused with the lymphatic temperament naturally associated with phlegmatic behavior.

At least five other reports have been published on these multiple family deaths, and of these three were if possible still more tragic. In one report, one family of seven died in childhood and in another nine out of eleven children. I recall several cases of constitutio lymphatica with sudden death. During the time I was intern at the hospital, a male child two and a half years of age was to be operated upon for empyema. The ailment was not severe, the

child did not present any special symptoms, except that on aspiration an hypodermic barrelful of pus was withdrawn. The surgeon was preparing for the operation and no sooner was the chloroform mask applied than the child suddenly succumbed. There was a history of laryngitis and occasional fainting spells. The parents told that an older child was also lost from some trifling ailment.

There was still another family, whose child, two years old, had a very mild attack of bronchitis, and died suddenly on the third day of its illness. Two years later, a second child had a mild attack of false croup and when the doctor applied the tongue depressor in order to examine the throat, the baby gasped and died. I was hurriedly called in on the scene. These two children had been under my care since their birth. They were both nursed by the mother until twelve months and the older child had suffered frequently with laryngismus stridulus, while both had had various skin diseases since birth. The mother told me that she herself had had scrofulosis during childhood. No autopsy was performed of any of these cases.

Exudative diathesis—so much has been written on this subject since Czerny first propounded it and so many additions and variations have been introduced that it will be well to adhere as far as possible to Czerny's own conception of it. Originally it was very largely a condition recognizable in the nursling, although tending to persist throughout childhood. As Czerny expressly states, it is not the same as the status lymphaticus. The conditions are quite dissimilar although they frequently coexist. A little reflection will teach us that this must be so, for, while the exudative diathesis stands out conspicuously in nurslings the status lymphaticus as we have already seen is dormant during this period. The enlarged lymph nodes in exudative diathesis are not primarily but secondarily enlarged as a result of inflammation of the scalp, face, nasopharynx, etc., the skin and mucosæ showing an extreme vulnerability to irritants of all kinds. These membranes are believed to possess a special succulence through which comes the tendency to exudative inflammation. One explanation of this succulence, an insufficiency of the absorbents, would appear to associate it with the status lymphaticus, but, as we understand it, the anomaly, if one exist, is not associated with the lymphatic apparatus but with the capillary circulation. When Czerny first introduced his diathesis into clinical medicine it was with a very practical aim. Apparently well nourished nurslings with intact stomachs and intestines and the best foods failed to keep well. They suffered constantly from certain skin affections and troubles of the upper air and food passages. The discovery was made that fat intolerance was marked and that protein intolerance was also present in a less degree. Great improvement followed the use of a spare diet consisting in the main of carbohydrates. Even the best breast milk was of no avail, because of its fat and protein contents, and no laboratory milk could be devised to meet the indications.

Although, as already stated, these children are for the most part plump, and apparently well nourished, there is an actual emaciation with an effluvia of

i. e., during the early weeks of life the infants are under weight. Oddly enough their diathesis is not manifest until they attain normal weight. It is at once evident that these children are sharply differentiated from those whose ill health is due to defective nutriment and to gastroenteric disturbances. The expression of ill health is the diathesis itself, which is, therefore, more conveniently regarded as a disease, or rather a series of disease pictures, than a disposition to disease. To enumerate a vast number of symptoms which occur equally in part in other conditions is to run the diathesis into the ground and only confuses the beginner. We shall do better if, with Czerny, we pay especial attention to leading features which actually characterize it.

Czerny goes deeply into the nature of the secondary lymph node hyperplasias as indications of local manifestations. There may be a marked reaction to a slight inflammatory disturbance, even propagated in distant ganglia, or only a moderate reaction to a severe inflammatory process. In the nursing, before the status lymphaticus can appear, the eruptions of the face and scalp and deep seated infection in the nasopharynx can cause clinical scrofula by exciting hyperplasia of the nuchal, submaxillary and anterior cervical glands. But so complicated are the relations between these swellings and the status lymphaticus on the one hand and gland tuberculosis on the other, that they can hardly be considered in this paper. Among the subjects on which Czerny dwells at great length is the neurotic element, which is practically always recognizable, and the character of the subcutaneous tissue and skin which gives rise to the so called pasty look. As I understand it, both these elements are characteristic. All dermatologists are aware that itching and scratching play a great rôle in eczema, and a vicious circle may be seen in full play in the eruptions of these children. The opinion is often expressed that if the hands could be kept tied eczema would often present only minimal lesions. The so called strophulus or lichen urticatus which is so often present in these children may be entirely artificial. Without stating the exact rôle played by itching in this eczema Czerny appears to regard itching and scratching as an essential feature and the first notable nervous manifestation of the diathesis. Akin to this are the spasmodic affections which accompany the manifestations in the upper mucosæ, such as false croup, asthma and perhaps spasmodic cough. These manifestations should not be classed under spasmophilia, because they are always secondary to some inflammatory local disturbances. As the child grows up, nervous or rather neuropsychic disturbances become strongly in evidence. No one goes so far as Czerny in emphasizing this element. In addition to all the phenomena exhibited by the neuropathic child, as bedwetting and night terrors, there is a profound secondary reaction to faulty environment. This occurs because the numerous symptoms caused by the diathesis have made of the child a semi invalid. He cannot attend school or play with other children. So powerful is this element that psychotherapy becomes an essential part of the treatment. The child should be isolated from all adults save a specially qualified nurse who will divert but not coddle him,

and he must associate with children of his own age. In this way he loses a tendency to selfstudy and introspection. Psychotherapy seems as essential to the older child as diet is to the nursing.

Czerny believes that the psychopathic child usually exhibits hyperplasia of the tonsils and adenoids. Those who have accused the latter of interfering with the mental processes (aproxesia) have, he thinks, put the cart before the horse. The pasty habitus and its relation to diet are discussed at great length by Czerny. To a certain extent, paradoxical as it sounds, these children suffer from over nutrition. Czerny even asks whether an excess of protein and fat does not favor, if not actually cause, hyperplasia of the tonsils and lymphoid tissue in general and the enlarged lymph nodes. He appears to regard this element as on a par with the usual defense reaction. At any rate, on a changed diet, these hyperplasias tend to recede. In my opinion this conception rather belongs to the status lymphaticus, for, in this affection, the children are also plump and seemingly well nourished and good feeders. The so called pasty habit is also marked in the status lymphaticus. An ordinary fat baby need not be confounded with the pasty child, for the pastiness is not in evidence; the flesh is firm, color good and there is no hyperplasia of any of the lymphoid structures. An important point is the family behavior in regard to fat. The merely fat infant may come of a stock inclined to obesity. The pasty fat child, on the contrary, usually comes from a lean stock. To show pastiness a child must be fat; there is no such creature as a thin pasty child, nor can it be shown in an average plump child. Unlike mere corpulence, pastiness responds quickly to an altered diet, showing that it is an acquired state. Also, it can be kept away by diet. Czerny goes so far as to state that lymph node hyperplasia at once calls for restricted diet. Perhaps herein lies a fundamental difference between exudative diathesis and status lymphaticus, although Czerny is somewhat obscure, and seems to contradict himself—for in one place he states plainly that the two are distinct, and in others speaks as if they were practically the same, *i. e.*, the pasty state seeming common to both.

In addition to special invalidism, the child with the exudative diathesis is prone to contract the various infectious diseases, often in a severe form. As a result numerous symptoms are added to his diathesis and this may account for the vast total of symptoms attributed to the diathesis *per se*. Czerny, in speaking of the tendency to take cold easily, claims that exposure is not necessary to produce it, which is one of the many arguments against coddling. Czerny's disciples and successors have added certain dogmas. For example, we find the statement that in rural life affections of the respiratory tract are not found. In other words, if the rural child has the diathesis these symptoms are missing. We also are told to believe that extirpation of the enlarged lymphoid structures (adenoids and tonsils) will not modify the manifestations of the diathesis. Objective criteria for the exudative diathesis are naturally desirable. Czerny is convinced that the adipose tissue of the pastous child differs from that

of the normal child. Microscopically, there are no noticeable differences, but it is not unlikely that differences are noticeable in the chemical analysis. Several years ago, Czerny announced that he would eventually make a report on this matter as a result of his extended studies, but if such a report has ever been made contemporary writers make no mention of it.

An alleged objective criterion of the diathesis is the so called Rachmilovitch reaction. The latter scarifies the skin and rubs in a paste composed of Colman's mustard with water; in half an hour a red wheal appears with serum exudation in the scarifications. After two hours the serum dries into yellow crusts. By the second day the lesion is already less prominent but it may persist for a considerable time (in fat children from fourteen to eighteen days). The wheal remains at its maximum development from two to four hours. When positive, this reaction appears to be diagnostic; while its absence does not exclude the diathesis. While the discoverer reports one hundred per cent. positive, he finds others obtain not over twenty per cent. There is no reason, *a priori*, why such a skin should not offer a peculiar behavior to irritation.

The need of a biometric criterion of the exudative diathesis is also shown by the research for typical blood counts, urinary analyses, etc. In regard to eosinophilia, this is probably a separate peculiarity which is often associated with exudative diathesis, especially in eczema cases. Engman and Weiss (*Journal of Cutaneous Diseases*, 1916, xxxiv, page 739), working upon the theory that fat metabolism is disturbed in this diathesis, made extensive studies of the blood for acetone bodies. Naturally the possibility of acidosis is not considered in such a connection, and a slight average increase over normal may suffice to show that fat metabolism is affected. The authors first obtained average figures in normal subjects, after which they investigated nine cases of frank exudative diathesis. The average yield of acetone bodies in the blood was notably higher than in normal controls, although well below the figures of diabetic acidosis. In individual studies a normal child may exceptionally show as high an increase as the average among exudative subjects.

Neuroarthritic diathesis.—The nervous phenomena said to accompany or enter into the exudative diathesis vary much with individual writers. Many mention spasmophilia in the narrower sense as a common accompaniment of both status lymphaticus and the exudative diathesis. Others mention simple nervousness not amounting to neuropathy as complicating various symptoms—for example, intense itching in association with eczema, asthma with respiratory disturbances. Finally, true neuropathy, even psychopathy, is sometimes mentioned in this connection as expressed by night terrors, bedwetting, fear reactions, persistent crying without apparent cause, etc., and to these may perhaps be added vagotonia as a vasomotor nervous syndrome.

Further, the predominance of a neurotic element has caused writers to make two forms of the exudative diathesis. One corresponds roughly to the

torpid form of scrofula and the other to the erethetic form as described by old clinicians. In the former at least, the children seem to be well nourished, while, in the latter, they are spare. Such a distinction is not universally recognized. Engmann and Weiss, who have analyzed the literature carefully, state that, as a rule, children with the exudative diathesis are neurotic and come from neurotic stock. Grulee considers spasmophilia quite apart from the exudative diathesis. His descriptions of the former quite exclude the latter. Spasmophilia is never seen in breast fed children and spasmophilics develop carbohydrate intolerance.

If this affection be considered in its narrower sense and not extended to include other types of nervousness, it can hardly be regarded as a part of the exudative diathesis. Comby's neuroarthritic diathesis, accepted by a few clinicians in other countries than France, may serve to explain the constitutions of many children who have been fitted into the conceptions of exudative diathesis. Such children may be descended from arthritic progenitors and may themselves become arthritic in adult life. Unlike those with exudative diathesis they have many ailments of the gastroenteric system—anorexia, pica, bulimia, fetid breath, atonic dyspepsia, colic, constipation, mucomembranous enteritis, appendicitis, etc. Such symptoms should differentiate them completely from the child with exudative diathesis, in whom the gastrointestinal tract seems singularly quiet.

These children are prone to have daily fever coming on late in the day and persisting perhaps for weeks and months. Tuberculosis is readily excluded by negative von Pirquet tests. Of nervous symptoms, headache is common, sometimes with the suggestion of meningitis. A syncopal tendency is mentioned; also palpitation and tachycardia. The watery blood, enlarged cervical lymph nodes and respiratory affections agree with these seen in the exudative diathesis. Spasmophilia and neuropathy are apt to be present. Orthotic albuminuria and cyclical vomiting may occur. It is of course a simple matter to regard this neuroarthritic diathesis as one expression of the exudative diathesis, and this is what has generally occurred.

P. Sittler* (1913) is the only one who would combine all diathesis into one, and he considers the frequency of exudative diathesis with its neuropathic manifestations nowadays as a physiologic reaction to a faulty mode of living. He includes spasmophilic manifestations as part of the diathesis and numerous symptoms usually regarded as psychopathic, as habit spasms of all kinds, night terrors, enuresis nocturna and severe headaches. Elsewhere he speaks of erethetic children of slender build, delicate skin, impressionable nervous systems and, in this connection, of vagotonia, but is silent like the great majority as to an arthritic element. These who are interested in the neuroarthritic diathesis will find it described in great detail in *Handbook of Children's Diseases*, Pfaunder and Schlossmann, which can be read in an English translation.

50 EAST NINTH AVENUE, NEW YORK

*Die exakt. Kinderheilkunde. Wiesbaden.

HOW THE HEALTH DEPARTMENT MAY AID IN DIAGNOSIS AND TREATMENT OF MENINGITIS.*

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There are many who are not yet familiar with the work done in the meningitis division of the Department of Health, which was established by Doctor Park over seven years ago.

This division consists of a staff of physicians specially trained in the diagnosis of meningeal conditions, the technic of lumbar puncture, the treatment of meningitis and the interpretation of spinal fluid examination with a laboratory for the examination of spinal fluids withdrawn by ourselves and also those sent in by private physicians and hospitals.

As all forms of meningeal involvement are comparatively rare except in times of epidemics of meningitis or poliomyelitis, it is to the advantage of the general practitioner to have specialists in the diagnosis and treatment of such conditions upon whom he may call. While the administration of diphtheria antitoxin is a rather simple matter and the dosage is fairly well established and constant, the technic of lumbar puncture and the administration of anti-meningitis serum is much more complicated, the outcome of the case depending in no small degree on the experience of the physician in dealing with meningitis. It is also to the advantage of New York City to have such specially trained physicians to assist in the epidemics of poliomyelitis and meningitis which arise from time to time.

We see a patient with the physician in charge of the case for a number of reasons. First, we wish to work with the private practitioner, not to encroach in any way on his practice, and of course a diagnosis can be more satisfactorily reached in consultation. Moreover, the treatment of cases of epidemic meningitis requires the closest possible co-operation. Secondly, doing a lumbar puncture and administering serum with the necessary aseptic precautions requires more assistance than the family can usually give, and the presence of their own doctor makes them more ready to submit to a procedure which is, to them, more or less terrifying. Thirdly, if the patient is very ill and dies a few hours after the puncture, the family is better satisfied if their own physician has agreed with us as to the advisability of the operation. All cases of suspected meningitis or poliomyelitis reported to the borough offices are referred to us, whereupon we call up the physician and offer to see the patient with him if he so desires. Considerable time may be saved if physicians, wishing us to see a patient, call up the meningitis division located at present at the Research Laboratory of the Department of Health. This does not take the place of the report to the borough office. Spinal fluids withdrawn by the physician are examined at the laboratory and a report telephoned. To secure prompt and satisfactory results, the fluids should be collected in a sterile container and sent immediately, by messenger, to the laboratory.

Fluids should never be left at the stations, as delay results and the fluids are usually unfit for examination when they reach us. While we are constantly on call, it is desirable that night and Sunday calls be reserved for real emergencies, as the force is small and a car is at our disposal for only three or four hours a day. By emergency cases, we mean those that have been taken acutely ill within a few hours. Cases of several days' standing are not endangered by a delay of a few additional hours in the administration of serum. I must confess to a feeling of some annoyance when I am called around midnight to see a case of tuberculous meningitis that has been sick about two weeks.

The cases fall mainly under four heads.

1. *Tuberculous meningitis.*

2. *Purulent meningitis.*—Including epidemic meningitis, due to the meningococcus, also meningitis caused by the pneumococcus, streptococcus, influenza bacillus and staphylococcus, and occasionally by other more unusual organisms.

3. *Poliomyelitis* and

4. *Meningism* with a variety of conditions, most commonly with pneumonia, gastrointestinal disturbances and acute infectious diseases. By meningism we mean that condition in which meningeal symptoms arise in the course of some disease, the cerebrospinal fluid being increased in amount, but usually normal in character.

Of course, we have other rarer conditions, such as brain abscess, brain tumor, syringomyelic, and syphilitic conditions of the central nervous system of which, however, we have seen comparatively few.

The differential diagnosis of the condition is based on the history of the case, the physical signs and the examination of the spinal fluid.

There is not sufficient time to discuss the history and the physical signs except to emphasize the point that in most cases it is very difficult indeed to feel even quite sure of the diagnosis without a lumbar puncture. The diagnosis of meningitis or meningeal irritation in infants is particularly difficult. An unexplained temperature, a bulging fontanelle, and a tendency for the head to fall back when the child is held in a horizontal position are sufficient indication for a lumbar puncture. In older children and adults, the signs of meningeal or cerebral involvement (headache, stiffness of the neck, delirium or stupor, Kernig, Brudzinski, Macewen, changes in the reflexes, changes in the pupil, etc.) are more easily elicited, their presence giving indication for lumbar puncture even though it is strongly suspected that they indicate only a meningism as the cause of a pneumonia, otitis media, etc. In the first place, if the condition is only one of meningism, the relief of pressure has considerable therapeutic value. In the second place, the signs may be due to a true epidemic meningitis, even though we have suspected that the case was only a meningism, or, if a meningitis, have inferred that it was secondary to the pneumonia or otitis media, and, therefore, was caused by a pneumococcus or streptococcus. The opportunity of treating a case of epidemic meningitis early should not be allowed to escape.

There is no special reason for delaying a lumbar puncture if there are good indications for doing one

*Read before the Medical Association of the Greater City of New York, November 19, 1917.

When done well, and with careful asepsis, it is neither dangerous nor particularly painful. I always hesitate a great deal about performing a lumbar puncture on a patient with a bad heart. In one such case the patient died very suddenly during the operation, with symptoms of a pulmonary embolism. This is the only instance of a death during or immediately following the puncture in my own experience, or, I believe, in that of the other members of the division, altogether, we have done about 4,000 lumbar punctures. We are warned against withdrawing much fluid in cases of suspected brain tumor on account of the danger of the medulla being pressed down into the foramen magnum.

In making a lumbar puncture, general or local anesthesia is not used. We think that general anesthesia is dangerous, and local anesthesia takes so much preparation and time that the overcoming of the pain does not compensate for the increased nervous tension on the part of the patient. Adults not acutely ill who submit to lumbar puncture for diagnostic purposes do not seem to mind much. The back is not very sensitive, and if the patient is held properly—lying on the side with the knees drawn up against the abdomen, the neck bent and the back well arched so that the intervertebral space will be as great as possible—with a skilful operator there is very little pain. Never, under any circumstances do we do it with the patient sitting up. Iodine is used over about four square inches immediately around the point of election for puncture and a sterile or bichloride towel is laid over the hips through which to find the landmarks.

The hands of the operator are scrubbed and disinfected with bichloride and every precaution is used to secure asepsis. When we consider how fatal is the result of an infection of the meninges with the staphylococcus, for instance, the importance of great care will be seen. We have never had a secondary infection of the meninges. A Quincke needle, size 15 or 16, is used, and the puncture is made in the midline through the notch most nearly coinciding with a line drawn from crest to crest of the ilium. Great care should be taken to have the patient securely held in a proper position. If the patient is delirious it may be necessary to make a rope from a sheet and pass it back of the neck and under the knees.

In doing a lumbar puncture, much depends on the skill of the operator. While a beginner may be occasionally perfectly successful, an experienced operator may fail to go into the canal at the first attempt or may get a bloody fluid, especially if the patient is not held well the average of satisfactory punctures will be about in proportion to one's experience. The most difficult type of case is that of a very young infant without increased fluid. In these cases, the dura, not being distended by fluid, is carried in front of the needle, so that as we finally penetrate it, we often hit the wall of the canal and get a bloody fluid. In some cases of this sort a very small, sharp needle seems to work better, but in general we get blood much oftener with a sharp than with a rather blunt needle, and a very small needle is unsatisfactory if the fluid turns out to be purulent.

A normal spinal fluid is perfectly clear, and when drawn with the patient in a horizontal position, it

flows slowly, drop by drop, perhaps ten to fifteen drops a minute. The rate of the flow varies with the calibre of the needle used and with the resistance offered by the patient. Struggling and crying will increase the flow. In pathological conditions the fluid is practically always increased in amount. It may be either clear or cloudy.

A clear fluid increased in amount usually indicates tuberculosis meningitis, poliomyelitis or meningism, syphilitic involvement of the central nervous system, brain tumor or rarer neurological conditions. A clear fluid occurs very rarely in meningitis within the first twenty-four hours of the disease. A slightly cloudy fluid is sometimes found in rather acute cases of tuberculous meningitis and in poliomyelitis. A cloudy fluid usually indicates, with the above exceptions, an invasion of the meninges by the meningococcus or another pyogenic organism.

In the routine examination of fluids, cytological bacteriological and chemical studies are made. A Wassermann is done, if there is any suspicion of a specific infection and the gold chloride curve may be determined in special cases. Guineapigs are inoculated with fluids from suspected cases of tuberculous meningitis.

In a normal spinal fluid there are a small number of cells perhaps up to 20 c. mm., a faint trace of albumin and globulin and sufficient glucose to give a good reduction of Fehling's. In poliomyelitis the cells are increased in varying degrees, usually showing a preponderance of mononuclears, there is a varying increase in the albumin and globulin and the Fehling's is usually reduced as well as with normal fluid. Rarely fluids show exceptions to these general rules. In tuberculous meningitis the cells are increased, the mononuclears generally predominating, the albumin and globulin are increased more than is usually the case in poliomyelitis and the reduction of Fehling's is ordinarily not so good. Early in tuberculous meningitis the reduction of Fehling's may be practically normal and the tubercle bacilli being difficult to find at this time, it may be quite impossible to determine from the fluids which condition is present. As we see cases of tuberculous meningitis, the tubercle bacilli are demonstrated in the smears in about eighty per cent. of the cases. The diagnosis is made in doubtful cases by inoculating guineapigs.

In purulent meningitis the cells are of course greatly increased with a preponderance of polymorphonuclears. As epidemic cases improve, the percentage of mononuclears increases. The albumin and globulin are usually moderately to greatly increased. In recovering cases of epidemic meningitis, these usually decrease as the inflammatory reaction subsides, but they have rarely returned to normal by the time treatment is stopped. Early in some of the cases of purulent meningitis there may be a fairly good reduction of Fehling's which disappears as the condition becomes worse. If a case of epidemic meningitis is fairly mild the reduction may remain good all through the disease. On the other hand, in many cases, it disappears at the height of the disease, to return as the patient improves. We have come to place upon the reduction of Fehling's as being of great prognostic value.

In cases of purulent meningitis the specific organ-

ism producing the disease may be isolated in practically all cases, though not always from the first fluids when the cases are seen early.

It must be borne in mind that, except for the purulent meningitides or tuberculous meningitis, where the specific organism can be demonstrated, an examination of the spinal fluid does not *make* the diagnosis, though its aid is often indispensable. Like most other laboratory procedures the results must be carefully correlated with the history and physical signs, and in some instances more than one examination be made. Not infrequently its value lies in ruling out certain conditions, for instance, if we find a perfectly normal fluid, we know we have *not* a meningitis nor a poliomyelitis. Then, too, there are border line reactions that are hard to read. It is occasionally difficult to say, for example, whether the albumin and globulin are very slightly or not at all increased. Fortunately, these somewhat indeterminate results are very rare.

When the fluid withdrawn is cloudy, antimeningitis serum is always injected at once, even though it is suspected that some other organism may be the cause. The serum does no harm no matter what the organism may be, and if it is epidemic meningitis the earlier the serum is administered the better. Later treatment depends on the examination of the cerebrospinal fluid. We have used streptococcus and pneumococcus serums in appropriate cases. No patient with pneumococcus meningitis directly under our supervision has recovered, but we know of two patients who did. One with streptococcus meningitis recovered, but none with influenzal meningitis. Antinfluenzal serum furnished us by the Rockefeller Institute has been used in a few cases without success.

As stated above, if the first fluid is cloudy we inject antimeningitis serum. It is warned to body temperature and injected very slowly by gravity under the least possible pressure. This method was introduced by Koplik. A syringe is dangerous and is probably responsible for many deaths following the administration of serum.

The gravity method is also valuable as a guide to dosage. While it is generally best to give not more than twenty cubic centimetres of serum even if a large amount of fluid is removed, and while the dose should usually be less in amount than the fluid, there are cases where it seems necessary to give more than twenty cubic centimetres and there are others where the amount of fluid is small and it is desirable to inject a larger amount. In these cases, the ease with which the serum flows in by the gravity method is a valuable index of the size of the dose that may be safely administered. The size of the dose depends very little on the age of the patient. A very young child can usually be given twenty cubic centimetres if a large amount of fluid is withdrawn. During the first two years it was customary to give larger doses of serum at the start, often thirty to forty cubic centimetres, but a number of times during or immediately after the injection the patient went into shock. At present it is the custom of the division to give not more than twenty cubic centimetres of serum for the first two or three doses. If the patient fails to improve,

the dose is cautiously increased if it runs in easily by gravity.

We have seen a number of cases of undoubted dry taps during the course of cases of meningococcic meningitis. The serum ran in freely and showed the usual variation in movement depending on respiration. In such cases it is advisable to proceed very slowly and to watch the patient carefully for the slightest change in pulse and respiration. We think that possibly in some cases the exudative period is followed for a short time by one of decreased secretion. At any rate, a dry tap is frequently followed by one in which fluid is obtained. In cases with thick exudate that will not flow through the needle, gentle suction with a syringe may be tried. Of course a dry tap may be due to a basic meningitis.

In no case of well defined basic meningitis under our observation has recovery taken place. At first we tried very hard to get such patients into hospitals for ventricular puncture, but as they all died we do not now urge it very strongly. The diagnosis of basic meningitis should not be made, we feel, on the occurrence of two or three dry taps. We have had a number of cases in which several dry taps occurred that cleared up. We have seen one case in which after one or two dry taps ventricular puncture was resorted to, with recovery. On account of our own experience with several such cases, which cleared up under the more conservative treatment, we did not feel that the recovery should be attributed to the ventricular treatment. We feel that ventricular puncture is not a procedure to be resorted to without very clearly defined indications of a basic meningitis being present. The results obtained by it so far are certainly not encouraging and we do not know what harm may be done by the injury to the brain substance. The danger of a secondary infection is greater with a ventricular than a lumbar puncture, on account of the tendency of scalp wounds to remain open and the close proximity of the meninges to the surface.

In view of these considerations we feel that the use of ventricular puncture should be restrained rather than encouraged. The serum is usually given each day for the first four days. Further administration depends on the patient's general condition, and the bacteriologic examination of the fluid. It *must* be continued daily until the fluid is sterile, as shown by a negative forty-eight hour culture. If, as occasionally happens, the fluid becomes sterile before the clinical condition is greatly improved, the serum should be continued, but not necessarily every day. Puncture for the relief of pressure may have to be done several times during convalescence.

In treating cases it must be remembered that frequently the stiff neck is the last symptom to disappear and if the fluid has cleared up and the temperature stays down it may be entirely disregarded.

Usually from four to six injections are necessary, but sixteen or more are sometimes needed; twenty-eight is at present our maximum number.

If a case shows a tendency to become chronic an autogenous vaccine is made. Sometimes it has seemed to be very effective, but we have not had enough cases to be able to draw definite conclusions,

yet we have never seen it do any harm. To be of benefit it seems necessary to use large enough doses to get some reaction. These may require as much as eight billion.

In planning the general treatment it is necessary to remember that epidemic cerebrospinal meningitis may be a greatly prolonged febrile disease. The patient is best kept in a quiet, darkened room. Sedatives are needed if the patient is very restless. The patient must have rest. If small doses of bromide or chloral do not hold the patient, it is best to give opium or some derivative rather than to risk depressing the heart by larger doses of bromide.

The bowels and bladder should receive careful attention, particularly the bladder, retention and cystitis being not uncommon. Patients should not lie in a draught and should be carefully covered up, especially during and after puncture. We have learned by bitter experience how easily they fall victims to pneumonia. In ordering the hygiene of the sick room it must be remembered that the meningococci are found in the secretions of the nose and throat and rarely in the urine. The diet should be such that it may be easily digested, but generous in amount as soon as the vomiting ceases. The high caloric diet of typhoid is indicated for the reason that meningitis, like typhoid, may be prolonged. Small quantities of food must be given frequently. The ice bag gives some relief for the headache.

Cerebrospinal meningitis is so serious a disease that no point that may aid in the recovery can be safely omitted. Especially do the restlessness and the feeding require careful attention. Results of treatment show for the last one hundred cases a mortality of only twenty per cent.

Pyrogenic Therapy.—A. G. Auld (*British Medical Journal*, February 16, 1918) obtained little or no results from subcutaneous injections of various colloidal metals in cases of pneumococcal, streptococcal, and other infections, but the intravenous injection of such metallic preparations were somewhat more promising, especially when they were followed by some elevation of the patient's temperature. A sample of colloidal platinum was used which gave a very marked reaction after intravenous injection, including rigor, high temperature, sweating, nausea and vomiting, and headache. The use of this preparation was followed by strikingly good therapeutic effects. A fresh, protected sample of colloidal silver produced similar reactions and equally good results, and on trying the effects of the protective alone the same responses were obtained, including the therapeutic effects. This protective was a four tenths per cent. solution of veal peptone with one per cent. of glucose. It was evident that the pyrogenic substance and the therapeutic agent was not the colloidal metal, but the peptone. The reaction was precisely similar to that produced by the intravenous injection of killed typhoid vaccine, proteoses, nucleic acid, etc., and it would seem that the colloidal metal played little, if any, part in the production of the results, since the injection of colloidal metal preparations which did not cause the pyrogenic shock also failed to manifest any therapeutic actions.

THE RELATION OF CARBOHYDRATES TO PROTEIN SYNTHESIS.

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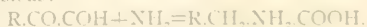
(Concluded from page 828.)

DATA FROM CARBOHYDRATE METABOLISM.

With regard to the chemical reactions involved in the possible formation of protein from glucose, Cathcart (4) has cited various syntheses of carbohydrates and their derivatives with ammonia compounds. Most of this data has been obtained *in vitro* and is therefore but guardedly applicable to the present question. Hence these experiments need not be referred to in detail here, except to emphasize that sugars and more simple aldehyde compounds are known to form readily various combinations with nitrogenous substances, even urea. Some of these substances are metabolically important. Protein synthesis from carbohydrates and ammonia compounds has been unquestionably demonstrated to take place in plants (29). In this regard it is of interest to note that the formation of protein from ammonium sulphate and glucose can be accomplished by yeast, and it is even proposed to utilize this synthesis for food purposes in Germany during the present war (30).

Cathcart in the absence of positive evidence surmised that it was the union of keto and aldehyde groups of such substances as methyl-glyoxal, $\text{CH}_3\text{CO}\cdot\text{COH}$, with nitrogen which bring about protein synthesis. More recently Dakin and Dudley (31) in a series of articles have contributed very important new data which is now applied to the subject under consideration. These investigators discovered glyoxalase, a ferment capable of converting α -ketonic aldehydes into α -oxy-acids. This made the presence of α -ketonic aldehydes within the body a practical certainty. Lactic acid formation from methyl-glyoxal was also demonstrated by Neuberg (32) who has also found that a considerable variety of sugars, including lactose and glucosamine, yield methyl-glyoxal (33).

Important data supporting the theory of amino acid synthesis from nonnitrogenous material was also brought by Dakin and Dudley, who obtained actual evidence of the synthesis within the organism of glycine, leucine, α -aminophenylactic acid and possibly of phenylalanine from glyoxal, isobutylglyoxal, phenylglyoxal, and benzylglyoxal respectively. These authors further conclude that the direct formation of aminoacids from glyoxals and ammonia according to the following simple reaction is dubious:

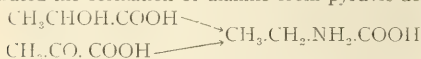


It is more probable that the synthesis of aminoacids from the keto-aldehydes proceeds then via the α -ketonic acids.

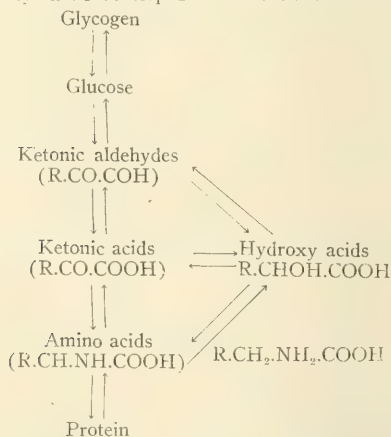


Further evidence that this view is correct had been previously furnished by Knoop, Embden, and coworkers (34), who demonstrated the formation

of aminoacids from corresponding α -ketonic acids *in vivo* and recognized the importance of this observation. Embden and his coworkers (35) have, however, contributed another fact of fundamental significance in the study of protein synthesis. They were able to satisfactorily demonstrate the abundant formation of alanine in the perfused glycogen rich liver on the addition of ammonium chloride. In livers poor in glycogen but little alanine was formed. Proof was thus afforded of the synthesis of an aminoacid in an organ from carbohydrate and ammonia under conditions closely resembling the normal. The synthesis of alanine from lactic acid has long been known to occur under similar conditions. Embden and Schmity have also demonstrated the formation of alanine from pyruvic acid.



It will be remembered that protein sparing experiments previously referred to have demonstrated that glucose, lactic acid and pyruvic acid all have the ability to prevent protoplasmic loss and that this action at least in the case of glucose cannot be adequately accounted for on dynamic grounds alone. The aminoacid synthesis just described as taking place from these substances may then be held to account for their sparing action on nitrogenous metabolism. These two series of results may be regarded as mutually corroborative and represent important evidence supporting the theory of protein synthesis developed in this article.

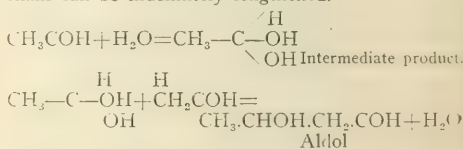


The above schema illustrates the intermediate steps in the formation of protein from carbohydrates as a series of reversible reactions. It was demonstrated by Dakin and Dudley that glucose very readily formed methylglyoxal under conditions similar to those *in vivo*. Metabolism of ingested proteins can lead to glycogen formation (36). Glucose formation from protein in the diabetic animal has been shown by the writer to depend on glucose formation from the aminoacid radicals contained in protein (9). Hydroxy acids, ketonic acids, and aminoacids are known to form glucose in diabetic animals (37). All these observations make it probable that the course of protein anabolism and

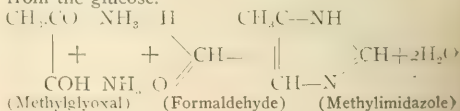
catabolism, normal or otherwise, includes the intermediary formation of the aldehyde bodies of the type just described. It is likely that the synthetic reactions taking place in the building up of protein may by later investigation be definitely shown to be the reverse of those representing the breakdown of protein.

With the formation of the corresponding amino acids from α -ketonic aldehydes the synthetic possibilities of glucose products within the organism are by no means exhausted. Formic acid was shown by Dakin, Janney, and Wakeman (38) to be a product of glucose and protein metabolism and may arise, as indicated by the conversion of methyl alcohol into formic acid, in the organism from compounds derived from glucose containing but two carbon atoms. Formaldehyde also yields formic acid in metabolism (Pohl). The ready power of combination of lower as well as higher aldehydes to form longer carbon chains is well known. Glucose itself has been shown to be synthesized from formaldehyde in the animal body (39). The vast importance of this synthesis in plant metabolism is well known. From Ringer's experiments acetaldehyde and propylaldehyde seem capable of synthetic utilization in the body. It is likely that these aldehydes or related metabolic products contribute to the upbuilding of longer carbon chains from shorter, with protein and possibly fat as end products.

Existing knowledge of the course of the reactions entered into by aldehydes within the organism is at present so slight that for possible syntheses involving aldehydes we have mostly only analogies from *in vitro* experiments to draw from. It is here merely suggested therefore that such reactions may occur with the help of the aldol aldehyde synthesis, which only requires the addition of water to two molecules of aldehyde. In like manner the carbon chain can be indefinitely lengthened.



Substances derivable from carbohydrate are also known to enter into the synthesis of aromatic nuclei, which represent component radicals of tissue proteins. Thus Minkowski's (40) well known experiments demonstrated that uric acid can be synthesized from ammonium lactate. Kowalewski's and Salaskin's (41) liver perfusions corroborated these results. The nitrogen of urea under such circumstances has been shown to be convertible into uric acid. Windaus and Knoop (42) have observed ready formation of methylimidazole from glucose in the presence of weak alkali and ammonia. This reaction can be accounted for by the production of formaldehyde and methylglyoxal from the glucose.



A synthetic relationship of glucose to histidine and the purin bases was indicated by this work, for in these substances the arrangement of the carbon and nitrogen atoms as well as the double linkages are the same as those of methylimidazole. A relationship between the pyrrolidine nucleus and glucose has also been established by Dakin's (43) observation of the formation of this sugar from proline.

At this point a few remarks concerning glycolysis may be added. Based on the observation that the disappearance of carbohydrate in tissue is usually accompanied by carbon dioxide formation, it has been generally believed that such glycolysis is mainly an oxydative process. There are, however, various objections to be offered to this view, which cannot be discussed in detail. The reader is referred to Rosenberg's (44) monograph on the subject, which emphasizes the fact that the reactions of glycolysis are not to be regarded as purely oxydative in nature. Levene and Meyer (45) have also recently found that carbon dioxide formation in such experiments is in reality to be ascribed to bacterial activity. Based on their observation of the probable formation of disaccharides from glucose in tissue they hold such synthetic reactions may account for the disappearance of glucose. As, however, in other experiments by these workers lactic acid was found to be a product of glycolysis under similar conditions, the possibility must be considered that the utilization of sugar in this case may consist at least in part of its splitting into intermediate substances which become incorporated into aminoacids by synthesis and thus escape detection. The fact that the formation of considerable amounts of disaccharides has not been reported anywhere in the body, makes it also unlikely that the interesting synthetic reaction discovered by Levene and Meyer plays an important role in normal metabolism. It is possible the disaccharide formation is to be rather regarded as somewhat similar to glycogen formation from glucose for storage purposes. On these grounds it is believed that the findings of these authors by no means represent strong evidence against the view of carbohydrate metabolism supported in this article. Recapitulating then, evidence exists of the disappearance of considerable amounts of glucose in the tissues without any distinct proof of its complete oxidation or conversion into store products. Such utilization of glucose may then in the absence of definite evidence to the contrary be as well regarded as a synthetic one taking place in the manner suggested on previous pages.

This discussion of intermediary metabolism may be closed with a general consideration of aminoacid metabolism from the synthetic viewpoint here adopted. The fate of the aminoacid radicals of the food proteins is now better understood in view of modern work. Whereas it was once held that these acids after absorption chiefly underwent direct incorporation into circulating or tissue protein by re-synthesis, it seems at present doubtful if this represents their chief route of metabolism. Ingested aminoacids are known to undergo deamination so completely that ninety per cent. or more of their

nitrogen may be eliminated as urea and ammonia in the urine in a few hours' time (Levene and Meyer, 24). Even though these acids are readily absorbed from the blood they remain at least for some time unchanged in the tissues. On the other hand it seems, though not definitely demonstrated for living protoplasm, sternly necessary to accept that the final step of protein formation consists of a linking together of aminoacid radicals. The best explanation for these observations may then be that the introduction into the organism of large quantities of aminoacids in the food cannot be always followed by the direct synthetic utilization of these units which might be but ill assorted for meeting the specific repair requirements of the various body proteins at the time of ingestion. Accordingly deamination and catabolism take place also aside from dynamic necessities.

It seems, however, unlikely that so much of this valuable pabulum should be entirely lost to the body under normal conditions. It is more reasonable to accept on economical grounds that at least a portion of these aminobodies is broken down under these circumstances only sufficiently far to permit of their proper synthetic recombination into new aminoacids or other more complex substances, which are actually required for repair purposes. It seems also probable from the above discussion of intermediary reaction that the union of such newly formed non-nitrogenous intermediary products with other substances including those of nitrogenous nature represent at least a part of such synthetic processes. Indeed it may be that deamination and formation of simple nonnitrogenous intermediary products from ingested aminoacids may take place largely to provide synthetic material of a simple and common type which is used in the formation of protein or even carbohydrate or fat according to the special requirements of the organism.

We may then recognize several sources of supply of the aminoacids taking part in protein formation. First they may be obtained as digestive products of food proteins. In event of the supply from this source being inappropriate or inadequate for the varying repair or growth requisites, synthesis of these acids is likely carried out from simpler products in the manner indicated above. In prolonged fasting when both the supply of preformed aminoacids from the food and synthetic material utilizable in their formation is cut off, these indispensable substances or material from which they can be formed are supplied by the catabolism of the animal's own protein. The views here advanced are then in accord with known data as well as the remarkable economy so frequently exhibited by the organism. That there seem, however, limits to the synthetic ability of the organism is also evident from well known observations of Osborne and Mendel, who showed that food mixtures lacking certain aminoacids were unable to maintain equilibrium of weight or growth.

THE MUSCLE METABOLISM

Certain facts known with regard to muscle metabolism seem best accounted for by the view of protein synthesis discussed in this article. In order to

properly approach the consideration it is necessary to emphasize that the chemical changes occurring in muscle are not wholly of dynamic nature. The older view that muscle contraction is due to the combustion of various substances within these organs in a manner analogous to the burning of fuel in a heat engine can no longer be considered adequate. This is shown among other data by recent work (46) which demonstrated that absorption of oxygen and liberation of heat continue for a considerable time after contraction has ceased. Definite evidence is difficult to obtain, but it is very probable that the loss of substance owing to increase in catabolism during work is probably balanced normally by corresponding synthetic repair processes.

Observations of the gaseous metabolism may now be correlated with this viewpoint. It must however be remarked that in judging of the value of results of such experiments, a critical knowledge of the technic employed is essential. The results of many experiments are therefore of doubtful value. But this much at least seems clear. By some observers the respiratory quotient has been found to be increased by work and by other equally reliable investigators, decreased. More recent studies have however shown that when a sufficient supply of oxygen is present the respiratory quotient fails to rise. In abnormal conditions, *i. e.*, overexertion, lack of proper blood supply, absence of sufficient nutriment and oxygen, the respiratory quotient does become increased as a result of muscle work. According to Katzenstein (47) these phenomena are due to two kinds of chemical processes which go on in muscle, a regenerative accompanied by absorption of oxygen, and a degenerative characterized by breaking down of already formed material and a consequent setting free of carbon dioxide. The latter occurs when muscle work takes place under the adverse conditions referred to. It is accepted that carbohydrates play a very important rôle in muscle metabolism. There is abundant evidence that during a period of contraction an extensively increased utilization of carbohydrate by muscular tissue takes place. The limit of tolerance for ingested glucose is elevated during work (48). Exhaustive muscular labor results in a decrease in the amount of blood glucose (49). An increased amount of glycogen is made use of by contracting muscle.

It is, however, doubtful whether dynamic grounds are sufficient to account for the disappearance of carbohydrate in muscle. The addition of glucose to the nutritive fluid in respiratory experiments on the heart and other isolated muscle preparations have, it is true, usually shown a rise in the respiratory quotient, but this may be due to a combustion of glucose added in excess. Such experiments are not directly comparable to the experiments showing a failure of the respiratory ratio to rise under normal conditions. The weight of modern evidence seems to be in favor of an extensive utilization of carbohydrate by muscle without rise of the respiratory quotient providing unusual and disturbing factors are excluded.

In attempting to account for these observations,

the following may be said. It is known that carbohydrates are not stored in contracting muscle, which on the contrary is rapidly depleted of its glycogen. Conversion into fat can be excluded. Combustion of the carbohydrate is not indicated by the low respiratory quotient observed under normal conditions. It seems then justifiable to surmise that the increased utilization of carbohydrate under these circumstances is at least in part a synthetic one. There is moreover also ground to believe that nitrogen arising from degenerative changes in muscle due to work may be resynthesized in that organ. The inference may then be made that carbohydrate metabolites and nitrogen may be synthetically utilized in muscle in protein repair and regeneration.

GENERAL CONSIDERATION.

The enormous extent of protein formation taking place in a living organism is evident when one considers that practically all varieties of cell and protoplasm are being constantly multiplied or replaced. This is especially evident in growing individuals, but protein synthesis, even on an extensive basis, by no means ceases on arrival at adult age. The increase of organ substance such as muscle after a period of athletic training and the new tissue formed in the closure of wounds, growth of the embryo, uterus, and breasts in pregnancy and lactation are very apparent examples of this process. Degeneration of protein may likewise take place in considerable degree. Examples of this on a large scale are atrophy of the muscles due to disuse and involution of the uterus after parturition. It is very probable that protein degeneration and regeneration go on simultaneously, even daily and hourly in the same organ and possibly within the same cell. We know that protoplasm in a state of function loses part of its own substance when insufficient nutriment is at hand. The disappearance of food material in organs often cannot be adequately accounted for on dynamic grounds alone. It seems then reasonable in view of modern knowledge to accept the theory of metabolism brought out originally by Justus von Liebig, that a continual breakdown and upbuild of living substances is constantly taking place.

With the adoption of this view the necessity for very extensive and active synthetic capability on the part of the organism must be recognized. This standpoint has indeed been substantiated by the studies of recent years which have made it evident that the anabolic processes involved in tissue formation begin with the union of less complex substances than was formerly supposed. The recent observation of Osborne and Mendel (50) that animals can be nurtured over long periods of time on a diet consisting as to nitrogenous substances of but a single isolated protein and can even bear young on this diet is here of fundamental importance. It presents proof that the various complex constituents of the protein molecule, even nucleoproteins, can be built up of the nitrogen, and at least in part, probably also of the carbon hydrogen and oxygen contained in the ingested protein consisting solely of aminoacids. In view of the present knowledge very extensive cleavage must first occur, then as extensive syntheses of the simpler radicals so set free.

In previous pages evidence has been advanced that such synthesis of protein may be brought about by the union of simply combined nitrogen with likewise simply constituted nonnitrogenous substances which latter are at once products of carbohydrate and protein metabolism.

A comparison of plant and animal metabolism is of considerable interest in this connection. It is well known that the vegetable organism is able to build up its protein from water, carbon dioxide, and the inorganic nitrogen of the soil. Indeed differences in the nutritional processes of plants and animals seem mainly referable to necessary secondary changes of alimentary nature due to departure from a sessile habitus on the part of the latter. Reasoning then in a broad biologic way there does not seem after all any very good ground for believing that the free synthesis of protein from the simplest inorganic carbon, hydrogen, and nitrogen compounds should become so completely extinguished in animals as is generally accepted at present. Certainly the chemical composition of animal proteins presents no peculiarities as compared to plant protein. Why then should the chemical processes involved in synthesis of protein in plants become entirely lost to animals, especially as such formation of new tissue from simple substances is one of the earliest and most fundamental phenomena exhibited by cell life?

There are moreover other instances where the most extensive synthetic ability is retained by animals. Sugar arises in the plant organism by synthesis of carbon dioxide with water with the probable intermediary formation of formaldehyde. In the animal organism glycogen as already mentioned is known to have been formed in the liver from formaldehyde. In view of all these considerations it is believed that the theory of protoplasmic formation supported in these pages stands likewise in accord with known biological phenomena. It is then evident that a much more intimate relationship may possibly exist between carbohydrate and protein metabolism than has been generally believed hitherto. As carbohydrates yield metabolites which seem required for the repair and regeneration of protein it is evident that a disturbance of protein metabolism may follow an impairment in carbohydrate metabolism. Conversely primary disturbances in the synthetic formation of protein may lead to anomalies in carbohydrate metabolism. It seems even possible that present day conceptions of various disorders of metabolism may in the future require modification in accordance with these views. There are indeed indications that the cause of various trophic manifestations in such anomalies of metabolism may be due to faulty protoplasmic nutrition of this nature which in turn are at least partly referable to an insufficiency in the supply of repair material, as in diabetes, or to inability to carry out the synthetic processes required, as in failure of the function of the ductless glands. In the present communication it is deemed desirable merely to call attention to these possibilities.

Diabetes mellitus presents an intricate metabolic picture in which the failure of carbohydrate to break down stands out in sharpest profile. But neither the impairment of carbohydrate combustion nor the

presence of increased amounts of carbohydrate in the tissues can adequately account for the many signs and symptoms of disturbed protoplasmic nutrition present in this disease. Such manifestations are increased nitrogen output aside from that due to dynamic causes, degenerations in the muscles and other organs, failure of traumatized tissues to undergo prompt and complete regeneration, tendency of new formed tissue to breakdown, susceptibility to gangrene and bacterial invasion. For these lesions no theory of diabetes as yet advanced has afforded an adequate explanation. In view of the data presented in this article it seems, however, possible that these manifestations of disordered protoplasmic nutrition may be consequent to a failure of the supply of substances required in the constructive processes due in turn to the failure in this disease of carbohydrates to undergo normal dissociation. The acidosis of diabetes may be likewise accounted for by a synthetic hypothesis which will not be developed here. Certainly a reasonable explanation of many apparently unrelated symptoms of diabetes can thus be advanced.

The ductless glands are known to exert a profound influence on carbohydrate and protein metabolism. These organs also exert a controlling function in growth and development, processes involving free synthesis of protein. It seems then possible from the evidence collected in this article that the synthetic function of these organs may be connected with the influence exerted by them upon carbohydrate metabolism.

More light would be thrown on the metabolism and pathogenesis of thyroid diseases. The thyroid is known to influence carbohydrate metabolism. Disturbance in the carbohydrate utilization exists in Graves's disease and hypothyroidism. The increasing breakdown of body tissue in Graves's disease might be partly due to a toxic effect and partly to the effect of the dysfunctioning thyroid on carbohydrate metabolism.

The disturbance of protein metabolism in cretinism might also be connected with failure in synthetic utilization of carbohydrate. It is also known that profound disturbances of carbohydrate metabolism are present in other diseases of the endocrine glands, as in Addison's disease, dyspituitarism, and muscular dystrophy (51). It seems not unlikely that the metabolic changes in these cases might also be explained from the same synthetic viewpoint which has been developed in this article.

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TUMOR OF THE CEREBELLOPONTINE ANGLE*

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Certain brain tumors have a characteristic symptomatology which offers a certain degree of definiteness in diagnosis. Among these are tumors of the cerebellopontine angle. Neurologists and otologists have contributed equally toward accuracy of localization. Such a case recently came under my observation. The clinical diagnosis was confirmed by operation. The history of the case is as follows:

CASE.—Samuel S., aged forty years; native of Austria; window cleaner; married; was admitted to Har Moriah hospital, July 11, 1916. Family history was negative. He had had a chancre infection sixteen years previously which was treated locally and cured; no secondaries.

He had taken alcohol in excess between ages of sixteen and thirty years; he smoked moderately and was irregular in habits. His present illness began one year ago with noises in his right ear which did not interfere with sleep or occupation. He complained later of vertigo. Three months ago thickness of speech became evident. Eight weeks ago vision in his right eye became impaired; there was also some pain in the right eyeball. For the last six weeks there was intense headache, especially over the right side, which was continuous and dull and occasionally neuralgic in form, especially when he woke up from sleep. He had the sensation of air blowing around the right side of his face. During the last four or five weeks, he experienced severe vertigo, which came on at various times of the day and night. His gait became impaired. If he walked slowly, he tended to fall to the right side, but he overcame this tendency partly by rapid locomotion. During the last two weeks he found that drinking rapidly caused coughing and some regurgitation through the nose. He began to vomit within the last few days. He had some salivary drooling and great difficulty in swallowing solids. He felt that his right upper extremity was unsteady. He had no cough; appetite was poor; bowels were constipated, and there were no urinary symptoms.

Physical examination showed a fairly well nourished individual. The head was tilted slightly backward and directed to right. There was distinct percussion tenderness of the skull on right, especially posteriorly. The Macewen sign was suggestive. Some rigidity of the neck was present. Cranial nerves: Olfactory was normal. Optic—double choked disc, more marked on the right. Ocular nerves—pupils were round and equal and reacted to light and accommodation. There was nystagmus, the slow movements being directed to the right, the rapid oscillations to the left. There was some weakness of the external rectus on right. There was anesthesia of the whole right side of the face including the mucous membrane of the nose and mouth. Taste sense was impaired in the anterior part of the right side of the tongue. There was areflexia of the cornea and conjunctiva on right; the motor fifth was distinctly paretic on the right; when the patient opened his mouth, the jaw dropped toward right. Weakness of all three branches of the facial on the right was manifested

with widening of the palpebral fissure. Watch tick and tuning fork, C 128, were not heard on the right either through air or bone conduction. In Weber test, he lateralized to the left. Dr. E. Danziger reported as follows: "Transverse horizontal nystagmus to both sides. Complete deafness in the right ear was shown by the Bárány noise apparatus; there was spontaneous nystagmus to the right and injection of water did not neutralize this nystagmus. Caloric tests on the right were negative and slightly impaired on the left. There was neither cochlear nor vestibular function on the right. In the pointing test he pointed to the opposite side." Our own pointing tests were inconclusive. The uvula deviated slightly to the left; throat reflex on the right was lost. There was no aphonia. Dr. M. Lubman found no disturbance in the movements of the vocal cords. There was some weakness of the sternomastoid and trapezius on the right. The tongue deviated to the right; no atrophy or fibrillary twitchings were noted. Motor power was found impaired in both the right upper and lower extremities. Sensation was normal. There was distinct ataxia in the right upper and lower extremities. There was adiadokokinesis on the right. Deep reflexes were increased in the right upper and lower extremities. No true ankle clonus was present. There was no Oppenheim, Babinski, Mendel, or Rossolimo on left. Rossolimo on the right was present. Abdominal wall reflexes were absent on the right and diminished on the left. Cremasteric reflex was absent on the right, and foot sole reflex also was not present. Patient was unable to stand on his right leg and fell to the right. Spontaneous pointing on the right was faulty.

There was no bladder and rectum disturbance. Pulse was 54 to 68; temperature, 98.6° to 99.2° F.; respiration, 20. Lungs, heart, and abdomen were negative. Blood pressure: systolic, 100 to 108; diastolic, 72 to 74. Urinalysis was negative. Blood Wassermann reaction was negative on admission and after a provocative test of mild antispecific treatment. White blood count: Total, 9,400; polymorphonuclear neutrophils, 78; lymphocytes, 22; hemoglobin, seventy-five per cent.; x ray of the skull was negative. Lumbar puncture was not done, due to the evidence of jamming of the brain stem to the opposite side, and due to the fact that the posterior fossa was involved.

The symptoms of brain pressure became progressively more marked and the patient was referred to the surgical division for operation. The clinical diagnosis was tumor of the right cerebellopontine angle. Dr. Leo Buerger operated. Thinning of bone was found. Dura was very tense. It was incised and tumor was found in the space designated. It was excochleated because it could not be removed *in toto*. Section showed fibrosarcoma. The patient died forty-eight hours later from medullary paralysis.

The history, onset with subjective noises, and the findings, central deafness, loss of vestibular function, areflexia of the cornea, homolateral ataxia, adiadokokinesis, nystagmus, and the scant involvement of the brain stem, gave a characteristic clinical picture. The interesting feature is the evidence of the *contrecoup* mechanism described by Oppenheim (1), i. e., lesion of the pyramid of the opposite side giving homolateral pyramidal tract symptoms. The involvement of the left eighth may have been due to the same jamming of the brain stem to the opposite side or to a small neurofibroma on this side as well. Post mortem examination was refused, therefore this could not be definitely established.

Oppenheim (2) reported a case of what was probably an acoustical tumor, but he thought that it was cerebellar in origin. This was in 1890. Monakow (3) made a contribution to this subject in 1899. Sternberg (4) collected a series of cases in 1900. These tumors were carefully described in 1902 by Henneberg and Koch (5), who called them acoustical tumors, due to the frequency with which they localize themselves in the sheath of the eighth nerve. They may, however, take origin from the connective

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tissue of any of the nerves of the posterior fossa from the fifth to the twelfth, from the last, however, only rarely. They lie in the space between the pons and anterior lower part of cerebellum very loosely adherent to adjacent structures. As they grow in size, they may compress and impinge upon the cerebellum and brain stem. They may be bilateral or may give rise to symptoms suggesting bilaterality due to jamming of the brain stem to the opposite side; our case was a case in point. They may be part of a general neurofibromatosis. Pathologically, they may be fibromata, neurofibromata, gliofibromata, neurogliomata, and figrosarcomata. Fraenkel-Hunt (6), Ziehen (7), Weisenburg (8), Starr, and many others have reported cases. The best monograph on the subject is that of F. Henschen (9), and, recently Cushing has published an excellent monograph on the subject.

The first symptom is usually due to an irritative lesion of the chochlearis. Later central deafness comes on. The lesion of the vestibularis manifests itself in vertigo, Menier-like phenomena, and disturbances of equilibrium. There may be abnormal position of the head due to disturbed orientation in space. There may be head tremor. There usually is simultaneous involvement of the facial although the seventh may be spared at times. Mingazzini (10). The facial paralysis is of the lower motor neuron type. The sensory trigeminus is very frequently involved and Oppenheim calls attention to the importance of areflexia of the cornea and conjunctiva in these cases; according to Oppenheim this may be the first symptom. Sometimes this symptom will be found only when the patient lies on his side. There are usually paraesthesias of the face, neuralgic pains; Weisenburg's case had a fifth nerve neuralgia for some time. The motor fifth is also frequently involved. The abducens, too, is frequently paretic and at times there may be paralysis of the associated movements of eyes toward the side of the tumor. If this occurs, it means an intrapontine lesion in addition—hemorrhage into nuclei.

Nystagmus is always present. V. Bruns (11) and Stewart found the slow movements directed toward the side of the lesion. Our case showed the same finding. When this is present in spite of the loss of irritability of the labyrinth, it means lesion of Deiter's nucleus, i. e., pressure on brain stem Marburg, Jones (12). Lesion of the ninth is shown by disturbed innervation of palate, so that the uvula deviates toward one side on voluntary innervation or the pillar on one side hangs lower than on the other. There may be regurgitation through the nose, during swallowing of fluids and loss of gagging reflex on one side. The involvement of the vagus is shown by tachycardia, "labile" pulse (Marburg) and disturbed innervation of the vocal cords. The trapezius and sternomastoid may be found parietic. The twelfth is rarely involved.

Involvement of cerebellum is shown by homolateral adiadiokokinesis and cerebellar ataxia or asynergia. The gait is frequently cerebellar, the patient tending to fall toward the side of the lesion. The ataxia seems more marked in the upper extremity and is usually not severe. Spontaneous past pointing has

been described (Marburg), our own case showed this sign, but the tests gave no conclusive results.

Oppenheim and von Bruns report brain stem injury. Marburg considers this infrequent and not marked. Where the pressure is great, the nerves of the opposite side may show signs of involvement; our own case shows this *contrecoup* mechanism. Oppenheim mentions the occurrence of tremor in the upper extremity. The changes in the fundus come late and are more marked on the side of the tumor. Pressure on the chiasm by the associated hydrocephalus may lead to hemianopsia.

The triad of lesion of the eighth nerve, of the sensory fifth and nystagmus is very characteristic. These tumors must be differentiated from tumors of the lower margin of the cerebellum and from intrapontine neoplasms. In the latter the choking of the disc is much less common, the cranial nerve lesions, more definitely bilateral, and there usually are typical pontine symptoms, sensory changes, etc. Schüller has described thinning and bending anteriorly of the posterior limb of the sella turcica, and Marburg confirmed this finding. Henschen has described dilatation of the internal auditory meatus by the tumor mass.

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IMMUNIZATION AGAINST COLDS.*

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New York.

Though this is a timely subject and one of great importance, it is one which presents great difficulties in reaching a fair estimate of how much good is accomplished by immunization. I note first the fundamental factors which present themselves as important.

"Colds" are probably due to many causes other than bacterial. These may be local or general. It is likely that the most potent general cause is intestinal poisoning of a chronic nature, leading to an alteration of the vasomotor control, with a probable further addition of a local cause to keep this condition active. With such a patient—usually anemic, under par, etc.—the least local interference with vasomotor supply in other parts of the body—such as chilling of the surface of the body—would almost immediately be followed by an acute chill. The local causes predisposing to a cold are very important and can be divided into two classes: the first consisting of malformations of the nose, such as a deviated septum, mechanical presence of adenoids, etc.; the other, probably the most important, includes chronic disease of the frontal

sinuses, very often of such a low grade that their presence is not suspected. These conditions, to me, form the most potent cause of all, and we have been receiving confirmation of this within the last few months. Then there is the "cold" which is simply a manifestation of a general condition, such as grippé. The common, ordinary cold in the head, viewed locally, may be due to the irritation of a foreign substance, such as dust, etc., but is most often due to infection with certain bacteria, and it is with the latter we have to deal.

The bacteria usually found in the nose run in certain groups; in our own experience we find them usually in the normal nose strains of *bacillus mucosus capsulatus*, *pneumococcus* No. 4—pathogenic for white mice—*micrococcus catarrhalis*, and the various strains of cocci—such as the *streptococcus hemolyticus* and the *staphylococcus aureus* and *albus*. Very often two or more of these are found, or one in pure culture. This is in the normal nose. What significance have such organisms? Are they present simply as saprophytes or capable of producing disease under favorable circumstances—these being provided by the already mentioned intestinal conditions, etc.?

Now, during the cold, one who has done this work is struck at once by the fact that many of the cultures from the secretion are negative, even if taken on the richest media. The explanation may be that on account of the high acidity of the secretion the bacteria are killed off except at the very points of infection which may be so high up in the sinuses that it is impossible to get a culture; or it may be that the lesion is caused by a filterable virus which cannot be demonstrated with our present devices. This thought is worthy of notice, as several other conditions have been found to be due to such a virus. Added evidence comes from Tuncliffe, who was able to inoculate herself with such a virus and produce a typical acute coryza. Hence, there is some difficulty in determining the bacterial cause.

One other point is that the influenza bacillus sometimes found in colds is a very difficult organism to isolate compared with the other organisms, and if proper media is not used failure to isolate it will result, and its presence may not be suspected.

Now, as to the propriety of immunization against such a condition? Judging from practical results there is no question but that in patients properly selected, with the above conditions in mind, immunization of greater or less degree has been secured and that in some cases it has lasted as long as two years and will probably last longer. The big question is to know which vaccine to use—whether autogenous or stock—and this is a question that I cannot answer in any way except to give our routine.

We investigate the patient's nasal flora and make up the vaccine of the organisms found there, adding some freshly isolated strains of the more common organisms. The results obtained by this method seem to be better than those by the straight autogenous or stock. There seems to be some scientific basis for this procedure, as in paralleling the work of Friedberger and others in the production of anaphylatoxin or proteotoxin and the immunization with this, we found that if we immunized a guinea-

pig against *staphylococcus proteotoxin* it was protected to a certain extent against typhoid proteotoxin, and vice versa. This would be in line with Vaughan's theory about the basal and split proteins, and probably explain the immunization with non-specific vaccines.

The vaccines may be given as a prophylactic or as a therapeutic measure to those suffering with an infection. The ideal, of course, would be to use them as a prophylactic, and this is the method we have usually chosen. The results have been best in this class of cases, some patients retaining their immunity for two years and now entering upon their third year and still being immune. The results with those who are given the vaccine when suffering with a cold or developing one are very poor.

The method of taking the culture is important. It is best to take cultures from the nasopharynx, if possible, and especially so if an adenoid be present. If any sinus disease is present, we take cultures from there, isolate the organisms, and make the vaccine. Repeatedly in such cases we have isolated the various strains of *pneumococcus* and proved them virulent for white mice.

With regard to dosage and periods between the doses: the immunization should be carried out over quite a long period of time, as immunization in other fields is not a thing that can be forced to take place quickly—hence we give about fifteen to twenty doses at intervals of five to seven days. We have personally treated about forty patients by this method and are favorably impressed by the results in general, but are not prepared to go on record as to how much value to place upon this. The main thing we have learned is to pick out the type of case in which to use it, and this has resulted in our being able to diagnose nasal conditions hitherto unsuspected.

One word about "epidemic colds." No doubt this form is easily conveyed from one person to another, and under the conditions under which most of us travel the danger of contagion is very great. It is doubtful if we have isolated the cause in such cases.

In conclusion: immunization is feasible and a beneficial way in which to ward off colds, provided we investigate the patient thoroughly to exclude any local or general cause for such conditions as would be favorable for the development of repeated colds, and so do not ascribe the failure of a vaccine to our own failure in appreciating underlying causal factors.

Dakin's Solution in the Peritoneal Cavity.—

F. C. Mann and W. G. Crumley (*Journal A. M. A.*, March 23, 1918) studied the effects of the injection of Dakin's solution into the peritoneal and pleural cavities of healthy dogs. In the peritoneal cavity even very small amounts of the solution were very painful, caused a fall in the blood pressure, produced a marked serous exudate, eroded and perforated the omentum and mesentery, and larger amounts were fatal. In the pleural cavity none of these effects was manifest and the injection seemed to be without harm. Intravenously even fairly large amounts of the solution caused nothing more than what appeared to be a slight prolongation of the coagulation time.

Abstracts and Reviews.

IS THE PINEAL BODY A GLAND OR A VESTIGE?*

By FREDERICK TILNEY, M. D.,

New York,

Professor of Neurology, Columbia University.

Professor Tilney opened his address with an explanation of the reasons why the study of the problem of the pineal body was taken up. There had been many researches conducted on the subject, and a tremendous amount of literature exists, going back to the earliest times in medicine. Its reputation was extended by the metaphysicians, and further increased by the satirical literature concerning it. Descartes considered it the seat of the soul, but this hypothesis was assailed by Voltaire, who whimsically made it the subject of parody, giving his conception of the epiphysis as a bit of gray matter acting as driver and controlling the action of the cerebral hemispheres by means of two nerve bands. These bands were long referred to by anatomists as "the reins of the soul." Majendie called attention to the fact that there could be no doubt that the function of the pineal body, owing to its position as well as from its structure and form, was to serve as a tampon, designed to expand, and thus close off the aqueduct of Sylvius, and at other times to shrink, and thus permit the expansion of this aqueduct so that the fluid in the ventricles might have free access from the third chamber to the fourth.

For the last fifty years the pineal body has been considered a vestige, the rudiments of an eye which is to be found in some of the lower vertebrates. It was because of this attitude that it was decided to take up the study of this portion of the body in a comprehensive way, and the following methods of approach were adopted: Its morphology, the anatomy and evolutionary significance; its physiological and pathological significance, and its clinical aspects. The results of the study of the morphology would soon appear in a monograph. For the study of the clinical aspects, 150 cases of pineal disease had been gathered and analyzed as closely as possible, with a view to a later contribution.

In order to arrive at a final conclusion concerning so difficult a problem as the one involved in the question, Is the pineal body a gland or a vestige? the subject should be considered in all its aspects, but the present discussion would have to be limited to such evidence as could be deduced from the morphology and evolutionary significance of the pineal body, under the following heads: Its significance in its relation to the epiphysis; reasons against the pineal body being a vestige, and for being an organ necessary to metabolism; histological evidence of function from its structure; question of the relation of the pineal body to the parietal eye, and value of phylogenetic significance of the parietal eye with reference to the vertebrates and invertebrates.

In the beginning of this study, the speaker was

strongly of the opinion that the pineal body was a vestige, but with the facts elicited very different conclusions were formulated. The epiphysis, studied as such, and without reference to the neighboring structures, could not fail to convey a wrong impression concerning its nature and significance to the organism. It was by no means sufficient to study the epiphysis in a few isolated forms; indeed, it was only when this organ was viewed in its entire phyletic relations that its meaning received any illumination whatever. It had been very interesting to note the extent of the massive research which had been devoted to this part of the brain, and from this vast fund of information 190 specimens had been selected for study from species of cyclostomes, selachians, ganoids, teleosts, dipnoi, amphibia, reptilia, birds, and mammals. By far the greater majority of observers in the morphology of this portion of the brain were today of the opinion that the epiphysal complex, as a whole or in some of its parts, exists in all vertebrates.

In the consideration of the morphology of the pineal body, the entire pineal region became significant and the character of every derivative of the roof plate was fundamentally important. That portion of the brain known as the pineal region existed in all vertebrates, either in the embryonic or adult condition, and from a review of the structures associated with the epiphysal complex in the pineal region it was plain that the majority of them gave rise to glandular organs, while those which participated in neural mechanism were not only in the minority, but constituted a relatively small portion of this area of the brain. The inference to be drawn from this was very clear; whatever the functions of the epiphysal complex might be, the morphogenetic impulse imparted to it from a region of the brain so preponderantly glandiferous in its constituents could not fail to have a profound influence on the evolutionary adaptation of the epiphysis.

Nevertheless, it was in the intrinsic characters of the pineal body itself that the solution of its problem lay, and that it could not be a vestigial structure was evidenced by its gross morphology, even if one depended solely upon the fact that it was constant throughout the phylum; for a structure which was marked for regression, or in which evidences of regression could be found, would scarcely show such remarkable phyletic tenacity as it manifested. Its constant occurrence in cyclostomes, in all the fish, in amphibia and reptiles, in birds and mammals, revealed it as a structure which must have been called into being in response to some definite demand. The phyletic constancy of the epiphysal complex, considered in conjunction with the other derivatives of the diencephalic roof plate, was also very significant, for it alone presented this constancy; structures developed in the roof plate of the interbrain ceased to exist when they no longer fulfilled any purpose.

Still further supporting the view that the pineal body is a functional organ were the phyletic variations and morphologic specializations which presented themselves in this organ in the various orders of vertebrates, and which made it difficult to escape the conclusion that this must have occurred in the interest of definite adaptations, for form

*Abstract of an address delivered March 5, 1928, at the regular meeting of the New York Neurological Society at the New York Academy of Medicine.

after form shows a high state of differentiation and definite and discreet specialization, as well as the possession of a pluripotentiality which fundamentally appeared to be in the interest of a differentiation whose functional significance was not sensory. The gross evidence of the progressive specialization of the pineal organ in ophidians, birds and mammals was convincing evidence that the structure was not to be considered a vestige, for otherwise it would not show such definite tendency toward specialization in the processes of evolution.

If the pineal body was a vestige, and of no functional significance, the organ would tend to manifest signs of regression through the periods of growth in man. On the contrary, however, comparison statistics giving the weight of the epiphysis and the hypophysis of man at ages ranging from infancy to seventy years showed that the average weight of the epiphysis through these ages was in the proportion of 1:2, the epiphysis keeping constant pace with the hypophysis, an organ of known endocrinic function, in its weight increment. This increase in the epiphysocerebral complex, from the earliest stages to the latest periods of life in man, was another factor in the conclusion against the possibility of its having been destined to regression.

Another argument against the pineal body being a vestigial organ lay in the fact of its resistance to the encroachment of the corpus callosum. This indicated in it such marked tenacity as a morphologic structure as to suggest the probability of some inherent functional activity. If there were inherent tendencies to retrogression in the pineal body, it must have given evidence of less resistance to the pressure of this newly developed mammalian structure which has so widely altered the configuration of other elements in the diencephalic roof plate, or perhaps have succumbed altogether.

Professor Tilney believed that the morphologic evidence, above summarized, definitely refuted the claim that the pineal body is a rudimentary structure. But he went on to present the histological evidence, which showed the organ to be a glandular structure, and as such necessary to metabolism. In this respect, not only was the character of the cells significant, but their arrangement in definite acini, the rich vascular network about these acini, and the trabeculation by means of connective tissue, which gave this structure the appearance common to all glands, was also suggestive of the fact.

The tendency toward specialization was definitely in the interest of glandular formation in ophidians, chelonians, birds, and mammals. Ontogenetically, in two forms at least, *felis domestica* and man, the development of the pineal body followed the general lines of glandular differentiation. The microscopical appearance of the structure of the organ in birds was particularly striking; here the differentiation was entirely in the interest of glandular formation, the evidence not alone being found in the character of the cells which composed the body, but even more in the arrangement of those cells, whose alveolar patterns constitute irrefutable reasons for regarding the epiphysis as a true gland in birds. In mammals, the character of the chief cellular elements of the pineal body, as well as their arrangement, pointed to but one conclusion, few cells in the

body being more conspicuous for their histological character than the cnet or parenchymatous elements of the mammalian epiphysis. The large and centrally placed nucleus, the extensive and glandular cytoplasm, marked these cells so definitely that they might be easily recognized.

Another conclusion to be drawn from the histological evidence in the epiphyseal complex of vertebrates was the clear indication that this structure possessed a pluripotentiality whose fundamental, inherent tendency was in the interest of glandular differentiation, but in a few instances, as in cyclostomes, amphibia, and in primitive reptiles, the pineal organ could be further differentiated in the interest of a highly specialized sensory mechanism which has, or has had, visual function. As a gland, it may in some cases contribute its secretion to the cerebrospinal fluid, but in the higher vertebrates it is an endocrinic organ contributing the products of its secretion to the bloodstream.

Professor Tilney proceeded to an attack on the theory that the pineal body in mammals is the vestige of the parietal eye in vertebrates. This theory had been accepted by many, but according to the views of the speaker there was, in reality, no direct relation between them. Each was in itself an adaptive modification conforming to differently directed inherent impulses. In other words, the epiphyseal enlargement was pluripotential in its derivatives. The tendency in some few forms to develop visual structures would seem to be a secondary, and not a primordial character. By far the greater majority of vertebrates manifested in the epiphyseal complex, as well as in the region from which it sprang, no tendency whatever toward the development of any neural mechanism. The absence, in the greater majority of vertebrates, of all remnants indicative of visual specialization at least raised a reasonable doubt that the pineal body had at any time possessed visual function. There was universal absence of true ganglionic cells, as well as the lack of nerve fibres going to form a neural mechanism. This, however, might be considered negative evidence. There remained, nevertheless, the scientific fact that the pineal body in all the higher vertebrates manifested a tendency to differentiate along lines which could not be interpreted in the interests of visual function. The differentiation which did occur in the higher reptiles, birds, and mammals gave rise to glandular tissue. From these facts it seemed possible to conclude that the pineal body was not a vestige of the parietal eye.

Concerning the theories of the significance of the parietal eye as an index to the process of evolution from the invertebrates to the vertebrates, the speaker considered them of no value at the present time. The only view admissible was that the median eye of invertebrates was analogous to the parietal eye of vertebrates; this was conceivable, but, even so, there was no evidence that these structures were homologous. In fact, it seemed out of the question to establish any such basis of comparison until this subject of homology in the vertebrate and invertebrate brain was on much firmer ground. Nothing short of the definite establishment of an invertebrate pineal region of the brain could satisfy the requirements of this field of homology.

Medicine and Surgery in the Army and Navy

STATE COMMITTEES ON MEDICAL DEFENSE MEET AT WASHINGTON.

Volunteer Medical Service Corps Organized.—Women Physicians Eligible to Membership.—Senator Owen Explains the Owen-Dyer Bill.—Delegates Dine at Army and Navy Club.

The first annual meeting of the State Committees of the Medical Section of the Council of National Defense was held at the Hotel Willard, Washington, on May 4. The meeting was called to order in the large ballroom at 11 o'clock by Major Franklin Martin, of Chicago, of the Advisory Committee of the National Council of Defense. Dr. Edward Martin, of Philadelphia, was appointed chairman, and Major John P. Maclean acted as secretary. Prior to his admission to the hall each delegate had been required to register and to sign an oath of allegiance and fealty.

The meeting opened with a brief address from Major F. F. Simpson, of the General Medical Board of the Council of National Defense, in which he briefly reviewed the organization of the State committees. He said that this was the beginning of the third year of organization of medical men for national defense, for on April 6, 1916, a meeting had been held for the organization of the medical profession and it was largely due to the work of this preliminary organization that the profession had been made ready for the advent of war.

All stood while the oath of fealty and loyalty was administered by Mrs. E. K. Ellsworth. The chairman then introduced Surgeon General W. C. Gorgas, who said that it afforded him much pleasure to acknowledge with gratitude the debt which the Medical Department owed to the medical profession of the United States as a whole. The Medical Reserve Corps had been organized eight or ten years ago and numbered about 1,300 or 1,400 when war was declared. Its number had now increased to 20,000, and the whole profession had helped to bring about this most excellent condition of affairs. General Gorgas said that gratitude had been aptly defined as a lively appreciation of benefits conferred and a still livelier appreciation of benefits expected. He said that he was in a very grateful frame of mind, not only grateful to the members of the medical profession for having joined in such great numbers, but also for the additional numbers which he hoped would join the Medical Reserve Corps. He still stood in need of 5,000 medical men and time alone could tell how many more would be needed; only that day he had received a cable from General Pershing asking for an additional 500 doctors. This, said the Surgeon General, is what is to be expected in the future. He said that every man who entered the service wanted to be sent to France, that he was overwhelmed with requests for assignments to duty there and the only way that he could get any peace was by confiding confidentially to these applicants the fact that it was necessary to keep a few of the very best men here, and "you (the applicant) happen to be indispensable here, so I cannot afford to send you abroad."

Admiral W. C. Braisted, Surgeon General of the Navy, said that he was frequently spoken of as an optimist, and he was glad to plead guilty to the charge, for he believed that optimism would prove to be an important factor in winning the war. He said that the naval service needed a constant influx of good medical men; it needed 100 a month right along and if the measure now in consideration by Congress for enlargement of the navy went into effect this number would be materially increased. He said that at the close of the first year of the war he was glad to be able to say that the year had been a fairly satisfactory one from the standpoint of the Medical Corps of the United States Navy.

In the unavoidable absence of the Surgeon General of the Public Health Service, Dr. Rupert Blue, the Deputy Surgeon General, Dr. J. C. Perry, spoke briefly of the work of the physicians in that service. Julius Rosenwald, chairman of the committee of supplies of the Advisory Commission of the Council of National Defense, made a brief address, complimenting the physicians upon the record which they had made.

Lieutenant Colonel Caldwell, chief of the division of personnel of the Surgeon General's Office, stated that 23,059 physicians had applied for commissions in the Medical Reserve Corps, and of these 1,598 eventually declined the commissions. One thousand six hundred and fifty-six had been discharged from the service since entering it, leaving 1,255 majors, 4,566 captains, 11,237 lieutenants, a total of 18,775 officers in the Medical Reserve Corps who had received commissions in the Medical Reserve Corps. There were now on the active list 16,532 members of the Medical Reserve Corps. The numbers change, of course, from day to day, so any statement becomes inaccurate almost before it is made. Colonel Caldwell said that there was no idea that such a thing as a draft would be necessary. There were in the United States 150,000 physicians, including women. One out of twelve of these was now in the service. As a matter of fact only about 76,000 physicians are engaged in active practice, and of these one in eight was now in the service of the government. He congratulated the medical profession upon the excellent record which it has made in this connection.

Medical Inspector Murphy of the United States Navy said that the navy needed 1,000 doctors now and would need on an average 100 more every month. Only about fifty doctors now join the naval service monthly, or only half as many as will be needed. Moreover, when the vessels now in course of construction are turned out there will be still additional need for surgeons. On account of the character of the service rendered, the navy has set a lower age limit for entering the service than the army, the age of forty-four being the limit of age beyond which no applicant could be granted admission.

Dr. John B. Maclean, secretary of the State committees, made a report of the activities of the state committees during the past year, showing the enor-

mous amount of work which has been accomplished and the excellent results which have been achieved.

THE VOLUNTEER MEDICAL SERVICE CORPS.

Dr. Edward P. Davis, of Philadelphia, outlined the proposed rules of the Volunteer Medical Service Corps, which had been approved by the general medical board. The rules of the organization are given below.

RULES OF ORGANIZATION.

I. Name.—The name of the organization shall be the Volunteer Medical Service Corps of the United States.

II. Object.—1. The object of the Corps shall be to establish an emergency medical organization to perform, when required, such civic and military duties as are not provided for.

2. Services of members will be called for and rendered in response to requests to a Central Governing Board from the Surgeon General of the Army, the Surgeon General of the Navy, the Surgeon General of the Public Health Service, the General Medical Board of the Council of Na-

State Committees shall select, subject to the approval of the Central Governing Board, five of their members who are eligible for election in this corps to act as the executive committee of the Volunteer Medical Service Corps in the respective States.

2. The duties of the executive committee of the State Governing Board shall be to consider applications for membership in the Corps from the respective States and to submit recommendations regarding these applications to the Central Governing Board.

3. The State Governing Board shall aid in the work of the executive committee and perform such other duties as may hereafter be deemed essential by the Central Governing Board to accomplish the purpose for which the Corps was created.

VII. Membership.—1. Such physicians shall be eligible for membership in this Corps as would be accepted in the Medical Reserve Corps were it not for—

- (a) Physical disability.
- (b) Over age (55).
- (c) Essential public need.
- (d) Essential institutional need.
- (e) Dependents.



Executive committee of the General Medical Board of the Council of National Defense. Seated, Rear Admiral W. C. Braisted, Surgeon General of the United States Navy; Major General William C. Gorgas, Surgeon General of the United States Army; Dr. Rupert Blue, Surgeon General of the United States Public Health Service; Major Standing, Major F. F. Simpson, M. R. C., Chief of the medical section, Council of National Defense; Colonel Victor C. Vaughan, M. R. C., of the University of Michigan, and Lieutenant Colonel William H. Welch, M. R. C., of Baltimore.

tional Defense, or from other duly authorized departments or associations.

III. The Corps.—The Corps shall consist of all members of the organization. The general management of the Corps shall be vested in a Central Governing Board.

IV. Central Governing Board.—The Central Governing Board shall be a committee of the General Medical Board, Council of National Defense.

V. Officers.—The officers of the Corps shall be a president, a vice-president, and a secretary and shall be appointed from among the members of the Central Governing Board. These officers shall constitute the executive committee of the Central Governing Board, and shall direct the activities of the Corps.

VI. State Governing Boards.—1. The State Governing Boards shall consist of the members of the State Committees, Medical Section Council of National Defense. The

2. Women physicians are eligible.

3. Application for membership in the Volunteer Medical Service Corps shall be made upon blanks furnished for that purpose by the Central Governing Board. The completed form shall be returned to the Central Governing Board for proper classification according to training and special fitness.

VIII. Method of Election.—1. The members of the Corps shall be graduates in medicine who are licensed to practice medicine in their respective States, who have made application for membership, who meet the qualification requirements that are now or shall from time to time be established by the Central Governing Board, and who shall be elected to membership by the Central Governing Board.

2. Each physician elected to membership in the Corps shall be designated as a member of the Volunteer Medical Service Corps.

3. It shall be the duty of each member of the Volunteer Medical Service Corps to notify the Central Governing Board when eligibility to the Corps ceases to exist.

IX. Insignia.—1. Members of the Corps shall be authorized and encouraged to wear the insignia of the Corps.

2. The insignia may be secured by members of the Corps under such regulations as may be determined upon by the Central Governing Board.

3. The insignia shall not be loaned to any person not a member of the Corps, nor shall it be worn after notification that eligibility to the Volunteer Medical Service Corps has ceased to exist.

X. Any member of the Corps may be expelled for conduct which, in the opinion of the Central Governing Board, is derogatory to the dignity of the Corps or inconsistent with its purposes.

XI. Authorization.—The organization and insignia have been authorized by the Council of National Defense.

The following constitutes the central governing board which has been created for the organization by the general medical board: Dr. Edward P. Davis, of Philadelphia, president; Dr. Henry H. Sherck, Pasadena, vice-president; Dr. John D. McLean, of Washington, acting secretary; Dr. Edward H. Bradford, of Boston; Dr. Truman W. Brophy of Chicago; Dr. Duncan Eve, Sr., of Nashville; Dr. William Duffield Robinson, of Philadelphia; Dr. George David Stewart, of New York; Dr. Franklin H. Martin, of Chicago, and Dr. F. F. Simpson, of Pittsburgh, ex officio.

The proposal for the establishment of the Volunteer Medical Service Corps and the work which had been done by the various state committees were then discussed by the following delegates, Dr. H. H. Martin, of Savannah, Ga.; Dr. C. H. Schaefer, of Chicago, Ill.; Dr. Harry Sherman, of San Francisco, Cal.; Dr. H. Kahlke, of Chicago, Ill.; Dr. J. A. Witherspoon, of Tennessee, Doctor Slyster, of Wisconsin; Dr. George D. Stewart and Doctor Miller, of New York, and others. Major Franklin H. Martin reviewed briefly the work which has been done by the Medical Department, saying among other things that within a month after Mr. Balfour had arrived and stated that the paramount need of the British army was doctors, we had sent over six base hospitals, and six weeks later ten more base hospitals had gone over. We had also sent 2,200 ambulances and 5,000 ambulance corps men to France, while furnishing many doctors to the British hospitals. In the evacuation hospitals, American doctors and surgeons are working ostensibly on twelve hour shifts, though as a matter of fact most of them work twenty hours a day. He had seen men waiting to be treated in a line half a mile long outside the hospitals, and the surgeons would in some cases tell the orderlies to bring in only serious cases.

At the afternoon session, the proposal for the organization of the volunteer medical service corps was formally adopted by vote. In the general discussion which took place Dr. George Gray, of Kansas City, pointed out the desirability of having medical examiners widely scattered so that applicants for entry into the Medical Reserve Corps would have less travel to perform in order to undergo examination. The time to get a man to apply was when he was interested. If there was a medical examiner conveniently located he would be apt to present himself for examination. If, however, as is the case in some

of the states there was no examiner within a hundred or two hundred miles the applicant was not apt to go to the expense of travelling so far in order to undergo an examination. The general opinion seemed to be that it was desirable to have medical examiners in every good sized town, if this were possible. This discussion was taken part in by Doctor White, of Georgia; Doctor Ellis, of Tennessee; Doctor Dobson, of Mississippi; Doctor Witherspoon, of Tennessee; Doctor Brown, of New York; Dr. George D. Stewart, of New York; Doctor Moore, of Charlotte, N. C., and Doctor Miller, of Philadelphia.

The secretary, Doctor MacLean, then read the statement of the number of physicians recommended for commissions in the Medical Reserve Corps of the Army and Navy up to May 1, 1918 by states. The statement follows:

NUMBER OF PHYSICIANS RECOMMENDED FOR COMMISSION IN THE MEDICAL RESERVE CORPS OF THE ARMY AND NAVY, BY STATES.

State	Army	Navy	Total
Alabama	14	10	24
Arizona	1	1	2
Arkansas	1	1	2
California	1	1	2
Colorado	1	1	2
Connecticut	1	1	2
Delaware	1	1	2
District of Columbia	1	1	2
Florida	1	1	2
Georgia	1	1	2
Idaho	1	1	2
Illinois	1	1	2
Indiana	1	1	2
Iowa	1	1	2
Kansas	1	1	2
Kentucky	1	1	2
Louisiana	1	1	2
Maine	1	1	2
Maryland	2,292	479	2,771
Massachusetts	1	1	2
Michigan	1	1	2
Minnesota	1	1	2
Mississippi	1	1	2
Montana	636	143	779
Nebraska	1	1	2
Nevada	1	1	2
New Hampshire	1	1	2
New Jersey	1	1	2
New Mexico	1	1	2
New York	1	1	2
North Carolina	1	1	2
North Dakota	1	1	2
Oregon	1,187	256	1,443
Rhode Island	1	1	2
South Carolina	1	1	2
South Dakota	676	102	778
Tennessee	3,457	497	3,954
Texas	1	1	2
Vermont	1	1	2
Virginia	1	1	2
Washington	1	1	2
West Virginia	1	1	2
Wisconsin	1	1	2
Wyoming	1	1	2

Doctor MacLean showed a model in plaster of Paris of the button which was to be used as a badge of membership in the Volunteer Medical Service Corps. This model had been designed by Dr. Robert L. Dickinson, of Brooklyn, and modeled by Paul Manship, the distinguished sculptor.

During the course of the discussion the fact was brought out very clearly that membership in the volunteer medical service corps did not of itself protect one from being drafted.

It was also brought out that if a medical practitioner has applied for admission to the Medical Reserve Corps and has been rejected solely on ac-

count of physical disability and is afterwards accepted by the draft board such practitioner, if his professional and moral qualifications were satisfactory to the Surgeon General, would be transferred from the National Army to the Medical Reserve Corps after he had made application in due form to his immediate superior for such transfer, setting forth in full the facts in the case, and his professional qualifications.

SENATOR OWEN EXPLAINS THE OWEN-DYER BILL.

Senator Robert K. Owen, of Oklahoma, was then introduced and explained the main features of the Owen bill and the reason why it should be enacted by Congress. He said that the proportion of general officers provided for in this bill was only one half as many as were provided for in the organization of the French and the British medical services. He said that had such a bill been enacted prior to war with Spain we should not have had the disgraceful conditions existing which did exist at Chickamauga, when one fourth of the entire command was stricken with typhoid fever because the commanding officer would not heed the advice of the medical officers of his staff.

Dr. Rosalie Slaughter Morton was introduced and spoke briefly of what the women physicians of the country wished to do to help out. Doctor South, state bacteriologist of the State of Kentucky, said that as one contribution of women to the cause she might state that she had examined 5,000 men for hookworm disease for the army, beside making other examinations for the army.

The annual meeting of the state committees was then adjourned.

MEETING OF THE GENERAL MEDICAL BOARD OF THE COUNCIL OF NATIONAL DEFENSE.

Review of Work of Organizing Medicine.—The Owen-Dyer Bill.—Ninety-eight Thousand Nurses Available.

The Council of National Defense is composed of the Secretaries of War, of the Navy, the Interior, of Agriculture, of Commerce and of Labor. This Council has nominated, and the President has appointed, an Advisory Commission of specially qualified persons, each having a knowledge of one great field. Dr. Franklin H. Martin, of Chicago, was appointed a member of the commission as representing medicine and as such became chairman of the committee on medicine and sanitation of the commission. In this capacity he organized a general medical board for the purpose of using the enormous expansion of the various Government bureaus in the organization of the medical profession for war. This general medical board originally consisted of thirty-five of the best known medical men in the United States. Ten of the original members had gone abroad for active service overseas. The board had been enlarged to seventy-seven members, including officers of the principal surgical and medical societies, the army, the navy, the Public Health Service, and twenty-two of these were on active duty in Washington.

Recommendations were made to it, and medical questions referred to it for discussion. Such medical problems as develop from the activities of the committees of the medical section—the board's operating body, of which Major F. F. Simpson is chief—were considered at the monthly meetings of the board, usually held on Sunday, and referred, if deemed advisable, to the Monday morning meetings of the executive committee of ten (which included the surgeons general of the army, navy and Public Health Service, the chairman and vice chairman of the board, Lieutenant Colonel Victor C. Vaughan, Lieutenant Colonel William H. Welch, Major William J. Mayo, Rear Admiral Cary T. Grayson and Major William F. Snow, secretary. If a recommendation of a committee were approved by the executive committee, it was laid before the Advisory Commission or the Council of National Defense, or both, by Dr. Martin, who was thus the link between the profession and the President's cabinet. In this way there was official, executive action. If approved, the recommendations, for final working out, were referred back to the General Medical Board, or distributed in the way of information to those in authority in the bureaus concerned. The General Medical Board kept in touch with all state and county committees and through them with all the sectional medical societies.

The annual meeting of this General Medical Board was held in the Hotel Willard on Sunday morning, May 5th, the meeting being called to order by the chairman, Major Franklin Martin. Senator Howard Sutherland, of West Virginia, was introduced by the chairman and made a brief address on the services rendered by the medical profession to the nation in its time of stress.

Surgeon General Gorgas spoke of the Owen-Dyer bill now before Congress and which provides five generals, forty colonels, and eighty lieutenant colonels for each 1,000 medical officers, and pointed out that it was due to the large number of physicians who had joined the Medical Reserve Corps from civil life that this bill should be enacted so as to give them adequate rank for the better enforcement of their orders. It was in the interests also of the army that these men should be given authority, as otherwise their recommendations would have little or no weight with the line officers, to the great detriment of the health of the men in the service.

Major Bascom Johnson, of Cleveland, Ohio, made a brief report for the commission on training camp activities, a commission whose primary object was the prevention of venereal diseases, though this involved the provision of suitable entertainment and supervision of the general social welfare of the troops. Dr. Edward P. Davis spoke for the central governing board of the Volunteer Medical Service Corps; Major W. F. Snow made a report on civilian cooperation in preventing venereal diseases. Lieutenant Colonel Victor C. Vaughan spoke briefly for the committee on legislation, Inspector Joseph Murphy on behalf of the Surgeon General of the Navy regarding the naval medical service, and Hosmer Smith outlined the work done by the board in the matter of

supervising the purchase of medical supplies. Colonel R. E. Noble spoke of the work which had been done by the Surgeon General's Office in providing hospital facilities, saying that we now had four general hospitals with a capacity of 4,000 beds, which meant over 62,000 beds available, and that by July 1st this would be increased to 90,000. At present we had 22,000 empty beds in our hospitals, so that we will be quite able to take care of all who may be sent. Dr. Otto P. Geier, of Cincinnati, spoke on behalf of the industrial organizations, saying that the Government had a right to demand that the industrial communities should mobilize their energy for increased production by proper organization and by proper care of the maimed. He said that thirty times as many men were maimed in civil life as were expected to be maimed in the army. The application of intensive preventive methods would reduce this materially.

Lieutenant Colonel W. H. Welch, of Johns Hopkins, said that there were about 98,162 nurses available in the United States. The number of students had been increased by 3,803 through special efforts made to induce larger numbers of nurses to equip themselves for work in the army, and was followed by Mrs. Greeley, of Washington, who made an admirable and spirited address, urging the desirability of the enactment of a law now before Congress which provides for relative rank for the nurses. Colonel Frank Billings spoke of the work of reconstruction of the maimed soldiers and its important relation to the future industrial life of the country. He outlined plans which had been formulated for carrying on this work.

Dr. Rosalie Slaughter Morton said that there were 6,126 women physicians of whom forty per cent. had volunteered for war service. The meeting concluded with a report of Dr. Edward H. Martin, of Philadelphia, on the states committees activities.

FIT TO FIGHT.

On Sunday afternoon, May 5th, Major Snow of the Division on the Prevention of Venereal Diseases, of the Surgeon General's Office, and Colonel W. O. Owen, curator of the Army Medical Museum, presented a special film drama which had been prepared by the joint work of Major Snow, E. W. Griffith, the film producer, and Colonel Owen's staff of photographers. This drama told the story of a group of young men who joined the service; how they were tempted by liquor and by prostitutes and how some fell and became invalids, suffering from syphilis and gonorrhea, and gonorrheal rheumatism and were thereby debarred from the privilege of going abroad. The story was told forcibly, clearly, and without equivocation. The subject was excellent and seemed to be well chosen. The subject was handled without gloves and the object sought will no doubt be obtained of impressing upon men in the service the dangers which are involved in consorting with prostitutes. One of the scenes shows the parlor in the ordinary house of prostitution and others showed the hospitals where the men went for treatment after becoming infected. It is the intention of the Surgeon General's Office to

present this film throughout the various camps so as to impress the young men with the great danger they run of being infected by consorting with prostitutes.

THE DINNER.

In response to an invitation from the committee on medicine of the Council of National Defense the members of the state committees dined at the Army and Navy Club on Saturday evening. Dr. Franklin Martin introduced Doctor Davis, of Philadelphia, who responded to the toast to the Commander in Chief of the Army and Navy of the United States.

After a brief address from Surgeon General Gorgas, the toastmaster introduced General Braisted, Surgeon General of the Navy, who spoke of the navy's part in the war. Colonel Frank Billings, of Chicago, chief of the Division of Reconstruction of the Surgeon General's Staff, spoke of the part of the Medical Reserve Corps in the war.

Major F. F. Simpson, of Pittsburgh, drew a gloomy picture of the possibilities of defeat.

Dr. John Bowman, of Chicago, Major Taggart, of Tennessee, and Major W. W. Keen, of Philadelphia, spoke briefly and to the point.

MEDICAL NEWS FROM WASHINGTON.

Discontent with the System of Promotion in the Navy.—Number of the Regular Army Medical Corps Specified.—Unfit Medical Reservists.—The Safe Transport of Wounded Overseas.—Gorgas Objects to Irregular Practitioners in the Army.

Considerable discontent prevails in the medical personnel of the navy, particularly among reserve officers, on account of the system of promotion which deals with them. It has been decided that automatic progression of individuals in the reserve force of the naval establishment shall depend upon active duty at sea, which, it is pointed out, is fair enough for line officers, but operates to the decided disadvantage of the naval medical reservists, who enter the service with the rank of junior lieutenant and only six per cent. of whom are on sea duty, the remainder performing equally important work at the training camps and hospitals on shore. This rule of promotion creates an indefinite delay in the advancement of medical reservists, some of whom, by reason of their age and professional experience, feel that they are entitled to higher rank than now is possible under the existing system. Moreover, the naval medical reserve officers cannot but feel depressed by a comparison of the circumstances surrounding their careers with the system of promotion that applies to reserve officers of the Army Medical Department, many of whom have the rank of major and some of whom have been transferred to the National Army as lieutenant colonel or colonel. All this jeopardizes the plans for the increase of the medical personnel of the navy, for which branch it is necessary to obtain during the next twelve months at least 1,000, and possibly double that number, of physicians.

It is understood that the decision of the War Department as to the authorized strength of the regu-

lar army as determining the number of officers of the regular Medical Corps will specify 286,000 as the basis of calculation. This will find the Medical Corps with a surplus of one colonel and two lieutenant colonels, but they will be absorbed by November as a result of the retirement for age of Col. R. G. Ebert in August, Maj. Gen. William C. Gorgas in October, and Brig. Gen. Charles Richard in November.

The basis of enlisted personnel decided upon will give the Medical Corps of the regular army 474 majors with 175 vacancies, besides the allowance for the higher grades. There are no captains at present, and there are 390 first lieutenants, leaving 1,133 vacancies to be filled. The first lieutenants, under existing law, must serve one year as such, and the next class to be promoted to the grade of captain will be advanced in August, followed by a second class in September, a third in November, and a few nearly every month thereafter. Until the vacancies in the grade of major are filled, those promoted to captain also will be advanced to major on the same day. It is understood that a regular army of 300,000 officers and enlisted men of the line and staff will be used as a basis of determining the allowance of dental officers of the regular army. Therefore, the Dental Corps will have 300 officers. Counting the twenty-four candidates recently found qualified for appointment there remain seventy vacancies to be filled.

* * * * *

Numerous changes are occurring frequently in the personnel of the Medical Reserve Corps, due to the fact that it has been adopted as a policy not to retain medical reservists that are found physically disqualified or who do not measure up to the professional standard of the corps or who seek to impose conditions upon assignment to duty. It is desired, because it is necessary, to have medical officers able to respond to any call without delay; and, if there is any question as to ability of an individual officer, he is transferred to the inactive list or honorably discharged. Accordingly, many medical reservists are being so transferred or discharged.

* * * * *

The navy has provided the sanitary personnel of commissioned officers and hospital corps men for most of the army transports which take troops overseas and bring back the wounded to this country. This duty, assigned to the Navy Medical Corps, has made a heavy draft on medical officers and enlisted men, but it has been met adequately and promptly. This work was assigned to the Medical Department of the Navy because it would have been almost impossible, without the organization of a special service, for the army to have undertaken it. The medical supplies of the troops for use overseas are stowed in the hold, to be ready for removal intact upon debarkation. The navy medical officers have been given a special course of instruction in hygiene on shipboard, but what the army surgeons might learn for use on a single voyage would be of little practical value after that one trip.

The navy medical officers on a transport have charge of all sick bays and provide all surgical sup-

plies for use during the voyage. The army medical officers are expected to oversee their own commands, to enforce observance of all health rules on the part of the men, and to require all those sick or exposed to communicable disease to report at the sick bays for treatment. On the return voyage, the wounded being brought back to this country are exclusively under the charge of the navy medical officers. Due in great measure to the isolation and inspection of troops before and after reaching points of embarkation, little sickness has marked the passage of our troops to France. Moreover, up to this time, no deaths have occurred among invalids on return voyages, and the accommodations on the large transports are so complete that it is possible to make the sick very comfortable.

* * * * *

The Surgeon General of the Army is unalterably opposed to any legislation (such as has been suggested in certain quarters and such as members of Congress are being importuned to enact) permitting appointment of osteopaths and other sects to the personnel of the Army Medical Department. He believes that there should be no departure from the fixed rules prescribing the qualifications for candidates for the medical service. In a memorandum on the subject recently submitted to the Adjutant General of the Army, Surgeon General Gorgas says: "The time has long passed for exclusive adherence to any particular school of medical doctrine or practice, such as is implied by the degree of doctor of osteopathy, of chiropractic, of naturopathy, of mechanotherapy, of electric medicine, or any other 'pathy.' The terms 'allopathy,' 'old school,' etc., are equally objectionable. A scientifically educated physician is at liberty, and it is his duty, to employ any method of treatment whatever which he believes will benefit his patient. Homeopathic physicians have the degree of doctor of medicine, and some of their schools furnish an adequate medical education. They have for the most part abandoned their exclusive dogmas; as a class they are rapidly declining in numbers and are being merged in the general profession of medicine. They are eligible to qualify for the Medical Corps of the Army. While practice based upon the peculiar tenets of osteopathy may be beneficial in suitable cases, the same or similar methods are open to the use of any physician. Osteopathic procedure applied to cases unsuited for them, as often done, results in serious harm. The only safeguard against such adherence to exclusive systems is a good medical education, such as now is demanded for admission to the Medical Corps.

"It would be most objectionable to recognize any sort of medical practitioners in the Medical Department of the Army, be it osteopathic, allopathic, eclectic, chiropractic, or any other of the countless sects. Members of the regular profession of medicine, who now enter the Medical Corps, are merely educated physicians and do not constitute a sect in medicine, allopathic or otherwise. They are simply physicians free to follow any method of treatment which they may deem beneficial, in the same sense that a chemist is a chemist and a physician is a physician."

Editorial Notes and Comments

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TWO YEARS OF WAR.

While the military forces of the United States have only been at war for a year and a month, the doctors have been concerned with war for two years, for it was on April 6, 1916, that Dr. Franklin H. Martin, of Chicago, and Dr. F. F. Simpson, of Pittsburgh, brought together the leaders in the principal national medical organizations and formed a committee of the medical profession on war activities. This committee laid out a preliminary program of organization which, within a few months' time, resulted in a collation of invaluable data regarding the status of the members of the medical profession, with a view to their availability in case war should be declared by the United States. While no overt action was taken which could possibly be construed as nonneutral, the work of tabulating the personnel of the medical profession of the United States and of stimulating the interest of the profession in medical service in the army was carried on systematically by Doctor Martin and Doctor Simpson, with the co-operation of other leaders of the profession, from that time until the organization of the advisory

commission of the National Council of Defense gave official status to them and their work.

Therefore, we feel justified in speaking of the medical profession as having had two years of war, the first being preparatory. The first annual meeting of the state committees on medical defense which act under the General Medical Board is reported at some length in this issue of the NEW YORK MEDICAL JOURNAL. So important is this report that we have been compelled to make room for it by the omission of two articles, publication of which we had promised our readers for this issue. These articles by Colonel H. M. W. Gray, A. M. S., on The Treatment of Gunshot Injuries of the Spinal Cord at Clearing Stations, and by Dr. Charles Greene Cumston, of Geneva, on The Septic Treatment of Wounds will, therefore, be held over for our next issue, so as to report this very interesting meeting.

WEATHER AND HEALTH.

Certain monthly health reports always include, without comment, the weather bulletin. It is well, if any one pays any attention to it, for there has been a serious tendency to overlook the influence of meteorological states on health conditions. For a time it seemed as if "colds" and bronchitis and pneumonia and sore throats were to be altogether dissociated from low temperatures. Their frequency in the winter months was not to be denied, but their cause was attributed to bacteria or to "closed windows," forgetting that the cause of closed windows was the cold and that bacteria flourish in summer as well as in winter. Again, dust was given undue credit for the spread of colds in spring, forgetting that winds which kick up dust extract heat from the body far faster than air at comparative rest. It was forgotten also by the enthusiasts for the bacterial aspect of respiratory diseases that immunity to disease in animals may be broken down by enforced exposure to cold, and that in the Arctic regions colds and influenza are "a veritable plague."

We do well to preach the undesirability of pampering the body and the danger of lowering the resistance to cold by keeping rooms at too high a temperature and by dressing too heavily in the house, but we should never belittle the great danger of too long exposure to cold, of going without overshoes, or scantily clad in those months which, from time immemorial, have been most fatal to the great ill.

March and April, when the body has become tired of its uphill fight against the persistent forces of cold and wet and wind. The very young aside, it is cold that is the handiest servant of death, and this simple fact, as old as human experience, should not be lost sight of in the glamour of more recently learned etiological details.

The monthly weather bulletin of the future will have more significance beside the monthly morbidity and mortality report than it now has. There will be more to it, for undoubtedly known and probably unknown meteorological factors have a decided effect on bodily resistance to disease, or influence bacterial growth and virulence. The presence and varying nature of disease in epidemics may be due to changes in the infecting organism brought about by its sojourn in peculiar human soil, but it would seem that some larger influence is at work, either on the host or the parasite, and the next successful drive against contagious disease may be by way of meteorology.

WAR NEURITIS.

Much magazine literature in the past three years has made us fairly familiar, theoretically at least, with the condition variously known as shell shock, war neurosis, war shock, etc., but we have not heard much about war neuritis, although the published observations of Tinell, Athanassio-Benisty, Babinski, Weil, Marie, and others, offer a wealth of neurological material. Of these writers Madame Benisty and M. Marie have emphasized especially the extremely painful affections following injuries to large nerve trunks. It is a bit difficult to explain why some wounds are very painful, while others, apparently accompanied by exactly the same amount of nerve injury, are practically painless. About the nearest approach to a formula of any kind is the discovery that certain nerve trunks react more readily than others to painful sensations; the chief of these are the median and sciatic, more rarely the ulnar and the crural. Occasionally nerve pains following wounds persist and, instead of improving, grow gradually worse until they become unbearable; and soldiers have even been driven to thoughts of suicide by this suffering.

Thus history repeats itself! In our Civil War, Weir Mitchell, W. W. Keen, and George R. Morehouse called attention to the agony endured by some wounded soldiers, whose sufferings resisted every therapeutic aid. To this condition they applied the term "causalgia." Last year J. S. B. Stopford, of England, suggested the additional term, "thermalgia."

In a recent article Major Sicard, of the French army, has described some of his experiences with painful neuritis following wounds.¹ Major Sicard and his associates literally tried everything: hot air, steam baths, radiant light, constriction, electricity, injections of gas and serum subcutaneously, and of air or cocaine serum in the nerve sheath, even dividing and reuniting the nerve. The whole gamut of internal therapy was run from coal tar products to morphine, with only temporary results.

Finally Doctor Sicard had recourse to the injection of alcohol intraneurally, which gave good results in the twenty-one cases where it was tried. This was done usually under a general, but occasionally under a local anesthetic. The nerve is freed from adjacent tissue and from one to two c. c. of alcohol of from sixty to eighty degrees is injected. The results obtained were very encouraging. Nine ceased to suffer immediately after injection, and in forty-three cases treated by Sicard and his colleagues there was only one case of nonsuccess. He concludes that in all refractory cases of painful affections alcoholization of the nerve trunk above the wound should be tried, after the ordinary therapeutic methods have failed.

Of course this treatment contains nothing new, having had its advocates and opponents since the first studies of Pitres and Vaillard twenty-five years ago; but the fact that it has given such good results in these distressingly painful cases should be borne in mind by our own military surgeons, for we will undoubtedly have a number of these cases before long.

THE VOLUNTEER MEDICAL SERVICE CORPS.

At the first annual meeting of the State Committees of the Medical Section of the Council of National Defense, held at Washington on May 4th, provision was made for the utilization of the services of members of the medical profession who are debarred from admission to the Medical Reserve Corps on account of physical disability, sex, age, essential public, or institutional need, or dependents, through the organization of a Volunteer Medical Service Corps. All physicians are eligible to this corps who would, but for the above named reasons, be eligible to the Medical Reserve Corps of the Army. The corps has been established as an emergency medical organization to perform, when required, such civic and military duties as are not provided for under the existing organization. The

¹Painful Neuritis Resulting from Wounds of War. Treatment by Alcoholization of the Nerves. By J. S. Sicard, Médecin Chef, Major 1ere cl. *Lancet*, February 9, 1918.

services of its members will be rendered in response to requests from a central governing board at a call emanating either from the Surgeon General of the Army, the Surgeon General of the Navy, the Surgeon General of the Public Health Service, the General Medical Board of the Council of National Defense, or from other duly authorized departments or associations.

There is to be a central governing body and state governing boards, the latter being composed of members of the state committees of the Medical Section of the Council of National Defense, which are already in existence. The central governing board, constitutes a committee of the General Medical Board of the Council of National Defense, and consists of eight active members and two exofficio members, Dr. Franklin Martin and Dr. F. F. Simpson.

The new organization fills a distinct need. There are many men in medicine past the age of fifty-five who are capable of performing valuable services for state or government. Under existing army regulations these men cannot be made use of, but the Volunteer Medical Service Corps affords an opportunity to become an integral part of the medical organization of the government.

There are also many who are kept from active medical service by minor physical disabilities who will likewise be glad to do what is in their power, and these also are made available in the new organization. For the first time the services of women physicians are made available through this organization. It is true that there are one or two special units organized by women physicians, but women doctors as a whole, have not been made use of as they could have been and will be under the new organization. The Council of National Defense, which has organized this service and authorized its permanent organization, is to be congratulated upon wisdom and foresight in devising a method for the utilization of this large number of medical men and women whose services might not otherwise be available.

THE SUICIDE'S CHOICE.

Any one who has time to read the minor happenings in the daily press will have noticed that an accident or crime is sure to be duplicated, even triplicated, within the week. If a youth kills his father, there ensues an epidemic of parent killing. The boy who "didn't know the gun was loaded" and shoots his sister, seems to bring about a whole series of gun accidents. Recently a young woman jumped to death from the window of a New York hotel without apparent reason. That same day the wife of a consul, who was ill,

"fell" from her window. The day following, a young man, a typhoid patient in a hospital, does the same thing; a soldier jumps from a window that evening, and on the next day "a young woman plunges to death from a New York hotel," while a tuberculous patient in a sanatorium "either fell or jumped and was killed." The reporter uses his verbs carefully. Where there is disappointed love, the person "plunges"; where no reason can be assigned, he "jumps." The rich man, who, in the eyes of a poor reporter can have no reason for the act, "falls" from the window. Admitting that some fall against their inclination, all fall on the stones and are usually killed. We once saw a woman throw herself out because she was so joyful, but this only happened once.

There must be a certain amount of imitativeness in this mode of suicide, for it is hardly one to be chosen deliberately, even by a suicide; the crash against the pavement; the horrible possibility of a lingering death agony, seem enough to deter. Of course, there is the recognized desire which comes over many when standing at a great height to throw themselves down; that is why public monuments are often caged in at the top, but the suicide generally seeks seclusion; locking himself into his room to take poison or cut his throat; waiting until the river banks are deserted before throwing himself in, so it would almost seem that it is a love of display; a desire to be for once the object of public talk; a wish to make one deed stand out in an eventless, dull life which induces men to startle foot passengers by hurtling into their midst and bespattering them with blood.

A MINISTER OF HEALTH AND THE BABY

Both the lay and the medical press in England constantly reiterate that the appointment of a Ministry of Health would save some 5,000 babies a week, who now die because it is lacking. But a sarcastic medico asks how "the swarm of inspectors, subinspectors, and deputy subinspectors, all with 'cushy' jobs at Whitehall, hours ten to four, and good salaries" propose to begin this mighty piece of work? Properly carried out, it would revolutionize the whole system of labor and include an entirely new attitude toward the young prostitute, the "girl who goes wrong," both included now under the delicate title of "the unmarried mother." For many years indirect efforts were chiefly made by trying to reform boys and girls in "Institutions," then older boys and girls were reached by Friendly Guilds and Christian Associations, the "unmarried mothers" being safely put away in Homes of Hope: their babies generally taken away, and they, to wash their souls, without any proper clothes. The consequence

with this were endless Day Nurseries, Mother's Meetings, beer and 'baccy clubs for the men, but all usually carried out by those who liked the poor to echo the sentiment:

Let us love our occupations,
Bless the Squire and his relations;
Live upon our daily rations,
Always know our proper stations,

and had no idea that another thirty years would see them involuntarily forced to further the working man in his own version:

Eight hours to work,
Eight hours to play,
Eight hours to sleep,
Eight bob a day.

But, to return to the babies, and the question, "Where to begin?" Clearly not with them, even if taken in hand from the hour of birth, for disease and deformity have already had an innings. Shall the "expectant mother" be the object of civic solicitude? Still too late, the involuntary heritage has already been used by the unborn baby. But, after all, we travel in a circle, for the only real reform will consist in dealing with the infant who already exists as the future parent, guiding its childhood, its youth, its betrothal, and by wise domestic, social, and civic guidance and laws giving it in its surroundings and work all that decency demands and comfort requires, so fitting it to be a willing cooperator in peopling the world with fine, lusty children. Then shall we hear no more an innocent branded as a "child of shame," a "didn't ought," or a "love child."

PSEUDOPSYCHOLOGY.

Some of the more intelligent laity are becoming rather restive under the searching examination made into their mental, physical, and moral condition by learned psychologists who speak a language new to those of the nineteenth century and haunt the bedside to evolve mystic meaning in the languorous dream and the galloping nightmare. It seems to them that a time is coming when a rational act will be classed as done in "a moment of temporary sanity." They buy "popular" works and try to read them as they whirl along on the Elevated or give the frayed end of a tiring day to study out the matter.

Our sympathy, to a certain extent, is with the layman, because a great mass of literature is piling up which lacks lucidity and even sense. This is owing to an idea which some minor authors seem to have, that all words beginning with "psycho" are interchangeable terms, whereas there is just that delicate difference to which only the man who has had a classical education is sensitive, and who reads with a shudder that "a digital examination should be made with the fingers" or of the nervous patient listed under four or five distinct psychic conditions in one article. Matters are growing worse now that the Higher Thought culturists are tagging psychologic terms on to the crude and bewildering sentiments they deal out on Sundays vocally, or in the daintily bound volumes sold by their devotees in the vestibules of the dimly lighted theatres, where, clad

in white or flowing Eastern robes and with the light falling on them only, the professors pour out eloquent nonsense. But we recall hopefully the fact that exactly the same kind of speaker and literature spread over the States in 1909 when every one was going to and talking of the "mind cures," especially those at Boston. All that was good remains, and all the queer literature, with its stodgy platitudes and vaporous muzziness, may still be found by the curious in the small second hand bookstalls, labeled "this lot 10 cents each."

A LOSS TO THE CITY.

Dr. Charles F. Bolduan, for the past fourteen years a member of the staff of the Commissioner of Health of the City of New York, and for the past four and a half years director of the Bureau of Public Health Education, is about to resign from the department in order to take up work elsewhere. For two years Doctor Bolduan served as a bacteriologist in the city laboratory under Dr. William H. Park, for nine years he was assistant to Dr. Hermann M. Biggs, the general medical officer of the department, and four and a half years ago was made director of the Bureau of Public Health Education, a bureau which was first proposed by him in a report submitted to Doctor Lederle, but which was not inaugurated until after Doctor Goldwater had been made Commissioner of Health. Since the inauguration of this bureau similar ones have been established in many cities throughout the United States and the suggestion by Mayor Hylan that the bureau could be discontinued brought out numerous protests from the leaders of the medical profession not only in New York but elsewhere. Doctor Bolduan's retirement from the department will be a distinct loss to the city, as he has been an energetic, intelligent and efficient public servant.

RELATIVE RANK FOR ARMY NURSES.

We note with pleasure that the Surgeon General is reported in the daily press as having expressed himself in favor of the passage of a bill giving relative rank to army nurses. In this we are following the example of our antipodean allies, the Australians, who have found relative rank for the army nurses very helpful in promoting hospital discipline. The army nurse has occupied rather an anomalous position, for the chief nurses and matrons were compelled to exercise authority over the enlisted personnel of the ward, but as they were looked upon by the enlisted men as being merely civilian employees their authority was sometimes disregarded to the detriment of discipline. This relative rank does not carry any increase in pay, nor any of the emoluments or privileges which go with positive rank, but it does carry with it the right of command over the personnel in and around military hospitals. No one who heard the excellent presentation of the arguments in favor of this measure made by Mrs. Greeley before the General Medical Board on May 6th could fail to recognize their weight and the justice of the plea so ably put forward by her.

News Items.

Red Cross Week.—President Wilson has issued a proclamation fixing the week of May 20th as Red Cross Week. During that week the American Red Cross will conduct a second campaign to raise \$100,000,000.

Two City Hospitals to Be Turned Over to the Government.—It is reported that the Federal Government will take over Sea View Hospital on Staten Island and the Otisville Sanatorium, Otisville, N. Y., and as necessity arises, other hospitals will be turned over to the government. Extensive improvements will be made in both institutions.

Public Health Nurses Needed.—Announcement is made that the American Red Cross has allotted \$25,000 to the Henry Street Settlement to be used in the work of training public health nurses, who are needed here and for reconstruction work in France. The course will be open to three year undergraduate nurses and will last from June 1st to September 30th.

Meetings of Medical Societies to Be Held in Philadelphia during the Coming Week.—Monday, May 13th, County Medical Society (directors), Samaritan Hospital Medical Society; Tuesday, May 14th, Pediatric Society; Wednesday, May 15th, Section in Industrial Medicine and Public Health, College of Physicians; Thursday, May 16th, Academy of Dermatology, and the Southeast and Northeast Branches of the County Medical Society.

Rockefeller Hospital in France Bombed by Germans.—The hospital established in France near the front by Dr. Alexis Carrel, of the Rockefeller Institute, has been persistently bombed by German aviators and now is almost destroyed, despite the fact that it constantly flew a flag bearing a huge red cross and was further identified by an immense white cross marked on the lawn. The wounded were successfully removed early in April. Doctor Carrel will install the hospital in Paris or the suburbs.

Medical Corps Promotions.—The following promotions in the Medical Corps of the National Army, with rank from February 27, 1918, have been announced: To be lieutenant colonels, Major Louis H. Hanson, Major Charles W. Haverkamp, Major Thomas E. Scott, Major John M. Willis, Major Ferdinand Schmitter, Major Shelley U. Marietta, Major Neal N. Wood, Major Thomas D. Woodson, Major Roy C. Heflebower, Major James E. Baylis, Major Arthur O. Davis, and Major William H. Smith.

Many Positions Vacant in Health Department.—It is said that there are at present 121 vacancies to be filled in the Department of Health of the City of New York. The vacant positions range from nurse to assistant sanitary superintendent and include assistant sanitary superintendent at \$3,500 a year; three food inspectors, five medical inspectors, three assistant physicians, three hospital physicians, and thirty nurses. Many of these places have been vacant since the first of the year. It is said that the work of the department has been seriously hampered by the delay in filling these positions.

Women's Medical Society of New York State.—The twelfth annual meeting of this society will be held at the Hotel Ten Eyck, Albany, Monday, May 20th, under the presidency of Dr. Emily Dunning Barringer, of New York. An excellent program has been prepared which includes papers on timely topics by Dr. Mary Crawford, Dr. Rosalie Slaughter Morton, Dr. Helen Montague, Miss Pauline Goldmark, Dr. Jennie Harris, Dr. Marion Craig Potter, Dr. Sarah I. McNutt, and Dr. Bertha Van Hoesen. Dr. Ethel D. Brown, 133 East Nineteenth Street, New York, secretary of the society, will be glad to furnish complete programs to all who are interested.

American Society for Clinical Investigation.—The annual meeting of this society was held in Atlantic City, N. J., Monday, May 6th, under the presidency of Dr. George Blumer, of Yale University. In his opening address Doctor Blumer emphasized the importance of maintaining medical schools in an efficient condition, pointing out that the present policy of depleting the staffs of the medical schools constituted a serious menace to medicine. Officers for the ensuing year were elected as follows: President, Dr. H. A. Christian, of Boston; vice-president, Dr. G. Canby Robinson, of St. Louis; treasurer, Dr. Alfred H. Hess, of New York; secretary, Dr. Walter W. Palmer, of New York; counselor, Dr. George Blumer, of New Haven.

Annual Meeting of the State Medical Society.—The on hundred and twelfth annual meeting of the Medical Society of the State of New York will be held in Albany, N. Y., May 21st, 22d, and 23d, under the presidency of Dr. Alexander Lambert, of New York.

Surgery at the Front.—At a stated meeting of the New York Academy of Medicine, to be held Thursday evening, May 16th, Major Charles L. Gibson, M. R. C., U. S. Army, who has recently returned from France, will give an informal talk on Surgery and Actual Surgical Conditions at the Front.

Association of American Physicians.—At the annual meeting of this association, held in Atlantic City, N. J., on Tuesday and Wednesday, May 7th and 8th, Dr. Alexander McPhedran, of Toronto, was elected president, succeeding Dr. Francis H. Williams, of Boston, and other officers were elected as follows: Dr. Hermann M. Biggs, of New York, vice-president; Dr. Thomas McCrae, of Philadelphia, secretary; Dr. W. W. Ford, of Baltimore, recorder; Dr. J. A. Capps, of Chicago, treasurer; Dr. Theobald Smith, of Princeton, and Dr. C. F. Martin, of Montreal, counselors.

Philadelphia Postgraduate School of Neurology.—This school, founded in 1914, has issued its third announcement. Courses of instruction in neurology and psychiatry have been arranged for officers included in the neuropsychiatric units, and for members of the Medical Reserve Corps who are attending the School of Neurological Surgery at the University of Pennsylvania. The wards of the Philadelphia General Hospital and the Philadelphia Hospital for the Insane have been placed at the disposal of both schools. For full information address Dr. Charles K. Mills, 1909 Chestnut Street, Philadelphia.

Meetings of Medical Societies to Be Held in New York during the Coming Week.—Monday, May 13th, Society of Medical Jurisprudence, New York Ophthalmological Society, Yorkville Medical Society, Williamsburg Medical Society; Tuesday, May 14th, New York Academy of Medicine (Section in Neurology and Psychiatry), Manhattan Dermatological Society (annual), the New York Obstetrical Society (annual); Wednesday, May 15th, New York Academy of Medicine (Section in Genitourinary Diseases), Society for Experimental Biology and Medicine, Medico-Legal Society, Northwestern Medical and Surgical Society of New York, the Women's Medical Association of New York City (annual), Alumni Association of City Hospital (annual); Thursday, May 16th, the New York Celtic Medical Society, New York Academy of Medicine (stated meetings); Friday, May 17th, New York Academy of Medicine (Section in Orthopedic Surgery), Clinical Society of the New York Postgraduate Medical School and Hospital, New York Microscopical Society, Brooklyn Medical Society.

Personal.—Dr. Abraham Jacobi celebrated his eighty-eighth birthday on May 6th, and was the recipient of congratulations from many illustrious members of the medical profession.

Assistant Surgeon Thomas F. Keating, United States Public Health Service, has resigned from the service, resignation to be effective June 3, 1918.

Dr. Joseph Engel, of 102 South Ninth Street, Brooklyn, has been appointed assistant radiographer to Bellevue Hospital.

Dr. J. G. Adami, of Montreal, Colonel, Canadian Army Medical Corps, has completed the first volume of his history of the corps. It will be published shortly.

Lieutenant Peter K. Olitsky, Medical Reserve Corps, U. S. Army, a member of the staff of the Rockefeller Institute for Medical Research, has been granted permission by the Surgeon General to go to Hong Kong to assist in controlling a local outbreak of meningitis. Doctor Olitsky will advise the Hong Kong government concerning the control of the disease, and especially in the preparation of an effective serum and the institution of other therapeutic and prophylactic measures.

Dr. Allan J. McLaughlin, who was granted leave of absence by the United States Public Health Service to become Surgeon General of the Hawaiian Islands, has been recalled and placed in charge of the Division of Interstate Quarantine. Dr. McLaughlin has been director of the department of communicable diseases in the United States Public Health Service since 1911. McLaughlin.

Modern Treatment and Preventive Medicine

A Compendium of Therapeutics and Prophylaxis, Original and Adapted

THE TREATMENT OF HEMOPHILIA.

By LOUIS T. DE M. SAJOUS, B. S., M. D.,
Philadelphia.

(Concluded from page 854.)

Organ extracts have been employed in hemophilia chiefly for local hemostatic purposes, presumably supplying a thromboplastic substance which in the hemophilic is not set free with sufficient rapidity at the site of bleeding to permit of prompt coagulation. At least one of the extracts of the ductless glands, however, appears to yield definite results when given by mouth. Déjace in 1897 and Combemale in 1898 seem to have been the first to apply thyroid treatment in excessive bleedings, but their cases were instances of purpura and not of familial hemophilia. R. Jones, 1900, and E. Fuller, 1903, reported—describing them as hemophilics—cases in which prompt benefit from thyroid treatment had been obtained. More conclusive, perhaps, as regards the value of thyroid products in true hemophilia—although Hess, 1916, maintains that purpura is sometimes hereditary—is a case reported by W. J. Taylor, 1905, in which, at the suggestion of C. E. de M. Sajous, thyroid substance was given to a boy 18 years old, member of a family of bleeders, who bled for weeks from the site of an operation for necrosis of the fibula following osteomyelitis. Various remedies had been tried in turn without result, but upon instituting thyroid medication a marked change for the better was seen almost immediately. After a week of this treatment all bleeding from the granulations ceased and the wound began to heal rapidly. In another case reported by Taylor, in which profuse bleeding had always followed even the simplest wounds—and purpuric spots at one time been noted—the coagulation time was reduced by thyroid substance, in doses of three grains three times a day, from eleven and one half minutes to two minutes and six seconds, and a nephropexy was performed without difficulty from hemorrhage, the wound in fact being “remarkably dry.” In a third case, that of a woman who had been a bleeder all her life and bled forty-eight hours after extraction of a tooth, thyroid substance was given for prophylactic purposes for two days before extraction of two other teeth. In spite of unusual trauma during the extraction, bleeding was less than occurs in the average normal subject.

Experiences such as the above would seem to render a trial of thyroid medication very advisable in the entire group of “bleeders.” Over serum or blood treatment this measure obviously has the advantage of greater ease of application. According to C. E. de M. Sajous, thyroid acts in these cases by stimulating the adrenals to an increased production of adrenoxidase, a ferment not only sustaining general tissue respiration but also taking part in coagulation, and of which the blood platelets are constituted.

The use of ovarian extract internally in hemophilia was suggested in 1904 by Lachlan Grant, who

employed it with the thought that the endocrine ovarian function in the female might be the factor which prevents actual manifestations of the disease in this sex among hemophilic families. His first successful case was in a boy, of known hemophilic tendency, with hemorrhage from a cut foot continuing in spite of all local treatment. The second case, reported in 1906, was that of an adult hemophilic with joint hemorrhages and flushings of the face and ears. Benefit followed the use of an ovarian extract in doses of two to five grains three or four times a day. While several other observers have likewise used ovarian extract in hemophilia, the results, on the whole, do not seem to have been as favorable as those obtained with thyroid preparations.

Local treatment where practicable in actual hemorrhage in hemophilics, presents many analogies to the systemic treatment already discussed. Ordinary hemostatic agents such as ferric solutions, stypticin, antipyrin, etc., together with local pressure, generally prove useless. Calcium chloride, gelatin, or adrenalin solutions, while sometimes effective, cannot be confidently relied on. Hahn, 1913, reported success in two cases of hemophilic bleeding from the gums in which the thermocautery was employed as a last resort. The best local measures, however, are, as in the constitutional treatment, those that overcome the specific deficiency in prothrombin or thromboplastic substance, which is responsible for the delay in coagulation at the bleeding point.

A mere kneading of the tissues surrounding the site of hemorrhage has at times proven sufficient to arrest the flow. Schloessmann, 1912, for example, was promptly successful with this simple procedure in a hemophilic who bled freely from an excoriation in the corner of the mouth after the extraction of a tooth. Upon later recurrence of bleeding the hemorrhage was again arrested at once by squeezing the tissues with the fingers. Such results are accounted for, according to Addis and others, by the liberation of an additional amount of thrombokinase from the kneaded tissues, much larger quantities of the kinase being required to induce rapid clotting in hemophilic than in normal blood.

Probably a more reliable method, however, is the local application of coagulating principles from an external source. A few drops of the practitioner's own blood or of normal blood from another person will frequently arrest the hemorrhage. Fresh normal blood serum used in a dressing over the point involved, after cleansing of the latter, exerts a powerful coagulating influence. For intranasal hemorrhage or bleeding teeth in hemophilics, serum is likewise appropriate, applied in the manner usual in these situations. As in the systemic treatment, fresh serum seems preferable to old serum, including diphtheria antitoxin, unless fresh. Baum, 1909, recorded a case in which hemorrhage that had continued for two days in spite of a compressive dress-

ing, adrenalin, and the thermocautery, ceased in a few minutes after application of a compress dipped in fresh antidiphtheria serum. Labbé, 1908, reported success with gauze dipped in fresh serum in a number of cases in which hemorrhage had persisted for hours after extraction of a tooth. Serum in the form of a dry powder—one of the most convenient therapeutic measures in this group—has also been employed with asserted good results.

Apparently of the same degree of utility in the local treatment as blood or serum preparations are various tissue extracts. Of interest and possibly of definite significance in relation to the internal thyroid treatment of hemophilia is Schloessmann's commendation of fresh goiter tissue material—parenchymatous hyperplastic thyroid material, not cystic or colloid goiter tissue—as the most effectual local hemostatic remedy known for hemophilic hemorrhage. This material, where available, can be sterilized, he states, without loss of therapeutic activity and appears to retain its properties for a considerable period. Kottmann, 1910, recommended as a source of thrombokinase for local use fresh liver tissue from a rabbit or other animal, chopped, ground, and soaked in water, the turbid suspension obtained after filtration through ordinary cloth being then applied at the site of bleeding. Kinnicutt, 1905, wrote concerning the local use of a mixture of a 0.5 per cent. solution of calcium chloride with one sixth its volume of a solution of nuclealbumin—the latter made by mincing testis, thymus, thyroid, or ovarian tissue in a one in 500 solution of sodium carbonate and filtering through gauze after a few minutes. Nolf, 1910, relies on extracts of the spleen and lymph glands as well as the thymus. Hurwitz and Lucas, 1916, lay stress on the local hemostatic effect of a 2½ per cent. solution of Kephalin, freshly prepared, sterilized, and applied on gauze with firm pressure. They also mixed kephalin with sterile petrolatum and packed it into a wound in a hemophilic, with good results. The actual favorable effect of local measures such as these has been substantiated from the laboratory standpoint by Minot and Lee, 1916, who ascertained that, like normal blood platelets, kephalin or tissue extracts bring about rapid coagulation when added *in vitro* to hemophilic plasma or blood. In all but the mildest cases combined local and systemic measures are advantageous, the former having for their purpose to check the bleeding immediately, while the latter assists in preventing recurrence and, if necessary, reaches sites of hemorrhage inaccessible to direct remedial applications.

The Effect of Trauma upon the Laryngeal Nerve.—E. S. Judd, G. B. New, and F. C. Mann (*Annals of Surgery*, March, 1918) conclude that: Section of the recurrent laryngeal nerve produces complete paralysis of the vocal cord of the corresponding side which in all probability will be permanent. Ligation of the recurrent laryngeal nerve with linen, chromic catgut, or plain catgut produces complete and probably permanent paralysis of the vocal cord of the corresponding side. Stretching the recurrent laryngeal nerves acutely in a manner similar but of longer duration and in-

tensity than occurs in operation does not impair the function of the vocal cord. Stretching the recurrent laryngeal nerves for a long period, as over muscles, impairs the function of the vocal cords, but the impairment is probably due to the operative trauma and not to the stretching. Pinching the recurrent laryngeal nerves with a hemostat in a manner similar to that which may occur in an operation, produces temporary paralysis of the vocal cords. Restoration of function always occurs, the length of time necessary for restoration depending on the anatomical point at which the nerve was crushed. The time found necessary for complete regeneration of the nerve when injured in the areas usually traumatized by operation varies between thirty and sixty days. Exploration of the recurrent laryngeal nerves produces an effect on the vocal cords depending on the amount of trauma to which the nerves are subjected. Careful dissection will probably not produce any effect; the paralyses noted were probably due to pinching and other traumatic procedures.

Subacromial Bursitis.—Hilbert F. Day (*Boston Medical and Surgical Journal*, March 21, 1908) observed sixty-four cases of subacromial bursitis in the course of three years and nine months, acute twenty-six, subacute twenty-five, chronic thirteen. Acute cases are given aspirin for their pain and treated as suggested by Brickner by being put to bed in a semirecumbent position, supported on pillows not too soft. The affected arm is abducted on a pillow as far as it comfortably can be. A muslin bandage is looped about the wrist and fastened to a convenient spot at the head of the bed. The upper end of the bed is then elevated, and as the patient's body gradually slides down his arm travels relatively farther and farther up, and thus a shoulder that obstinately resists forcible efforts at abduction yields steadily and painlessly to this gradual countertraction. The cure is accomplished in from five to twelve days. Aspiration of the bursa is said to be helpful when there is a large amount of effusion into it causing intense, constant pain, but he has never employed it. When there has been a partial rupture of the supraspinatus tendon, long weeks of disability may be saved by an operation. A two or three inch incision is made from the acromion process down over the greater tuberosity of the humerus, the fibres of the deltoid separated, the roof of the bursa exposed and incised. Pulling downward on the arm sometimes allows the bursa to fill with air and make its cavity easier to explore. Villous masses or adhesions can now be cut away. The floor of the bursa may be reddened and puffed up with a whitish centre, which, when incised, extrudes a whitish material that should be scooped out, but not forcibly curetted. The floor of the bursa is then retracted to bring the tendon of the supraspinatus into view, which is next repaired with vertically placed sutures. The wound is then closed and the arm placed in abduction. Subacute cases, in which adhesions have formed, require more ingenuity and patience in treatment. Generally speaking, they may be handled in three different ways: By such an operation as has been described; by forcible breaking up of adhesions under anesthesia; by gradual stretching with massage, passive motion, Zander treatment, or ac-

tive exercises. The treatment of chronic cases, in which adhesions have been broken up and motion is possible, but perhaps painful, needs patience and considerable time. Patients of this type should have baking and massage at regular intervals, generally every other day, and should be given definite exercises to follow up by themselves. These exercises should be graded according to the amount of reaction they set up, and are best taken at night. One of the best preliminary exercises is to have the patient put his hand on a wall and slowly abduct the arm, creeping up the wall with his fingers. In all cases any possible focus of infection should be eliminated as a routine procedure, not because subacromial bursitis can be caused by infection, but because, given an injured bursa, secondary infection may keep up its inflammation.

Treatment of Painful Neuritis.—J. A. Sicard (*Lancet*, February 9, 1918) recommends the injection of the proximal portions of injured nerves for the relief of those cases of chronic, intense neuritic pain which not infrequently follow military injuries. Under a local or general anesthetic the nerve wound is exposed by incision and dissection. The nerve is freed from its adjacent tissues and one to two mils of sterilized sixty to eighty per cent. alcohol is injected with a fine needle directly into the substance of the nerve in a healthy portion about three to four centimetres above the site of the injury. All the nerve trunks supplying the painful region must be injected and where there has been a previous operation to free the nerve or to suture it the injection must be made above the upper limit of the former operation. The treatment should be employed only in the cases of very intense, persistent pain not relieved by simple measures. The injections cause some motor paresis for several weeks or months, but this is always completely recovered from in time. Up to the present there has been only one failure in a series of forty-three cases.

Angina Pectoris.—E. Fletcher Ingals and William R. Meeker (*Journal A. M. A.*, April 6, 1918) point out, in the course of a discussion of an extensive series of private cases, that the nitrites are among the most valuable remedies for true angina, but that they are not commonly used in sufficiently large doses. Anywhere from ten to twenty or more hundredths of a grain of nitroglycerin may be required in a day, and as many as 100 have been taken in a single day with very good effects. Often following the use of from five to ten hundredths in one day there will be freedom from attacks during the whole day following. These large doses are frequently needed, and no harm will come from increasing the doses if the way is carefully felt, and so long as they do not cause too much headache. For prompt action the drug should be taken by letting the tablet dissolve in the mouth or under the tongue. This often gives the full effects in one to three minutes, while swallowing the tablet may delay the action for ten minutes, and may greatly reduce its intensity. The drug should be reasonably fresh, and should be carried in a tightly stoppered, small bottle. The unpleasant odor is a disadvantage of amyl nitrite, as is the disposal of the glass from the pearls. Sodium nitrite may dis-

turb the stomach, and erythrol tetranitrate sometimes proves less effective than nitroglycerin. Atropin is useful to protect the heart against inhibition shock, and should be used more or less continuously for this purpose, the doses ranging up to 2.0 milligrams (3/100 grain). Iodides and arsenic are recommended, but often prove of little value. Morphine may be required in prolonged and severe attacks, but it often disturbs the digestion, and should never be used unless absolutely necessary. Digitalis and nux vomica should be used when the heart is feeble, and the results seem better when the two are given than from either one alone. The usual measures of rest, diet, avoidance of exciting causes, and use of baths should be invoked.

Eczema in Infancy.—F. P. Gengenbach (*Southern Medical Journal*, March, 1918) considers under the head of general treatment increased elimination from the bowels, kidneys and skin, proper nourishment, and the relief of reflex conditions. A thorough cleaning out of the gastrointestinal tract, with increased water intake, will frequently be sufficient to cause an immediate improvement in the eruption, and for this purpose he recommends a preliminary intestinal irrigation, then a course of calomel, followed by castor oil, milk of magnesia, or sodium phosphate. Under proper nourishment comes regulation of the diet, preferably after efforts have been made to discover the offending food elements by examination of the stools and food inoculations of the skin. In breast fed infants fat is practically always the offending element. The mother should take less of the fat producing foods, especially red meats, rich milk or cream, eggs, malt preparations and alcoholic beverages. She should drink more water and take more outdoor exercise. The nursing interval should be lengthened and the nursing time curtailed, so that the infant will get only the first part of the milk, which is lowest in fat. The rest should be pumped out to prevent caking of the breasts. If necessary, the infant should receive before nursing one half to one ounce of boiled water, or weak cereal water, to which has been added two to five grains of sodium citrate. If the infant is constipated it should be given milk of magnesia or sodium phosphate, while if the mother is constipated she should drink plenty of water and eat plenty of the subacid fruits, vegetables, bran preparations, and if necessary take some mild laxative.

The writer's practice is to give artificially fed infants boiled skimmed milk diluted with boiled water to which has been added sodium citrate. If sweetening is needed a small amount of saccharin is added. This places the infant upon a food low in fat and sugar, with the proteid so modified as to be easily digestible. Then the dilution is gradually decreased until the infant is taking boiled skimmed milk alone. This tests out the tolerance for proteid. At the same time orange juice is tried about half an hour before one or more feedings, the latter being given every three hours. If the skin manifestations have practically, if not wholly, cleared up, a gradually increasing amount of cream is added until if possible whole milk is given. Should this cause an aggravation the fat percentage is again reduced to

the point of tolerance, and maltose or dextrose is cautiously tried. If the infant has passed the first half year of life, vegetable broths with little or no meat stock are next tried, followed later by strained vegetables, the best of which are potatoes, carrots, spinach, turnips, and squash. Strained stewed fruits may be tried, especially if the child is constipated, as well as cereals, and puddings of gelatine, tapioca, corn starch, and custards, if no sensitization to eggs exists. In order to help the teeth through the baby is given zwieback, whole wheat sticks, or toasted whole wheat bread to chew. During the second year beef juice, scraped meat, or meat broths and eggs may be given, but these cases usually do better on practically a meat free diet and a sparing use of eggs. Thoroughly cooked rice, farina, and hominy grits usually agree well. If the digestion is good more stress is laid on the solid foods and less on milk. Whether the infant is artificially or breast fed, the normal food requirement must not be interfered with for a long time for the sake of curing the eczema. In poorly nourished infants tonics are often helpful.

Under local treatment special efforts should be made to protect the skin from irritating underwear, exposure to inclement weather, overheating, and irritating discharges. In acute cases moist applications are sometimes preferable to ointments, but may cause depression by chilling. One of the best is:

R Calamine (pink),	grs. lxxx;
Zinc oxide,	5iv;
Glycerine,	5j;
Aque calcaes,	q. s. ad 5viij.

When itching is marked, phenol may be added in the strength of one quarter to one per cent. In subacute and chronic cases the following ointment has served well:

Acid salicylic,	grs. viij;
Acid boric,	3ss;
Ung. zinci oxid,	3iv;
Phenolated vaseline,	q. s. ad 5j.

No soap should be used in washing the face, as even the most expensive are often irritating. Potato flour or fuller's earth is the best powder, if any is to be used.

Impetigo in Soldiers.—Henry MacCormac (*British Medical Journal*, February 2, 1918) is prompted by the very great prevalence of impetigo among the troops to describe the several types and indicate the most suitable methods of treatment for each. In true impetigo contagiosa the crusts should first be removed with forceps and by boric acid, or boric starch fomentations and poultices. It is often well to anoint the lesions with liquid petrolatum before this step. When the crusts are removed the lesions should be rubbed with zinc ointment containing one per cent. of ammoniated mercury, or if this is too irritating, the lesions may be washed with 1:1000 mercuric chloride and Lassar's paste be applied. In the bullous phase the bullæ should be opened, washed with the bichloride lotion, and dusted with ten per cent. boric acid in equal parts of starch and zinc oxide. In cases of ecthyma in the progressive phase the neighboring skin should be washed with 1:4000 bichloride of mercury and the lesions treated by repeated hot fomentations. The crusts must first be removed. When active progress

has stopped 1:1000 bichloride, or eusol should be applied and sluggish lesions should be painted with two per cent. silver nitrate in sweet spirits of niter. Later Lassar's paste or weak white precipitate ointment should be applied. For impetigo complicating seborrheic eczema, the latter condition should be treated by frequent application of the following mixture:

Calamine,	1.3 (grs. xx);
Zinc oxide,	1.0 (grs. xv);
Lime water,	8.0 (dr. ii);
Olive oil,	30.0 (oz. i).

This should be applied after the removal of the scabs, and, in hairy parts, shaving should precede the applications. Later this should be replaced by Lassar's paste containing two per cent. of salicylic acid or ichthylol, and chronic lesions should receive silver nitrate applications. This is then followed by the treatment already described for ecthyma.

Treatment of Prickly Heat.—Aldo Castellani

(*Journal of General Medicine and Hygiene*, December 1, 1917) advises that in this condition all the underclothing be changed at least once daily. The affected parts should be washed with a one in 1,000 solution of mercury bichloride or a two per cent. alcoholic solution of salicylic acid, followed by astringent and antiseptic powders, such as a mixture of ten grains of salicylic acid or thirty grains of boric acid with one ounce of talcum. Greasy applications are not, as a rule, well borne. For many years the author has used the following lotion with good results; in the East it is known as Castellani's lotion:

R. Acidi salicylici,	gr. ii-v;
Mentholis,	gr. x;
Mentholis,	gr. x;
Zinci oxidi,	5vi;
Calamine preparate (N. F.),	3i-iii;

M. Sig.: To be well shaken and daubed on the affected parts.

For application to the face, or when used in children, the lotion is diluted with an equal volume of water. It should not be employed when a true eczematous dermatitis has developed on prickly heat lesions, as is occasionally the case. In such instances, lead water, one to two drams, should be substituted for the menthol in the lotion, and the alcohol greatly decreased or omitted altogether.

Action of Acriflavine and Proflavine.—W. Parry

(*Medical Record*, March 11, 1918) studies both of these substances with reference to their influence in killing or inhibiting the multiplication of organisms in pus or tissues and with reference to their selective bactericidal actions and toxic properties to the tissues. He found acriflavine more active in both its antiseptic and toxic properties, and that it was very markedly selective in its action on streptococci and less so on staphylococci, while it was almost without effect on certain other organisms. Its toxic action on the tissues was marked but slow and was not such as to make its use inadvisable in solutions as dilute as about 1:4,000 specially in infections with streptococci and staphylococci. Its application should follow the thorough cleansing of the wound by washing with a rapidly acting antiseptic such as Dakin's solution, followed by normal saline.

War Surgery of the Chest.—A. L. Lockwood and J. A. Nixon (*British Medical Journal*, January 26, 1918) emphasize the fact that one of the greatest difficulties in treatment is the recognition of those cases which will recover without operation and those which will not. Immediate operation seems to be demanded in all chest wounds in which the diaphragm or abdomen is involved; where there are extensive injuries to the bony skeleton of the thorax; where there is a "sucking" wound; and whenever evidences of septic infection are present or develop. Other than such cases should be treated expectantly and immediate operation is not justified. A most important element in the treatment in all cases is the evacuation and early handling. Cases with traumatopnea should have their wounds carefully cleaned and sutured without anesthesia in the advanced dressing station. Evacuation to the surgical unit for chest cases should be as prompt and rapid as possible. On arrival, the patient should be dressed in clean pajamas; laid between warmed blankets in a heater in the most comfortable position, preferably with the injured side dependent; and continuous rectal administration of water containing five per cent. each of glucose and sodium bicarbonate should be instituted. If necessary two per cent. sodium bicarbonate solution should be given intravenously, or in very serious cases 600 to 800 mls of blood should be transfused. Hot drinks are given, but no stimulants are administered. Sleep is secured by quietude, darkness, and omnopon or morphine. Urgent dyspnea should be relieved by aspiration in hemothorax or pneumothorax cases; and if fresh hemorrhage is suspected this should be accompanied by partial oxygen replacement. When the condition permits, after such resuscitative measures, a most searching examination should be made to determine the precise nature of the injury and all foreign bodies should be carefully located with the x rays. If immediate operation is required the examination should be cut short when that fact has been determined and localization of foreign bodies completed. One must, of course, make sure that the patient's condition will permit of an operation being performed.

In a subsequent issue (February 2, 1918) the authors offered the following recommendations for operations in cases of chest wounds. An ampoule of omnoponscopolamine is given one hour before operation and half an ampoule is administered half an hour later if the patient is not sleeping. He is kept with his injured side dependent, usually in a half sitting position, throughout operation. The skin is cleansed with a three per cent. alcoholic solution of picric acid, paravertebral anesthesia is secured with half per cent. novocain and one quarter per cent. potassium sulphate in normal saline, to which epinephrine is added just prior to injection. Finally, local infiltration anesthesia is carried out at a short distance from the wound. Gas and oxygen should be kept ready for use at any time. The wound track is first freely excised, the instruments, rubber gloves, and draperies changed, the skin again painted with the picric acid, and the chest widely opened by resection of a portion of rib, the fourth if the wound permits. The pleural cavity is rapidly mopped out

with gauze wrung out of hot saline and hemorrhage, or lacerations of the diaphragm are first attended to. If there are accessible abdominal injuries these are repaired through the diaphragm. Missiles are removed from the liver, the track cleaned out with a Volkmann spoon, swabbed with saline and ether, and oozing checked by deep sutures. The diaphragm is next closed by suture and the intrathoracic lesions attacked. Missiles should be removed from the lung or lacerations excised and the lung sewed with a blunt, round needle. All fragments of missiles, cloth or bone must be sought and removed from the chest cavity and the cavity well cleaned with swabs wrung dry out of hot saline, and finally out of warmed ether. The chest should then be closed tightly by suture of the first layer of muscles and the skin then carefully sutured. A dressing of gauze is applied and can be coated with mastisol or aeroplane "dope" and a broad adhesive plaster band tied over the dressing. In some cases, specially with two large openings far apart, or laceration of both leaves of the diaphragm, the operation can be divided into two stages separated by about two hours, during which the patient is not disturbed or moved. Postoperative treatment is most important and includes the maintenance of a half recumbent position; inhalation of oxygen, passed through warm brandy, for cyanosis; the use of omnopon for restlessness; and the prevention of acidosis by the rectal administration of sodium bicarbonate and glucose in water, five per cent. of each, and oral administration of sodium bicarbonate, barley sugar and glucose. Nursing should be in the open air.

Surgical Treatment of Epididymitis.—Richard L. Cook (*Journal A. M. A.*, April 6, 1918) recommends the following surgical treatment for the relief of this common gonorrheal infection because of its prompt relief of the pain and rapid cure of the infection, as shown by the results obtained in 276 cases. The parts should be shaved and prepared by applying three successive coats of 3.5 per cent. iodine, each fanned dry to prevent blistering. A two inch incision is made high up and to the outer lateral aspect of the affected side, being carried through the skin only. The skin is dissected back for quarter of an inch to give room for mattress sutures. The dartos and cremasteric muscle and fascia are incised down to the parietal layer of the tunica vaginalis, and the edges are caught in clamps. Adhesions to the tunica are broken with the finger, and the testicle is shelled out in the tunica. The cavity of the dartos is packed to control oozing, and the old bottle operation is performed. The globus minor is punctured in several places with a cataract knife, and, if pus appears, a drain is inserted after the opening has been enlarged by forceps. The drain is a small tube of rubber tissue. The testicle is replaced, the gauze packing removed, and the dartos and cremasteric layer is closed with a continuous suture of plain gut. The drain is brought out of the upper angle of the wound, and the skin closed with a mattress suture of silkworm gut, pulled tight. The drain is removed in forty-eight to seventy-two hours, and the sutures in six or seven days.

Miscellany from Home and Foreign Journals

Dreams and Their Interpretation.—Robert Armstrong Jones (*American Journal of Insanity*, April, 1918) gives a short history of the study of dreams, saying they differ from conscious processes in that there is a dissociation of the mental factors: the will remains in abeyance, the cognitive elements are present and feeling may or may not be present. The truth in regard to their meaning probably lies somewhere between the elaborate conjectures of the psychoanalysts and the heedless attitude of those who dismiss them as a meaningless jargon. Several prophetic dreams are cited, but dismissed as explicable by the laws of coincidence.

The symbolical beliefs of savages are today reviewed and sexual meanings erroneously read into the symbols. The theory that sleep is the result of either the retraction or prolongation of dendrites is recounted and an analogy attempted between the resulting abeyance of motor functions and conscious processes. Sixty per cent. of dreams relate to sight, five per cent. to hearing, three per cent. to taste, and only one and one half per cent. to smell.

Infections of the Urinary Tract in Infants and Young Children.—Charles A. Sellers (*Journal of the Indiana State Medical Association*, March 15, 1918) claims that acute pyelocystitis is being overlooked in infancy because of the neglect of a routine microscopic urinary examination in all cases. While the condition is more frequent in female children, there are many cases in males which have been overlooked. The theory that acute pyelitis is always an ascending infection with the colon bacilli from the soiling of the vulva, is losing its hold. The blood stream infection route is the more probable. We are justified in believing that there is some other cause in which either the kidney resistance is below par, or there are conditions in the body fluids that increase the virulence of the colon bacillus. Acute pyelitis is probably never primary. The disease, as a rule, responds promptly to the alkaline treatment, especially potassium citrate or guaiacol, through rendering the urine alkaline. Urotropine and vaccines are most disappointing, and their use in young infants is not advocated.

Metastatic Cancer of the Bone Marrow without Erythroblastic Reaction.—W. R. Jack and J. H. Teacher (*Glasgow Medical Journal*, February, 1918), refers to the fact that some cases of gastric cancer closely simulate pernicious anemia in general symptomatology. Blood examination has been held valuable where metastatic cancer of bone or bone marrow is suspected. In contrast with true pernicious anemia, the anemia accompanying cancer is usually chlorotic in type, with low color index and without erythroblasts. Harrington, Teacher, and Kennedy had recently shown that upon the advent of bony metastases, the blood picture may so change as closely to reproduce the condition in pernicious anemia. Bone pains and an anemia with high color index and myelemia in any case of carcinoma had been held by Harrington and Teacher to suggest the diagnosis of cancer of the bone marrow. The au-

thors now report a case, similar to one recorded by Middleton, in which there were secondary tumors in the bone marrow, implicating a considerable number of bones, and yet in which the blood presented none of the characters of pernicious anemia. To explain the discrepancy the authors note that in these two cases the involvement might be called massive only in the sternum and one or two ribs, in other bones forming merely isolated nodules, while in the former cases tumor tissue was abundant in most of the bones invaded. An alternative explanation is that in the two cases without pernicious anemia, cancerous toxemia was such as to lead to an aplastic type of anemia and prevent an erythroblastic reaction in the bone marrow. The chief conclusion is that the pernicious anemia blood picture is not a necessary accompaniment of metastatic bone marrow cancer; a diagnosis of the latter may be justifiably made from the bone pains alone where the anemia is purely chlorotic in type.

Use of Tuberculin in the Diagnosis of Eye Lesions.—Charles Pirquet (*Archives d'Ophtalmologie*, October, 1917) notes that many eye lesions formerly diagnosed as idiopathic are in reality tuberculous.

Careful diagnosticians have, moreover, been chagrined at the clinically tuberculous lesions showing a strongly positive Wassermann reaction and yielding to antisiphilitic treatment, as well as at lesions apparently specific but which are uninfluenced by antituberc measures, and later show a focal reaction following a tuberculin test. The tuberculin ophthalmic reaction is unsafe, the Von Pirquet cutaneous reaction inconclusive. The diagnostic test of real value to the ophthalmologist is the focal reaction following subcutaneous injection of old tuberculin. A positive general reaction without focal reaction signifies probably a tuberculous lesion in some location other than the eye. The focal reaction, if the lesion is corneal, consists in an increase in the circumcorneal injection with an extension of infiltration into the cornea. The disturbance may be merely slight. If the case is iritic, there is increased circumcorneal injection with more numerous deposits on Descemet's membrane and some increase in cloudiness of the aqueous. If it is choroidal or retinal, there is increased edema and cloudiness of the vitreous, possibly with fresh hemorrhages if the vessels are chiefly affected. In corneal lesions, a large diagnostic dose, one to ten milligrams, can be used; the former is usually sufficient. In acute iritis 0.5 milligram is appropriate; in more chronic iritis, up to five milligrams. In very acute choroidal or retinal lesions, especially when near the macula, the eye should be put at rest till the condition is sub-acute or chronic, and even then only an exceedingly small dose used. In neglected cases with the tissues so cloudy that exact observation of the acuteness of the condition is impossible and where all other possible sources of etiological factors prove negative, one should begin with very minute therapeutic doses, such as 1:500,000 milligram of T. O., and gradually increase until some focal reaction or some improvement in the condition is noted.

The Lacha Marzo Sign in the Diagnosis of Death.—R. Alvarez de Toledo y Valero (*La Cronica Medica, Lima*, January, 1918) from observations made on 180 dead and two thousand living subjects finds that this test is a certain sign of real death; that it is never found in life; that it is not constantly present; that it occurs usually from one half to seven and a half hours after death; and that low atmospheric temperature may impair its action. The sign is an acidity of the secretion of the conjunctival sac as shown by its reaction on tornasol paper.

Radical Mastoid Operation in Chronic Suppurative Otitis.—W. D. Black (*Journal of the Missouri State Medical Association*, April, 1918) divides indications for the radical mastoid operation into two classes; immediate and deferred operation. Immediate operation is indicated in dangerous complications such as otitis, brain abscess, epidural abscess, cerebellar abscess, thrombosis of the lateral sinus, extensive cholesteatoma, beginning symptoms of meningitis of otitis origin, sudden facial paralysis or labyrinthine involvement.

Deferred operation is done in chronic suppuration where, after three months, medical treatment combined with surgery through the external canal has failed. Further, progressively decreasing hearing and persistent discharge regardless of treatment call for the radical operation; again, if pain occurs within the ear or over the side of the head in an otherwise quiet suppurating ear even if the canal is patulous and the perforation large and clean, the radical operation is indicated.

Psychoanalytic Tendencies.—William W. White (*American Journal of Insanity*, April, 1918) tells us that Freud has now abandoned the theory of sexual trauma in infancy in favor of the incest complex as the root complex in all neuroses. It is a measure of the progress of the individual along the developmental path and with the discovery of this we go far toward solving the problem of the neurotic or the psychotic. To deal with such problems there has arisen an energetic concept of psychic force—the libido—and keeping it in mind we are prepared to attack problems of maladjustment, failure to integrate, etc. Adler has gone away from the purely psychological viewpoint and shown us that the neurotic's symptoms are expressions of his attempt to compensate for organ inferiority. In all departments of knowledge we may see analogous process: in physiology, the conditioned reflexes of Pawlow; in philosophy, the dynamic concept of Bergson; in philology, theology, mythology, etc. Thus psychoanalysis forms a common denominator for the progress of knowledge of mankind, never as bad as the realist paints, rarely as good as the idealist fancies, but "human, all too human," with hopes and fears, struggles, successes and failure. This can be illustrated by the modern attitude toward the alcohol problem, it is not a therapeutic or an economic problem primarily, but a psychological one. Why does the individual use alcohol? That learned, we can attack the problem with some degree of hope. Furthermore, by the aid of psychoanalysis, we are beginning to understand our mental patients and actually do something for them.

Late Results of Testicle Implantation.—G. Frank Lydston (*Journal A. M. A.*, March 30, 1918) presents the records of two of his cases of bilateral testicle implantation, the one having been done in August, 1915, the other in October, 1916. In both patients there has been a return of the absent sexual functions, removal of most of the secondary female sex characters and acquisition of the secondary male characters, and other evidences of a permanent restoration of the testicular hormones.

Tuberculosis of the Cecum.—John W. Sluss (*Journal of the Indiana State Medical Association*, March 15, 1918) thus summarizes the points in his paper: Tuberculosis of the cecum is practically a primary affection. In its earlier stages it may be diagnosed as acute appendicitis or tubercular peritonitis, in its later stages as appendicitis with inflammatory exudates or abscess formation, in its terminal as carcinoma. The pathology is constituted by ulceration of the mucosa, hyperplasia of all the layers and especially the peritoneal covering, and terminal cicatrization with stenosis. The tumor mass is not usually adherent. Excision offers an excellent prognosis if not undertaken too late; before metastasis is general and before obstruction supervenes.

X Ray Diagnosis of Pulmonary Tuberculosis.

—H. Lebon (*Presse médicale*, February 14, 1918) pleads for the utilization of all procedures calculated to assist in the early diagnosis of the disease rather than a too exclusive reliance on x ray examination. Doubt is not always removed even by painstaking radioscapy. On the other hand, contrasting conditions in adjoining sections of lung tissue, only with difficulty perceptible through auscultation and percussion, can be at once made out on the screen. Opacities due to circumscribed but advanced lesions are very precisely revealed. A simple diminution from the normal transparency of the apices is harder to detect under the x rays than are circumscribed lesions, and in this direction the x ray examination is subject to almost as many causes of error as are percussion and auscultation. Discrete lesions in the apices may not be revealed by the rays, even though already causing a diminution of the vesicular murmur on auscultation. There is as yet no general agreement as to whether radioscapy will reveal an apical shadow before the expiratory breath sounds are at all modified. The author is inclined to believe that in the presence of an apical shadow positive auscultatory signs can always be made out. Tubercle bacilli can sometimes be found in the sputum where there is only a slight apical x ray shadow; this is due to perforation of bronchial channels by a small submiliary focus. Again, an abnormal shadow at the apex may result from an old tuberculous focus or an old apical pleuritis. Slight diminution of clearness at both apices, whether noted by radioscapy or radiography, does not, in the absence of auscultatory signs, warrant a diagnosis of lung tuberculosis. Slight diminution of clearness at one apex is of much greater significance, but still does alone warrant a positive diagnosis. The probability of an apical tuberculosis does not approach certainty unless the findings of percussion, auscultation and radioscapy are in agreement.

Proceedings of National and Local Societies

THE MEDICAL ASSOCIATION OF THE GREATER CITY OF NEW YORK.

Stated Meeting, Held October 15, 1917.

The Problem of the Feeble-minded and Epileptics.—A paper was read by Dr. W. FERNALD CORNELL, which will shortly appear in the *New York Medical Journal*.

Dr. THOMAS H. SOUTHWORTH opened the discussion by saying that this problem has in recent years received much attention, not only from educators, but from all interested in the welfare and morality of the community. As the result of this agitation it had been found wise to segregate large numbers of unfortunates hitherto attending our public schools and who had been detrimental to their fellow scholars; also to segregate a still larger number who were detrimental to the community at large. A further problem had arisen of providing a more humane environment; one where, with their limited capacities, they might be developed along lines which would contribute to their helpfulness and happiness. To this problem the City of New York has devoted itself, and they were gathered today to learn what was being done.

Hon. HENRY C. WRIGHT (First Deputy Commissioner of Charities) expressed his pleasure in having the association meet at the New York City Children's Hospital and Schools. Four years ago, that institution was primarily a custodial institution, but it was now unique in the United States, and perhaps in the world, in that it received defective minded children from a public of six million people, studied them, grouped them, and sent them on according to this grouping, to state institutions, who devote themselves to the care of those sent, the first institution acting like a sieve. A certain number are retained, while others are sent to the state institutions at Letchworth Village, Rome, Syracuse, Craig Colony, etc. That, in a certain sense, made the Randall's Island institution a trying out place or laboratory in quite a different sense from other institutions for the feeble minded.

First, it is determined whether the defective mind was due to traumatism, pressure on the brain, dislocation of the vertebra causing pressure on the nerves, defective internal secretions, autointoxication of any kind, then studied from the mental standpoint, to determine the grade. It was then determined whether the patient should go to one of the state institutions or be retained and trained to become a useful member of the community or of an institution. Doctor Fernald, of the Massachusetts School for Feeble-minded, had shown us a better way, and demonstrated it possible to take a low grade idiot and by beginning early enough to so train the correlation of his actions and motions that he might become a useful member of the institution or perhaps of some other establishment where training could be kept up. In visiting Doctor Fernald's institution, he was shown a number of little idiots picking up stones and throwing them into a hole. That seemed very simple, but some of

these children could not do it, although the hole was six or eight feet in diameter; but, by continuing this simple training, later he was able to take these children to a farm where they could pick up stones scattered around and carry them to a pile and deposit them there, so clearing the ground and making themselves useful. Here they were now starting on a much larger programme. First, the diagnosis, and then this training, so that those who must be custodians for the remainder of their lives would be helpful. First they had to get rid of the old rat traps of buildings in which these cases were housed. Then they were divided roughly into two groups—those who could not help themselves, and those who could. Those who required attention to their personal wants were put in the infirmary, the others in cottages—girls on one side of the island and boys on the other. The more useful part of all this is the classifying, i. e., giving the requisite training to those capable of receiving it. They wished to give every possible facility to the medical profession, and invited their cooperation. They wanted the psychiatrists, psychologists, neurologists, etc., to come and study those cases and get whatever benefit can be derived from studying them. They were also trying to do that work in their hospitals, and in Brooklyn one of the hospitals held clinics, which were attended by students and physicians, and was developing much interest.

Dr. FRANKWOOD E. WILLIAMS (Associated Medical Director of the National Committee for Mental Hygiene) said that the cases shown by Doctor Cornell were most interesting. The first work for the feeble-minded in this country was undertaken by Samuel Howe, of Boston, whose work was with the low grade feeble-minded, the idiots, and his interest was largely humanitarian. Up to that time the feeble-minded had been cared for mainly in local poor-houses, where they were neglected, frequently abused, and in consequence, deteriorated. It was Howe's aim to show that even idiots could be kept from becoming degraded, and he proved his point. The present countrywide interest in the subject of feeble-mindedness was not so much humanitarian as social, economic, practical. Since Doctor Howe's time it has been learned that there are different grades of feeble-mindedness; that, socially, the lower grades the idiots, are not of particular importance, but the higher grade feeble-minded produce many difficult social problems. The community has found that for its own self protection it must understand and care for this group, and, as it cannot be assimilated by the community, it must be dealt with in a more special way. The plan outlined by Commissioner Wright is now being generally adopted throughout the country.

In the ungraded classes of the public schools certain of the higher grades could be taught simple trades, so that, under supervision, they could do fairly well in the community, and need never come to institutions. Those children who had passed through the ungraded classes and could not take care of themselves, even under careful supervision,

should be sent to institutions where their training could be continued and they could be made largely self supporting in a more simplified environment, such as is found in specially provided colonies. Where the number of such children was so great that they could not be properly cared for in the ungraded schools, then they should be sent to a clearing house, such as that planned for the Randall Island Hospital, and, if the plans for this institution could be carried out, New York City would be provided with one of the best institutions and systems in the United States. Intelligent supervision, however, was the keystone of their success. If such children were simply discharged unsupervised into the community, as unhappily was being done from many special classes throughout the country, if they were simply trained to a certain point and then dumped on the community and left to drift, they will soon become a thorn in the community flesh. Steps had been taken by the State to do this, and Doctor Carlyle was now developing an organization in the State Department of Charities for the work. With such a plan for New York City, carried out in cooperation with the state, control of the problem of feeble-mindedness could eventually be obtained.

The Care and Treatment of Epileptics.—Dr. L. PIERCE CLARK read a paper on the subject.

Dr. CLARENCE O. CHENEY said that he thought too much credit could not be given to Doctor Clark for his very instructive studies of epilepsy, a disease which might be considered one of nature's experiments; many previous investigations of it have been made, but have not led to much, probably because the experiment was considered to be in the nature of a simple formula, namely, that if to an individual some toxin or digestive or glandular disorder were added, epilepsy would be the result. Some simple explanation for epilepsy was looked for and the broad reactions of the individual were not given much consideration. Doctor Clark had made a quantitative and qualitative analysis of the experiment and has shown that many factors enter into it. The analysis by him of the personality of the epileptic had shown that there is an inherent defect of adaptability. He had further shown that, added to this in the production of epilepsy, were stress and strain which cannot be taken care of by the individual because of his defect. The more marked the adaptive defect the smaller would be the stress necessary to result in epilepsy, whereas individuals with slight defect might go through life without reacting to stress and strain in frank epilepsy. Doctor Clark considered the epileptic attack was to the epileptic a means of avoiding or withdrawing from reality. To those who saw in essential epilepsy many organic factors, that explanation of the mechanism of the attack might not seem adequate, but it would probably be a long time before we could know definitely what goes on in the central nervous system during an attack; and any hypothesis was valuable in proportion as it brought about therapeutic results. He had taken epileptics and, by a complete investigation of the personality and the individual capabilities, had brought about by means of careful detailed supervision a definite arrest of epileptic manifestations and made these people serviceable members of the community.

Stated Meeting, Held November 19, 1917.

Prevention of Hydrophobia.—A paper on the subject was read by Doctor Abramson, which will shortly appear in the NEW YORK MEDICAL JOURNAL.

Dr. WILLIAM LAING SOMERSET in opening the discussion said in discussing rabies Doctor Abramson had not mentioned one very important symptom, *i. e.*, the change in the patient's voice—the hoarse croaking voice. The one drug that was effective in relieving the condition was a sufficient quantity of hyosine hydrobromate.

Doctor SOUTHWORTH said that it would be helpful if Doctor Silkman and Doctor Abramson would state the approximate length of time that a dog must be under observation to be sure that it was not rabid.

Dr. A. SILKMAN said a dog should be kept under observation at least seven days. Doctor Abramson had covered the subject so thoroughly, that little could be added. He had understood him to say that dogs are required to be kept muzzled in the house, but thought this was a mistake; they were required to be kept muzzled in the streets and in public places, this includes halls in tenement houses. Also, the charts evidently referred only to the Borough of Manhattan, and the number of dogs there. In Greater New York last year there were 3,247 dog bites reported; and there were only twenty-four rabid dogs and one death from human rabies. In 1912, there were 4,192 cases of bites; in 1913, 4,366; in 1914, 4,462; in 1915, 3,640; in 1916, 3,247—showing that there is a decline in the number of bites.

Doctor ABRAMSON, replying to Doctor Duerman's inquiry, said that it was a case of short incubation. The time consumed by treatment was twenty-one days; and the child developed rabies fifteen days after the beginning of the course. As to the modification of the clinical symptoms of rabies, it simply meant that a partial immunity was produced by the course of injections. This particular child was very hungry and very thirsty, and was able to drink ravenously and to get food down with some difficulty. In cases where they had no previous anti-treatment, an inability to swallow was observed from the first. As to the hoarse voice, Doctor Somerset's experience was greater than his own. As he recalled it, the last case he saw did have a hoarse voice. Replying to Doctor Southworth's inquiry, he said that a dog was kept under observation for a period of ten days from the time of the bite. If the animal was well at the end of that time, it did not have rabies at the time the bite was inflicted.

Diagnostic Kinks in Infectious Diseases.—A paper on the subject was read by Doctor Hubbard and will shortly be published in the NEW YORK MEDICAL JOURNAL.

Dr. WILLIAM LAING SOMERSET, referring to Doctor Hubbard's paper, said a large proportion of the errors made in the diagnosis of the exanthemata occurred on the side of safety. The best preparation a man could have was to equip himself with a definite notion of each one of the exanthemata and its limits. There might be either surface invasion, local infection, or disease.

The diagnosis of any of the exanthemata may not safely be made without a skin eruption. As soon as any one undertakes to do that, he will be drowned or worse. Another definite statement safe to make is that whatever the length of time one of these eruptions takes to arrive at its culmination—whether one day as in the case of German measles, or eight to twelve, as in smallpox—it will be a greater number of days before the rash disappears. As to the order in which these symptoms appear, that also is strictly limited in each of these diseases.

Dr. JOHN RANDOLPH GRAHAM said in his experience a great many errors of diagnosis in eruptive diseases were the result of taking too much for granted. One should always bear in mind the fact that for every eruptive contagious disease there was a noncontagious rash that will simulate it. As an example of the casual way in which some men approach this subject, Doctor Graham said that in the last year he had seen two cases reported as typhus fever which were found on investigation to be pure and unadulterated measles.

Another problem which he had encountered in this work was very annoying, *i. e.*, the change in the type of cases of scarlet fever. Within the last ten years the character of this disease has become greatly modified, so that hardly one case in ten or twenty was as severe as a decade ago. In a newly discovered desquamating case the mother will often state that two or three weeks before the patient had a little sore throat and fever for a day or two and that she had noticed no rash—which does not mean, that there was no rash. If a case is kept under observation three weeks at the outside, desquamation and hands and feet will confirm the diagnosis.

Doctor SOMERSET, replying to Doctor Hermann, said that there is no "fourth disease" recognized by the department, unless that term is used as a synonym for German measles. In regard to the pathognomonic nature of the desquamation of scarlet fever, he would go so far as to say that without any history of eruption or without any other corroboration whatever, it would be impossible to make a positive diagnosis of scarlet fever from desquamation of the skin. The desquamation is corroborative evidence merely, it is not positive proof. One cannot safely go further than that without getting into trouble.

Dr. CHARLES HERMANN, referring to the question of the exanthemata, asked whether the health department recognized a "fourth disease." Did they consider it a mild form of scarlet fever? Did they know of any children who were supposed to have a mild form of scarlet fever, who were sent to the hospital and there contracted the true disease? Did the Board of Health consider desquamation as pathognomonic of scarlet fever? He himself did not so consider it.

Dr. R. H. ROSE asked if it were not possible to have a rash due to intestinal conditions, with considerable fever, simulating well marked scarlet fever. Some years ago he had a case thought to be scarlet fever, the temperature between 102 and 103 for several days. He understood that the same patient, who now lives in another city, had had the desquamation several times since. Each time these attacks had been accompanied by fever and prostration and

the desquamation had been marked each time. She had a very bad case of intestinal stasis. Was the desquamation not due to intestinal stasis? Exercise and control of the bowels had been the effective remedies.

Dr. MAX SHEER considered that the eruption and desquamation in erythema scarlatiniforme may bear a close resemblance to that of scarlet fever. The former was an affection produced by some toxine and frequently ushered in with fever and a red throat, followed immediately, or in a day or two, by an eruption which might exactly resemble scarlet fever. Desquamation, which might be fine, or abundant and in large flakes, began in a few days.

Dr. S. D. HUBBARD, replying to the comment made regarding erythema scarlatiniforme, said that both Fox and Jackson of the Columbia University (Vanderbilt Clinic) hesitated regarding this diagnosis when it presented itself, especially in children and in the initial attack.

He had called on a little girl about ten years old, presenting a typical history of scarlet, with sequential symptoms followed by desquamation which had occurred in September. She had a recurrence at Christmas of the same year. This case had been seen by several of the diagnosticians of the Department of Health who, in the first attack, concluded it scarlet fever, but, on the recurrence, revised their diagnosis. It is also interesting that, following each attack, albumen presented itself in the urine. Recovery was complete and without any sequelæ. There had been no recurrence for eleven years.

The "sore throat" of exfoliating dermatitis was occasionally present, but was not the character of throat seen in scarlet, in that there was but little if any congestion, but there was pain on taking food. He had followed very carefully five of these recurring exfoliating erythemas, and, in each instance, the initial attack was mistaken for scarlet. The desquamation did not have the tiny bull's eye desquamation of scarlet; the latter as the only condition observed by him which had that peculiarity: commenced to desquamate in the site of the little puncta, started as a fine pin hole elevation of the cellular structure, apparently the cone of the puncta, and spread peripherally, coalescing with others forming a sheet or scale.

In regard to the fourth disease, Doctor Hubbard said that some years ago, he had made a very careful study of German measles, while acting as a diagnostician for the New York City Department of Health, particularly its modified forms and allied clinical symptoms. The president, Doctor Southworth, had seen some of these cases with him. That year there was quite an epidemic of German measles throughout New York City but particularly in the Borough of the Bronx, and so far as his experience went he was not inclined to acknowledge the existence of a fourth disease. The modified form of German measles was frequently very atypical and irregular, but with its peculiar spotted throat (Forscheimer's spots) and its chain of beads (enlarged glands) on each side of the neck; with a rash of very short duration, with invariable recovery of patient, would make the diagnosis. The rash of German measles did have a dual character, at times

closely simulating measles, and, at other times, scarlet. In cases simulating measles, the rash was not that peculiar rich reddish mulberry purple seen in genuine measles, and seen in daylight, the absence of this peculiar coloring should determine the diagnosis. The sore throat consisted of an isolated patch of small spots, located about the junction of the hard and soft palate, and usually only on one side or near mid line, described for the first time by Forscheimer and bears his name.

Recent Work in Immunization against Colds.
—This paper by Dr. JAMES G. DWYER, appears on page 885 of this issue of the NEW YORK MEDICAL JOURNAL.

Dr. LEWIS A. COFFIN in opening the discussion said he was glad to hear Doctor Dwyer own he was still in doubt as to the value of this treatment. He was working on the border line between the known and the unknown, and it is probably because of that that he was so keen and happy in his work. One tingle as he now and again got a glimpse beyond the already known. Coffin said that he had been for years associated with Doctor Dwyer through their hospital connection and that he had come to have great confidence in his judgment. Doctor Dwyer had opened his paper by saying that one might take either a negative or positive side. That was altogether true. The fact that one could give case histories which would seem to prove there was nothing in the immunization theory, lost weight when we knew that as many, if not more, could be quoted which seem to prove that positive good had resulted.

He was pleased to hear Doctor Dwyer speak of the condition of the intestinal tract as a predisposing cause in inducing changes in the vasomotor system of the nose. They probably all knew this, but did not always put their knowledge to practical use. We are more liable to treat symptoms. It was possible that one may immunize against or colds prevented. If the bowels be kept open and free of putrefying processes, there would be no fit place for the germ to work.

Doctor Coffin cited several cases that had, as far as he could judge, been markedly benefited by the use of the immunization process as described.

Doctor MACKENTY remarked that after a first experience in the use of vaccines for colds he had given them up, the results being negligible; but under the uniform work that Doctor Dwyer has been doing during the last few years, he had changed his mind on the subject, and had used them with considerable benefit. As Doctor Coffin had said, there is no question that intestinal conditions often determine colds in the head, and the use of vaccines solely, without paying attention to the condition of the intestinal tract, was the cause of many of the failures. The work which Doctor Connellan had been doing in investigating colonic conditions would probably make a big change in the conception of these infectious colds.

Much depended on the vaccines which are used and upon the care and judgment of the pathologist making them.

He had been much interested in the low grade toxic conditions which show little definite evidence,

except that on a careful examination one would sometimes discover a low grade of sinusitis. These cases have shown considerable benefit from vaccines, but not unless used with surgical drainage; it was important that the man who took the vaccine should take the culture. It was well to have the culture taken during an accurate exacerbation of the chronic trouble. It was an interesting fact that we would sometimes find one type of infection in one side of the nose and another in the other; these two conditions remaining constant, and would seem to prove that there is a sinus condition on the side of the more virulent infection. He had used cultures prior to operations on sinus conditions, in order to determine the bacterial flora present; and had used vaccines before and after operations hoping to raise the patient's resistance and shorten the period of convalescence.

Dr. WALTER L. NILES said his experience coincided completely with that of Doctor Dwyer. A great many influenza cultures are missed because of improper media. Cultures from the respiratory tract should always be taken on hemoglobin—containing media as well as other forms. Working in the Cornell Medical College Laboratory with Doctor Hastings he found there was a striking seasonal incidence of the various infecting organisms—some years one organism predominating. When, however, cultures were taken from the same person in succeeding years, the same organism was almost invariably found, showing that a person's cold was almost always produced by the same type of organism. It was, therefore, perfectly rational to attempt immunization against that infection, but the vaccine should always be autogenous. He had had no experience in adding other types of vaccines to an autogenous vaccine, but was not impressed by the desirability of so doing.

Dr. J. J. KING remarked that the preceding speakers had not mentioned body fatigue as a predisposing factor in colds. A number of patients in whom he thought he had produced immunity by vaccines, become reinfected by reason of body fatigue: he would therefore emphasize that point.

Doctor MABBOTT told of a patient who had been subject to attacks of asthma and had been much interested in the case of a friend with similar trouble who claimed to have been much benefited by three inoculations of Sherman's vaccine, No. 40. To him a remedy with a number suggested homeopathy. Homeopathy had produced a great deal of smoke, but the same could be said of Christian Science. However, he did believe in the effect of microbes of various kinds as a predisposing cause, and finally, perhaps, as exciting causes of certain kinds of colds. Nevertheless, he wished to protest against the assumption that the good old fashioned idea of a cold was to be eliminated from among our usual ailments. One of the speakers had said he had been using a vaccine for the past two weeks, yet during most of the time he had been speaking he seemed to be suffering from a bad cold. Doctor Mabbott said he himself was suffering from a slight cold, and was satisfied it was due to exposure to cold. He believed colds were due to reflexes, and if you could break them up within thirty-six hours it was done

by restoring the circulation. He doubted that a patient could be immunized to such an extent that he would not have some reflexes and some disturbance from direct exposure to cold and draughts.

Dr. WALTER L. NILES said that Doctor King had spoken of one important point in the causation of colds, *i. e.*, fatigue. One condition that always followed a cold is loss of weight. After an attack of gripe one loses ten or twenty pounds. The best way to counteract that was to eat well, which immunized against the next cold.

Letters to the Editors.

PRIORITY IN THE USE OF CROTALIN.

GREEN FAIR, April 24, 1918.

To the Editors:

In the interest of medical history, and with no desire to enter into a controversy as to priority of claims as to the employment of crotalin hypodermically in man, I desire to state that the late A. O. Ameden, M. D., of this city, used crotalin in this way for a case of tetanus in, or about, the year 1885. I make this statement from personal knowledge, having been a consultant in the case. The crotalin, aside from mitigating the severity of the spasms, had no perceptible effect upon the progress of the disease. The case had a fatal termination.

Very truly yours,

FREDERICK B. STREETER.

A NARCOTIC DRUG COMMISSIONER.

NEW YORK, April 30, 1918.

To the Editors:

I made an address before the Governor of New York at the reading of the Bill for a Narcotic Drug Commissioner, there representing the Federation of Medical Economic Leagues; the American Society for the Study of Alcohol and Other Narcotics; the Association for Medical Defence, and the Bronx County Medical Society, giving our objections as follows:

"We object to this law because it destroys the obligation of professional secrecy between patient and physician, in common with that of counsel and priest. It limits the discretion of administering opium beyond what is considered a reasonable quantity by a lay commissioner, or of dispensing more than two grains of morphine except under regulations irksome if not impossible of observance. It permits the possibility of a revocation of the license granted by the state to the physician for an offense committed by him which if committed by a lay peddler of drugs is only punishable as a misdemeanor. It permits the commissioner to make rules and regulations under a complicated system impossible of observance by the physician in active practice, which shall have all the force and effect of statute until modified or rescinded. It permits the commitment on application to a magistrate of any one using opium not under the direct care of a physician. There are many such persons, normal in other respects, who have to use opium. They could be proceeded against by interested parties from motives of a questionable character. It would make the plea of drug addiction an excuse for those accused of crime, as under this plea, they would obtain privileges of treatment which act as a stay of proceedings pending the trial of their cases. There was no reason for including cocaine in this law. The present cocaine law makes the illegal sale of this drug a felony. It has worked well, as it was drawn up by physicians, druggists, and manufacturers, without the interference of the criminal authorities. This penalty is now reduced to a misdemeanor in common with the unlawful sale of opium. We object because, according to the published statement of an assistant district attorney of New York city, this bill is the work of the New York State magistrates, and the New

York committee on the drug evil, the bench, the bar, and the prosecuting attorney of New York City. According to the same authority it was pronounced by a late member of the Narcotic Squad of the Police Department "a measure that was destined to establish the most perfect system for the control of narcotics that could be conceived."

I might also state that the Medical World is included in this category. Speaking as one of those who appear before the commission as a medical witness, I beg to be excused from any responsibility for this measure, when those I represent heartily and emphatically denounce as revolutionary, unconstitutional, and inimical to the welfare of those to whom we minister in the discharge of our obligation as physicians.

JOHN P. DAVIN, M. D.

Book Reviews.

[The Editors do not hold themselves responsible for the views expressed, nor do they assume any obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

Human Physiology. By Professor LUIGI LUCIANI, Director of the Physiological Institute of the Royal University of Rome. Translated by FRANCES A. WILBY. With a Preface by J. N. LANGLEY, F. R. S., Professor of Physiology in the University of Cambridge. In Five Volumes. Volume IV. The Sense Organs. Edited by Gordon M. Holmes, M. D. London: Macmillan and Co., Limited, 1917. Pp. x-519. (Price, \$5.25.)

We have had occasion to review previous numbers of Luciani's *Human Physiology*. The present volume, IV, dealing with the sense organs, has been edited by Dr. Gordon Holmes, of London, whose work in neurology has been followed with much interest by American scholars, particularly those who had the opportunity of meeting Dr. Holmes at the extension course in neurology given at the Fordham University some years ago. The author takes up in turn cutaneous sensibility, sensibility of the internal organs, taste, smell, hearing, eye mechanisms, retinal stimulation, ocular movements, and psychophysical phenomena. Luciani's physiology is recognized to be of value as a text for students, and the present volume follows the excellent standards set by the earlier ones. It is one of the most valuable of those which have appeared, dealing as it does more particularly with the physiology of the exteroceptors. The general practitioner will be greatly interested in the chapter on psychophysical phenomena, although it smacks a great deal of the old-fashioned brand of Aristotelian psychology.

Manual of Massage. By JAMES I. NELL, M. A., M. D., B. C. (Cantab), etc. Medical Officer Physiotherapeutic Department, St. Thomas's Hospital; Civilian Medical Officer in Charge of the Massage Department, Military Orthopedic Hospital, Shepherd's Bush. With an Introduction by Sir ROBERT JONES, C. B., F. R. C. S., Colonel, R. A. M. C., Inspector of Military Orthopedic Hospitals. Philadelphia: P. Blakiston's Son & Co., 1917. Pp. xvi-359. (Price \$3.)

This commendable volume is written with the object of pointing out, particularly to masseurs and masseuses, what is considered to be the rationale of massage treatment, and to endeavor to introduce into their technique the care and gentleness which will most speedily yield a successful result.

It is not a text-book for the student, but rather as a guide for the professional instructors. In this volume are discussed general principles of massage treatment, the various movements of massage, mobilization, apparatus for exercise, the treatment of recent injury by mobilization and massage, and a systematic massage for disorders of the various systems of the body. The book is profusely illustrated with carefully selected photographs. There is a very valuable chapter on massage treatment as related to war surgery, shell shock, also apparatus shown particularly adapted to the convalescent soldier. The book has an added value because of its association with the notable work of Col. Robert Jones.

Fractures of the Lower Extremity or Base of the Radius.

By LEWIS STEPHEN PILCHER, A. M., M. D., LL. D., of Brooklyn, N. Y., Consulting Surgeon, Bushwick, German, Jewish, St. John's, and Bethany Deaconess Hospitals, Norwegian Deaconess Home and Hospital, New York Skin and Cancer Hospital, Editor of the Annals of Surgery. One hundred and thirty-two illustrations. Philadelphia: J. B. Lippincott Company, 1917. Pp. 116.

This valuable monograph, the fruit of many years of observation of fractures at the base of the radius, consists of 116 pages profusely illustrated with radiographs. The writer deals carefully with the mechanism of the various types of fractures, making by well selected radiographs and tracings each one clear. Treatment of such fractures is made exceedingly plain by photographs and diagrams. There is nothing in the treatment particularly new in the handling of such fractures, yet the volume as a whole is a commendable contribution to the literature of this very common injury.

A Treatise on Regional Surgery. By Various Authors.

Edited by JOHN FAIRBAIRN BINNIE, A. M., C. M., F. A. C. S., Kansas City, Mo. In Three Volumes With Over 900 Illustrations, Including Full Page Color and Half-tones. Philadelphia: P. Blakiston's Son & Co., 1917. Pp. 2100. (Price \$7 each.)

This three volume work on regional surgery is a composite of operative procedures of many of the best known surgeons, both abroad and in this country. It appears to be a development of Doctor Binnie's work on operative surgery into a system of surgery, as, in addition to operative treatment, the authors have discussed etiology, pathology, and surgical diagnosis.

Volume I includes surgical conditions of the head, lungs, thorax, and breast; Volume II, the abdomen, genitourinary system and the spine; and Volume III, the upper and lower extremities. The treatise is not particularly well systematized, and has the common disadvantage of a composite work, in that the ground is either not entirely covered or else there is repetition and overlapping. Altogether, however, the treatise constitutes an excellent book of reference, and, because of the eminent collaborators, it is a work of unusual surgical value.

The volumes are bound in cloth, about 700 pages each, and fully illustrated with about 1,000 half tones and many colored plates.

Problems of Mysticism and Its Symbolism. By Dr. HERBERT SILBERER, of Vienna. Translated by SMITH ELY JELLIFFE, M. D., Ph. D. New York: Moffat, Yard & Co., 1917. Pp. vi-443. (Price \$3.)

Primitive man, fleeing before the *dibledodon* and barricading himself in his cave against the *smilodon*, yet found time to scratch on its walls vague representations of his unconscious strivings. Later, as he rose more and more superior to his environment and gained more leisure, he fashioned for himself many instruments whereon to pipe the stirrings of his desire; fable, folklore, mythology, saga, poetry, drama, and art. The translator of this volume, taking his analogy from paleontology, has called attention in his preface to the rôle which psychoanalysis is playing, not only in the study of the evolution and aberrations of an individual mind, but also in the understanding of the progress of the human psyche through the ages and its expression in varied forms. Some of these are, on the face of them, obscure, and it is only by applying the doctrines of psychoanalysis that we are able to trace their meanings and demonstrate the mechanisms common to all. Professor Silberer, in his work on the symbolism of mysticism, has taken in the first or analytic part an ancient parable for his paradigm, one of those mysterious, poetic productions whereat the romantic mind has been wont to marvel, admire, and fail to understand. After a brief description of the fundamentals of the psychoanalytic method, the author proceeds to show the universal wish fulfillment and sexual complex back of the apparently obscure and absurd phantasy. This analysis leads him on to other fields of mysticism, alchemy, the hermetic art, rosicrucianism, and freemasonry. The second part of the book he has called the synthetic part. Here he shows the connection between mysticism and introversion—the turning away from the outer world and sinking into the inner, the childhood world whose sun is the mother image,

This work is a solid and valuable contribution to the work which psychoanalysis has been doing in many departments of human knowledge, philology, mythology, pedagogy, and the like. Furthermore, it is likely to be a definite aid to the interpretative psychiatrist who is taught to see in the phantasies of his patients an effort to escape from reality and create for himself a world of pleasure, even as the mystics of all ages have done, struggling vaguely to a half guessed goal—a union with some mighty, royal power. This book is uniformly got up with the other psychoanalytic works by the same publishers, paper, binding, and print being good, and the translation reads with a smoothness not universal in translated psychoanalytic literature.

Proflassi e Disinfezione: per uso del R. Esercito. By Dr. V. CHIODI. *Congolamenti: Patogenesi e Cura.* By Dr. F. CASALI and Dr. F. PULLE.

These little pocket sized volumes alike in size and binding are from a series of manuals published by Ulrico Hoepli of Milan. The first deals with the problems of disinfection of clothing and trenches, purification of water supply, prevention and control of contagious diseases; while the second deals with frostbite, its cause, prophylaxis, and treatment of the various degrees of involvement of tissues. The white binding, while attractive, would seem to be too easily soiled to be serviceable, although the material (linen) will stand considerable wear. The illustrations are unusually good for this type of book and the paper is of proper texture and finish to bring out nicely the many original photographs of trench life and other phases of actual military service. The subject of frostbite is a particularly vital one in the Italian army, as almost all its fighting has been done in the snowcapped mountain region. These manuals have sufficient merit to deserve being read by any officer whether of the line or medical department who is familiar with the Italian language.

Births, Marriages, and Deaths.

Died.

ADLER.—In New York, on Saturday, May 4th, Dr. Isaac Adler, aged sixty-nine years.

ATWOOD.—In Brooklyn, N. Y., on Friday, April 26th, Dr. Adelbert Dalton Atwood, aged sixty-eight years.

BELT.—In Millen, Ga., on Tuesday, April 9th, Dr. Lloyd Jones Belt, aged sixty-one years.

BLACKFORD.—In Martin's Ferry, Ohio, on Friday, April 12th, Dr. Robert Alexander Blackford, aged fifty-one years.

BOBRICK.—In New York, N. Y., on Wednesday, April 17th, Lieutenant Abraham Lewis Bobrick, Medical Reserve Corps, U. S. Army, aged twenty-six years.

BOWEN.—In Tyro, Miss., on Monday, April 15th, Dr. A. R. Bowen, aged sixty-nine years.

FRAZIER.—In France, on Wednesday, April 3d, Lieutenant Francis Virgil Frazier, Medical Reserve Corps, U. S. Army, of Altamont, Mo., aged twenty-nine years.

FRIEDMAN.—In Chicago, Ill., on Saturday, April 13th, Dr. Jacob Friedman, of St. Louis, Mo., aged sixty-one years.

HIBBS.—In Brazil, Ind., on Wednesday, April 10th, Dr. Irwin Hibbs, aged eighty-nine years.

INGALS.—In Chicago, Ill., on Tuesday, April 30th, Dr. E. Fletcher Ingals, aged seventy years.

KEOUGH.—In Camp Sherman, Ohio, on Monday, April 15th, Captain Peter L. S. Keough, of Pawtucket, R. I., aged twenty-eight years.

KING.—In Wyoming, Ohio, on Wednesday, April 10th, Dr. James Buchanan King, aged fifty-four years.

LITCHFIELD.—In Camden, N. J., on Wednesday, May 1st, Dr. Paul N. Litchfield, aged forty-five years.

LONG.—In Lewistown, Mont., on Thursday, April 11th, Dr. Willard A. Long, aged sixty-eight years.

MOORE.—In Camp Kearney, San Diego, Cal., on Monday, April 8th, Lieutenant Hugh Tate Moore, Medical Reserve Corps, U. S. Army, of Wilmington, N. C., aged thirty-one years.

WADSWORTH.—In Tulsa, Okla., on Saturday, April 13th, Dr. Daniel U. Wadsworth, aged forty-four years.

WATERS.—In Terre Haute, Ind., on Sunday, April 14th, Dr. Moses H. Waters, aged thirty-seven years.

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NEW YORK, SATURDAY, MAY 18, 1918

WHOLE No. 2059

Original Communications

AN ELECTRO OPERATIVE BONE CLAMP.

By FRED H. ALBEE, M. D., Sc. D., F. A. C. S.,

New York,

Major, Medical Reserve Corps, U. S. Army; Professor and Director of Orthopedic Surgery, in New York Postgraduate Medical School and Hospital.

While it is not to be expected that every hospital and every individual surgeon should have at hand at any and all times a traction table, it is nevertheless feasible and desirable that those who undertake to treat fractures should have as part of their armamentarium a motor driven bone clamp which can be readily transported with the other bone instruments.

Even if the surgeon possesses a traction table, the traction force obtained with it is exerted upon the whole limb including soft parts and not upon the individual bone, and is, frequently, not fully effectual. For example, in the case of malunited overriding fragments of the femur, I have repeatedly observed that many pounds of traction applied to the region at or above the kneejoint or to the ankle have failed to accomplish the desired amount of distraction, whereas much less force applied by means of the motor clamp under discussion or by means of a lever skid, has accomplished the distraction quickly and easily. Most of the clamps hitherto in use are incapable from a mechanical standpoint, of producing the requisite amount of distraction or else are not sufficiently strong or mechanically powerful to overcome the contraction of the strong muscles and the normal elasticity of the other soft tissues surrounding the larger bones.

I do not advise that this clamp be used to the exclusion of the traction table but on the contrary, strongly urge that it be employed in difficult cases, in conjunction with the latter, although it has been found that the clamp can be successfully used alone and is a most powerful instrument per se. In several instances of malunited fracture of the femur of several months' duration and with two thirds inches of shortening (overriding), the fragments have been easily and quickly distracted and brought into alignment with little muscular exertion on the part of the operator for the reason that all the energy has been expended on the bone fragments themselves.

From an extensive experience with the most difficult cases of both fresh and malunited fractures as well as with all other phases of bone surgery, I have been more and more impressed with the importance of conserving the surgeon's mental and

physical energy and minimizing the element of muscular fatigue. As a matter of fact many bone operations have been poorly executed or their objectives unattained because of muscle spasm in the surgeon's forearm or other disability produced by the excessive physical exertion incidental to one or more arduous cases. The busy, overworked surgeon,

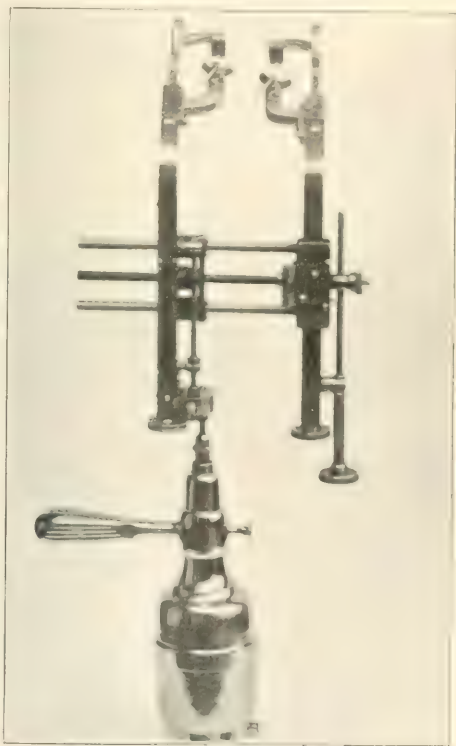


Fig. 1.—Electro Operative Bone Clamp with motor.

whose physical and nervous economy is constantly running at the upper limit of endurance, should appreciate the importance of conserving his energies and should omit no means to that end; for instance, he should avoid carrying a heavy bag of instruments immediately before an operation, for even the

trivial muscular fatigue and spasm thus acquired may militate to a greater or less degree against the smoothness of his work.

The foregoing statements give added strength to the arguments for the universal application of electric power in bone plastic surgery even if we do not take into consideration the paramount advantage of the rotary cutting tools which produce automatic (machine) fits—for example, the twin saw, which not only produces the gutter but also removes the bone graft and thus ensures a perfect inlay; or the dowel shaper whose cutter being exactly commensurate with the corresponding drill, ensures the most accurate fit of a bone peg fashioned with the dowel shaper and inserted in a hole produced by the equivalent drill. I take a pardonable pride in having in-

roduced into plastic bone surgery not only the use of electric power but also automatic machine tools whose field of usefulness has proved to be wider than the technic of bone grafting, although the range

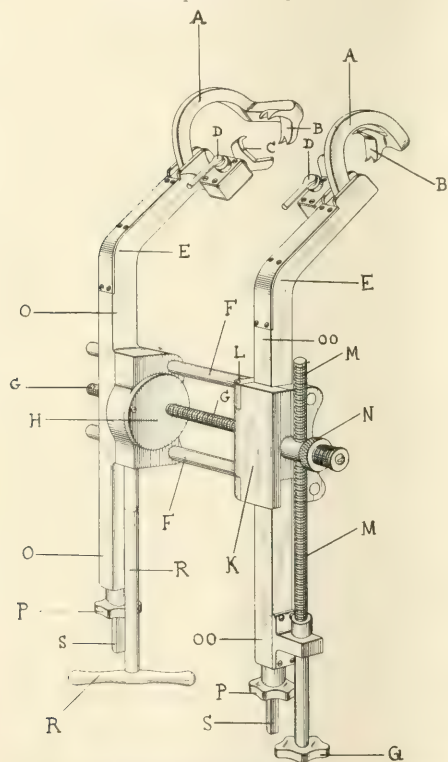


FIG. 3. Details of motor bone clamp (hand driven). A, curvature of jaw permitting the clamping of fractured bones from the top, without the loosening of all tissues; B, rigid claw; C, movable claw in swivel ball joint; D, level to lock movable claw in place; E, angle of guides O and OO, the Albee motor works freely between the jaws, as the angle of the jaws is with the axis of the motor; F, screw threaded through handle which guides O travels; G, screw threaded rod, running through gear box H, transmitting the driving power from handle R; H, transmission gear box made from noncorrosive metal, thus allowing sterilization by boiling; I, cover of gear box; J, screw covered by plastic plate, preventing the loosening knurled screw; K, hinge on split box; L, hinge on split box; M, screw threaded rod set in motion by turning thumb nut Q, controlling the longitudinal movement of guide OO; N, thumb nut controlling the transverse movement of the guide OO; O, thumb nut controlling the opening and closing of claws B and C; Q, thumb nut moving the driving rod through the gear box; R, removable handle of the motor; S, extensions of thumb screws P. This handle is used for final tightening of thumb screws P by inserting the handle in S; S, extensions of thumb screws P.

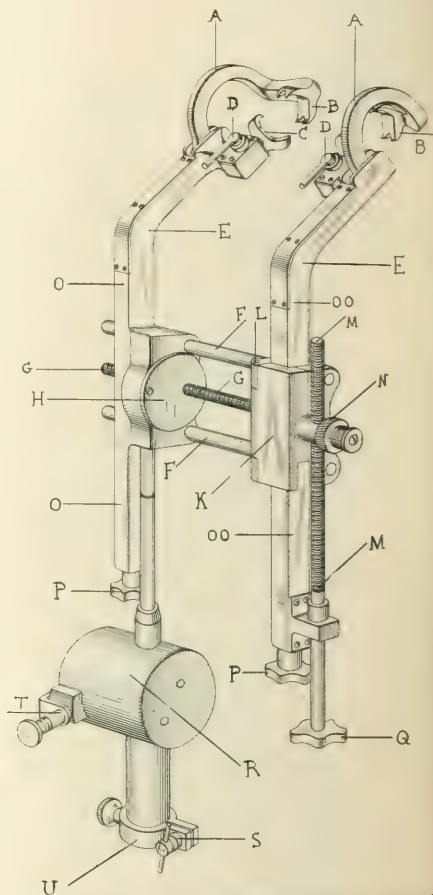


Fig. 3.- Details of motor bone clamp. The motor drive; R, attachment for cutting down the speed of the Albee motor when the motor is used as driving power; S, clamp for tightening the Albee motor to gear attachment; R, T, lever for changing the transverse movement of guide O from closing to opening of clamp; U, opening where motor is placed. The other letters are the same as in Fig. 2.

of applicability of the latter has been thereby greatly increased.

Disadvantages of the bone clamps hitherto used.—(a) The arms of the old instruments were applied from below; in this new clamp they are applied through the incision directly from above. Application of the gripping portion of the clamps hitherto manufactured required wide dissection and separation of the soft tissues from the fragments in order to permit the clamps to be locked upon the bone from below (*e. g.*, the Lowman clamp). This is undesirable if avoidable since it temporarily impedes the circulation in the bone in the region of the fragment ends on account of the separation of the over-

lying soft parts. (b) No bone clamp previously manufactured could be motor driven. (c) Absence of curves in the clamping arms afforded insufficient working space, interfering with the application of the motor and therefore did not permit (while the

clamp herein described for distracting and properly aligning the displaced fragments of a fractured bone in response to numerous requests for a bone clamp which should serve as an adjunct to the Albee motor outfit and which could be carried with the rest of

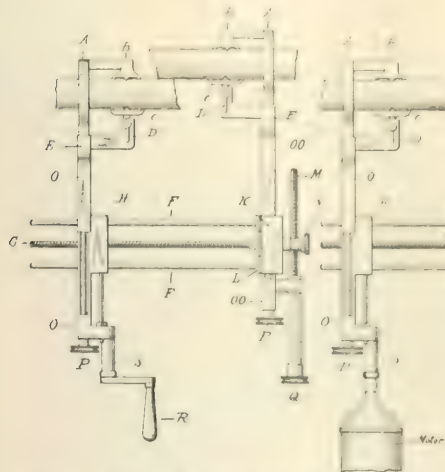


FIG. 4.

Figs. 4, 5, and 6.—The mechanism for distracting and bringing into alignment the fragments of a fractured bone. In Fig. 4 the fragments have been separated by a north and south movement of the clamp, i. e., in the long diameter of the bone, and in Fig. 5 the alignment has been brought about by a north and south movement of the bone, i. e., at right angles to the long diameter of the bone.

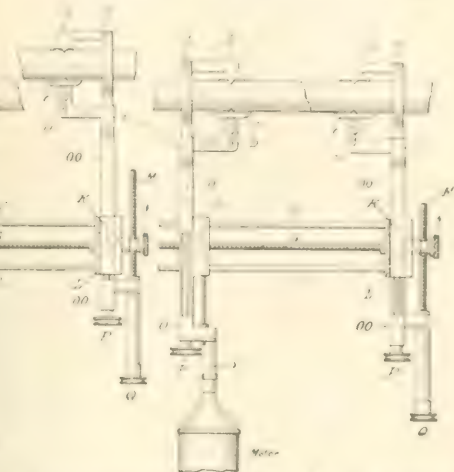


FIG. 5.

Fig. 5.—The fragments of a fractured bone are brought into alignment by a north and south movement of the bone, i. e., at right angles to the long diameter of the bone.

clamp remained attached) the execution of the inlay graft technic and certain other procedures. (d) The clamps now in use lack suitable jaws for gripping the superior surface of the fragments and do not possess claws which are adjustable to fragments of conical shape or to those possessing oblique surfaces.

Advantages of the electro operative bone clamp.—

(Figs. 1-10) I recently devised the motor bone

clamp possessed numerous practical advantages over the clamps in common use because: Although the instrument can be operated entirely by hand, its adaptability to motor power is one of its special features, minimizing the expenditure of time and labor required for its manual operation. Less dissection is required (Fig. 9) the jaws of the clamps being applied directly to the anterior surface of the

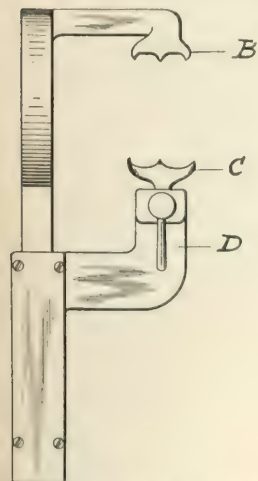


FIG. 7.—Top view of curvature of jaw to show claws and swivel arrangement of movable claw.

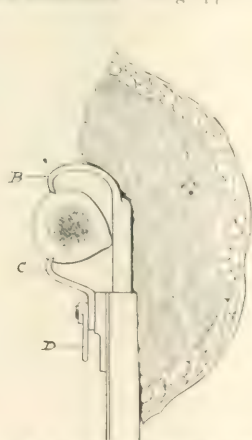


FIG. 8.—Detail of application showing the mechanism of clamping and the aid mechanism, from the inferior surface of the bone.



FIG. 9.—Detail of application showing the mechanism of clamping and the aid mechanism, from the superior surface of the bone.

bone, thus obviating the necessity of the separation of the soft parts from the bone fragments (Fig. 8), which is most desirable. The clamp is so devised that free access to the superficial portion of the bone is afforded for the implantation of an inlay bone graft or fixation splint of whatever kind the surgeon is using. Furthermore the gripping claws are so formed and placed that they do not interfere with the operation of the author's twin saw (Fig. 10). The deep curve of the long arms of the clamp allows

irregularly shaped it may be. The fixed arm (O) attached to the clamp is then applied to the other fragment. After the rigid claws (c) of both arms are in proper position, the swivel ball joint claws (E) are made to grip the bone by the hand screws (P) and are then locked by moving the lever locks (D). The motor is then attached to the instrument by means of its shaft (Fig. 5).

Use.—The motor is now put in operation and when the desired amount of distraction has been secured (Fig. 5) by movement of the arm (OO) in an "East and West" direction along the lateral transverse bars (F), the fragments are moved into alignment in the long diameter of the bone by operating (Q). The ends of the fragments are now allowed to come into end to end apposition by the reverse gear (indicated in Fig. 3), if necessary, whereupon the fragments are ready for operation. The fragments are now in perfect alignment and apposition, and the clamp holding them firmly. The superficial surface of these fragments lies exposed, unobstructed by any part of the clamp. The conditions are thus ideal for readily applying the bone graft or other fixation agent.

(I wish to acknowledge my indebtedness to Mr. R. E. Klett of the Klett Manufacturing Co., Inc., of New York, for his assistance and cooperation in the manufacture of this instrument.)

40 EAST FORTY-FIRST STREET.

A STUDY OF IMAGES REFLECTED FROM THE CORNEA, IRIS, LENS, AND SCLERA.

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PART I.

INTRODUCTION.

It is generally believed that the accommodative power of the eye is due to a change in the curvature of the lens. This view, Helmholtz says, was first advanced by Descartes (1596-1650), while the first proofs in support of the theory were presented by Young in his celebrated treatise on the *Mechanism of the Eye*, published in 1801.

The theory attracted little attention at the time, but was accepted later, mainly upon the authority of Helmholtz, whose investigations into the cause of accommodation were published about the middle of the last century. Helmholtz was led to this conclusion by what appeared to him to be changes in the size of an image, or images, reflected from the front part of the crystalline lens. It appeared to him that during accommodation these reflections were smaller than when the eye was at rest; and since an image reflected from a convex surface is diminished in proportion to the convexity of that surface, he concluded the front of the lens must become more convex during accommodation. In the cornea he observed no change, and while he believed that a change took place in the back of the lens, he considered it so slight as to be negligible. Helmholtz used for his experiments: first a candle so placed that it was reflected from the cornea and the two surfaces of the lens; and then two lights—

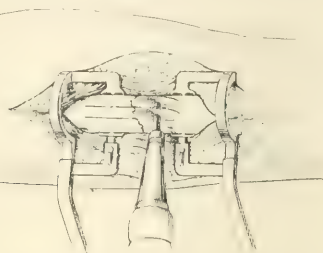


FIG. 10. The field of operation with the clamp applied seen from above, showing the twin saw at work. Note that the clamps do not interfere in the slightest degree with the cutting instrument.

the motor and the overhanging portions of the instrument to be depressed below the level of the field of operation, out of the surgeon's way (Fig. 10). The swivel ball joint by which the claws are connected with the apparatus permits adjustment in any direction and to any size and shape of bone (C. Figs. 2 and 3). The arms of the instrument are detachable and can be applied to each fragment separately and the clamp then put together somewhat in the manner of an obstetric forceps. All hand screws for opening and closing the clamps and adjusting their arms lie in the same plane and close together, and are readily accessible to the operator and are not in the way of the motor during its use (Fig. 2-6). After the removable arm has been applied to its appropriate bone fragment it is adjusted to the body of the instrument by a simple mechanism consisting of a receptive lock box in which it is retained by the hinged lid and held in place by a lock nut (Figs. 2-6). The instrument contains a reverse gear by which motive power can be instantaneously changed from right to left or the reverse, in order to widen or diminish the distance between the fragments (Fig. 3). The clamp is so constructed that it can also be operated by hand in case the surgeon does not possess the Albee electro operative motor outfit. (The motor manufactured by Kny-Scherer Co. possesses the proper coupling device.)

Technic of application and use of the motor bone clamp.—(Fig. 2-6) After incision and superficial separation of the soft tissues have accomplished sufficient exposure of the fragments, the clamp is applied directly to them from above as follows:

Application.—The removable arm (OO) is detached from the instrument, or not, as seems best, and applied to either the proximal or the distal fragment, after which it is inserted in the lock box (K) and fastened by turning the lock nut (N). By means of the lever lock (D) the ball and socket claw (B) is loosened so that it will adapt itself to the contour of the fragment to be grasped however

or one doubled by reflection from a mirror—so placed behind a diaphragm having two rectangular openings that the rays shone through the openings upon the cornea and lens. Of the images thrown upon the lens by means of the naked candle he says in his *Handbuch der Physiologischen Optik*, page 121:¹

"Both these images are very much tainter than the reflection from the cornea. That from the front of the lens forms an upright image of the flame somewhat larger than that reflected from the cornea, but usually so faint that the form of the flame cannot be definitely distinguished."

The results obtained when a diaphragm was used with two lights were better. Two images were then formed on each of the reflecting surfaces; and it appeared to the investigator that those on the front of the lens approached each other during accommodation and separated when the eye was at rest. (See diagram, *Handbuch der Physiologischen Optik*, p. 122.)

Helmholtz appears to have been convinced of the correctness of these observations and of the theory based upon them, and was only doubtful of the means by which the supposed change was accomplished. His explanation of the phenomenon of accommodation was soon universally accepted, and has been universally stated as a fact. It is the accepted belief of modern ophthalmology, and has been summed up by De Schweinitz in his recent textbook on the eye as follows:

"Inasmuch as the eyeball is inextensible, it cannot adapt itself for the perception of objects situated at different distances by increasing the length of its axis, but only by increasing the refractive power of its lens." (*Diseases of the Eye*, pp. 24 and 25.)

There have, however, been many other theories of accommodation. Arlt ascribed the phenomenon to a lengthening of the eyeball, but later abandoned the theory out of deference to the authority of Helmholtz and Cramer. In the introduction to his treatise on shortsight (*Über die Ursachen und die Entstehung der Kurzsichtigkeit*) he says:

"An hypothesis of the mechanism of accommodation (movement of the posterior wall of the eye—*Locomotion der hinteren Augenhaut*) which later was proven to be untenable led me to the question whether, in myopia, the eyeball, as was to be expected according to that hypothesis, might be lengthened in the direction of the sagittal axis, and in the course of time it was possible to present anatomical proof that shortsight was generally associated with such a lengthening, due to a permanent bulging (*Rückdrängung*) of the posterior wall."

Since the introduction of the ophthalmoscope into ophthalmological practice and since the demonstration by Cramer and Helmholtz that accommodation is effected through a change in the form of the lens, not of the eyeball, many different theories as to the origin and development of shortsight in relation to the aforementioned deviations from the normal in the shape of the eyeball have been advanced and defended."

By some the muscles of the eye were believed to play a part in accommodation. Of this theory Donders says:

"Before physiologists were acquainted with the changes of the dioptric system they often attached importance to the external muscles in the production of accommodation. Now that we know that accommodation depends on a change of form in the lens this opinion seems scarcely to need refutation." (*The Anomalies of Accommodation and Refraction of the Eye*, p. 22.)

According to other theories, accommodation is effected by a change in the curvature of the cornea; by a change in the position of the lens; by the contraction of the pupil; through the agency of the iris and so on. Almost every imaginable hypothesis has apparently been advanced to account for the phenomenon, some of the guesses being so wild that Donders refused even to refer to them, considering they would detract from the scientific character of his work.

My own experiments, carried on during the last five years in the Physiological Laboratory of the College of Physicians and Surgeons, Columbia University, New York, and at the New York City Aquarium, demonstrate that the lens is not a factor in accommodation, but that the change of focus necessary for perfect vision at different distances is effected by a change in the length of the eyeball, brought about by the action of the muscles on the outside of the globe. In the earlier of these experiments, the results of which were published in the *NEW YORK MEDICAL JOURNAL* of May 8, 1915, it was found that accommodation, as measured by the objective test of simultaneous retinoscopy, occurred in all normal eyes of dogs, rabbits, and fish after the removal of the lens, and that it never occurred after one or both of the oblique muscles had been cut across and the insertion of the muscle to the fascia completely separated. It was also found that any form of refractive error could be produced in the normal eyes of these animals by manipulation of the outside muscles of the eyeball, indicating that these conditions are not due to permanent deformations in the shape of the eyeball, as generally believed.

By normal eyes is meant those in which, in addition to other conditions of a healthy structure, both oblique muscles are present and active. In some animals it was found that one oblique muscle was absent or rudimentary. This was true in the case of all cats, and accommodation could never be produced in these animals by stimulation with electricity. Even in cats, however, when the rudimentary oblique muscle was strengthened by advancement, accommodation was always produced by stimulation of the eyeball, or of the third or fourth nerves, near their origin in the brain, the fourth nerve, contrary to previous belief, being just as much a nerve of accommodation as the third.

After the results of these experiments were published it was suggested to me by Dr. Frederic S. Lee that it would be well for me to repeat the experiments of Helmholtz, making a thorough investigation of accommodation from a study of the images reflected from the front of the crystalline lens and other parts of the eyeball. This work was under-

¹"Diese beiden Reflexe, die so, b und c, sind sehr viel lichtschwächer als der Reflex der Hornhaut, a. Der von der vorderen Linsenfläche, b, bildet ein aufrechter, lebendes Bildchen der Flamme, etwas grösser als das von der Hornhaut entworfen, aber nicht so verwischt, dass man die Gestalt der Flamme nicht genau erkennen kann. *Handbuch der Physiologischen Optik*, p. 121."

taken some four years ago. For a year or more I was unable to obtain an image from the front of the lens which was sufficiently clear or distinct to be measured. It was much blurred, and because of this lack of distinctness, it was impossible to tell whether it became smaller or larger during accommodation. With a diaphragm I got a clearer image, but it still was not sufficiently clear to be measured. To Helmholtz the indistinct image of the naked candle seemed to show an appreciable change, while the

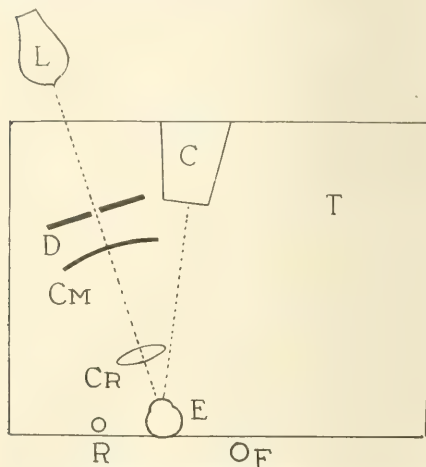


FIG. 1.—Adjustments for obtaining images on the lens, iris, and front of the sclera. T, table; C, camera; L, light, 1,000 watts; D, diaphragm; CM, concave mirror; CR, condenser; R, stand for chin rest; F, stand for forehead rest; E, eye.

images obtained by the aid of a diaphragm showed it more clearly; but I was unable, either with a diaphragm or without it, to obtain images which I considered sufficiently distinct to be reliable. Men who had been teaching and demonstrating Helmholtz's theory repeated his experiments for my benefit, but the images which they obtained on the front of the lens did not seem to me to be any better than my own.

After a year or more of failure I began work at the Aquarium on the eyes of fishes. It was a long story of failure. Finally, I became able, with the aid of a strong light—1,000 watts—a diaphragm with a small opening, and a condenser, to obtain, after some difficulty, a clear and distinct image from the cornea of fish. This image was sufficiently distinct to be measured, and after many months a satisfactory photograph was obtained. Then the work was resumed at the Physiological Laboratory on the eyes of human beings. By means of nearly the same technic an image was obtained on the front of the lens which was sufficiently clear and distinct to be photographed. This was the first time, so far as I have been able to ascertain, that a clear image was ever photographed from the front of the lens. The work was continued, until, after almost four years of constant labor, I finally obtained satisfactory pictures, not only from the front of the lens, but also from the iris, cornea, the front of the sclera, and the side of the sclera.

PART II.

TECHNIC BY WHICH THE IMAGES WERE OBTAINED.
THE FRONT OF THE LENS.

Strength of the light.—Experiments were made first with a candle and then with electric lights of thirty watts, fifty watts, 250 watts, and 1,000 watts.

With a candle as a source of light a clear and distinct image could be obtained on the cornea. On the posterior surface of the lens it was quite clear; but on the front of the lens it was very imperfect, undefined, and of extremely variable intensity. At times no reflection could be obtained at all, while at others the size varied within wide limits, regardless of the angle of the light to the eye of the subject, or of the eye of the observer to that of the subject. Again the size might remain very nearly the same, and yet there would be a wide variation in the appearance of the image. After studying these appearances almost daily for more than a year, no reliable observation could be made. In fact, it seemed that an infinite number of variable appearances, or images, might be obtained on the front of the lens when a candle was used as the source of illumination.

With a thirty watt lamp, a fifty watt lamp, a 250 watt lamp, and a 1,000 watt lamp there was no improvement. The light of the sun reflected from the front of the lens produced an image just as cloudy and uncertain as the reflections from other sources of illumination, and just as variable in shape and size. To sum it all up, I was convinced that the front surface of the lens was a very poor reflector of light, and that no reliable reflections could be obtained from it by the means described. But with a condenser and diaphragm, the use of which was suggested by their use to improve the illumination of a glass slide under the microscope, and a 1,000 watt lamp, satisfactory results were at last obtained, although many difficulties still remained to be overcome. The addition of a condenser and the use of



FIG. 2.—Multiple images. Photograph showing three images of the electric filament in the pupil. They are reflected from the different surfaces of the lens.

a strong light proved to be a decided improvement over the method of Helmholtz (Fig. 1).

Reflections.—Complicating reflections were a perpetual source of trouble. Reflections from surrounding objects were easily prevented, but those from the sides of the globe were difficult to deal with, and it was useless to try to obtain images on

the front of the lens until they had been eliminated, or reduced to a minimum, by a proper adjustment of the light. The same adjustment, however, did not always give similar results. Sometimes there would be no reflections for days; then would come a day when, with the light apparently at the same angle, they would reappear. When the light was placed below the point of fixation the best results were usually obtained by directing the long axis of the globe exactly toward the eye and then tipping

the diaphragm and change the axis of fixation, and still the image would be clouded or obscured and its outline distorted. The cause of the difficulty appeared to be that the light was not adjusted at the best angle for the purpose, and I was not always able to determine exactly what this was. As in the case of the reflections from the sides of the globe, it seemed to vary without a known cause. There were, however, angles of the axis of the globe which gave better images than others, although these angles could not be determined with exactness. I have labored with the light for two or three hours without finding the right angle. At other times the axis would remain unchanged for days, giving always a clear, distinct image.

It was interesting to note that there were angles of the line of the light to the eye at which a clear and distinct image could be obtained from the iris, and none whatever from the front of the lens; also that with some adjustments no image could be obtained from the cornea, although the cornea is a much better reflecting surface than any other part of the eye. When the adjustments were such that an image could be obtained from the front of the lens, however, one could always be obtained from the iris, or the front of the sclera, and sometimes from the cornea also.

Distance of the light from the observed eye.—The distance of the light from the observed eye was very important. By experiment it was found that when the lamp was adjusted at a distance of

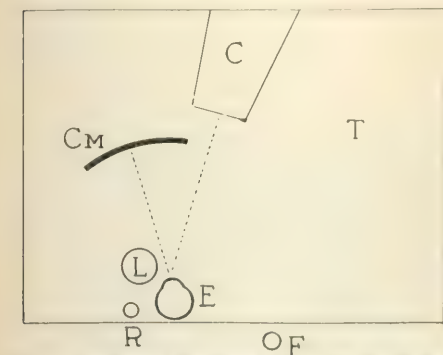


FIG. 1. Adjustments for obtaining a large image on the cornea. T, table; E, eye; L, light; C, candle power; CM, concave mirror; R, stand for chin rest; F, stand for forehead rest; C, camera.

the front downward so that the angle of its axis to a line drawn from the light to the eye was about ten degrees. By this adjustment reflections were often prevented entirely. The subject was able to tell when a satisfactory adjustment had been obtained by regarding the reflection of his eye in a concave mirror.

Multiple images.—With some adjustments of the light, multiple images were seen reflected from the front of the lens (Fig. 2). Sometimes these images were arranged in a horizontal line, sometimes in a vertical one and sometimes at angles of different degrees, while their distance from each other also varied. Usually there were three of them. Sometimes there were more; and sometimes only two. Occasionally they were all of the same size, but usually they varied, there being apparently no limit to their possibilities of change in this and other respects. Some of them were photographed, indicating that they were real reflections. Changes in the distance of the diaphragm from the light and from the condenser, and alterations in the size and shape of its opening, appeared to make no difference. Different adjustments of the condenser were equally without effect. Changes in the angle at which the light was adjusted sometimes lessened the number of images and sometimes increased them, until at last an angle was found at which but one image was seen. The images appear, in fact, to have been caused by reflections from the globe of the electric light.

Distinctness of the image.—Even after the light had been so adjusted as to eliminate reflections it was often difficult or impossible to get a clear and distinct image of the electric filament upon the front of the lens. One could rearrange the condenser and

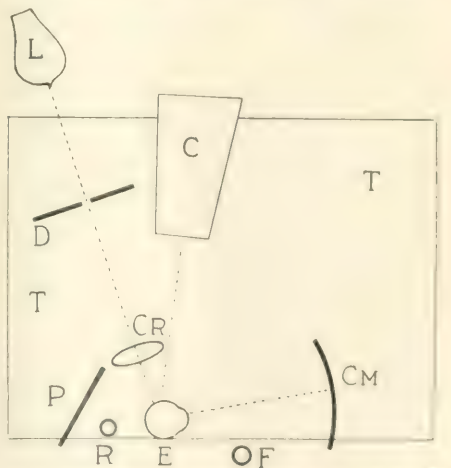


FIG. 2. Adjustments for obtaining multiple images. T, table; E, eye; L, light, 1000 watts; P, plane mirror; CM, concave mirror; R, stand for chin rest; F, stand for forehead rest; D, diaphragm.

nearly sixty-five inches from the eye an image of a desirable size could be obtained on the front of the lens; that is, it almost filled the area of the moderately dilated pupil of a normal eye. When the light was brought closer, the image obtained in the pupil was too large, less clearly defined, and less bright. With the light at a greater distance than sixty-five inches the image, although brighter

and more distinct, was so small that it could not be so readily measured.

The diaphragm.—The diaphragm was usually a piece of cardboard from two to six inches square, with a small opening in the centre. The smaller the opening the more distinct the image, but it was also less bright than when the opening was larger. When the opening was too large, or when the diaphragm was not used at all, the image obtained was very cloudy and indistinct. An opening one eighth to a quarter of an inch in diameter was found to be the most satisfactory. If it were made smaller, so little light was thrown upon the front of the lens that no distinct reflection was obtained. The shape of the opening seemed to be immaterial, as good

results were obtained whether it was round, triangular, or square, regular or irregular. The distance of the diaphragm from the light and from the eye was very important. By varying this, one could increase or diminish the size of the image, its brightness or its distinctness. The closer it was placed to the eye, within certain limits, the smaller, more distinct, but less bright the image. Usually it was placed about forty-eight inches from the light. When brought closer than this, with a small opening, an image could be obtained on the front of the lens without the aid of the condenser; but it was not sufficiently clear or distinct. It should be emphasized that changes in the size of the opening, or in the distance of the diaphragm from the light, would alter very materially the size of the image reflected from the lens.

The adjustment of the opening in the diaphragm in its relation to the light was best made by the subject, who regarded the light with the condenser removed, using a blue glass screen to mitigate its intensity. When the subject obtained an adjustment of the opening which enabled him to see the light clearly, the diaphragm was moved to his right until the light was just at the edge, or beyond the edge of the opening. This adjustment of the diaphragm in its relation to the light and the left eye of the subject yielded better results after the condenser was adjusted than when the light could be



FIG. 5.—Images reflected from the anterior surface of the lens. The images are located in the lower and outer quadrant of the pupil. To the left of each is an accidental reflection from the cornea which could not always be prevented. It often resulted from a slight tipping of the condenser. Below the pupil is a reflection from the cornea produced by a thirty candle power lamp placed on the table to illuminate the eye while the photographs were being taken. Note the absence of a corneal image of the filament. The light was placed at an angle of ten degrees below the line of fixation and the subject regarded a concave mirror just above the condenser. The axis of the camera formed an angle of ten degrees with the line of fixation. R, rest. Simultaneous retinoscopy indicated emmetropia. A, accommodation. Simultaneous retinoscopy indicated myopic refraction of 6.00 D. The photographs show no appreciable change in the size of the image, and no change was noted by the subject or the observer. Note the change in the corneal reflection which indicates a change in the position of the eyeball during accommodation.

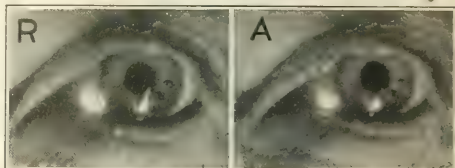


FIG. 6.—Images on the front of the sclera. R, rest. By simultaneous retinoscopy the refraction was emmetropic. A, accommodation. Simultaneous retinoscopy, concave 3.00 D. The image is smaller than when the eye was at rest, indicating an increase in the convexity of the surface of the sclera, a condition which one would expect when the eyeball was elongated.

seen by the subject through the opening with the condenser removed.

The concave mirror.—The mirror was three and a half inches in diameter, with a focus of nine inches, though a smaller mirror might be used or a plane one, but the latter would not be so satisfactory, because the image would not be seen so clearly as when magnified in a concave glass. The mirror was supported at the end of a horizontal bar, with its plane at right angles to the line of fixation, and its centre at the same height from the table as the eye of the subject. The horizontal bar moved back and forth in the opening of an arm supported by a stand, and an adjustment was used whereby the arm could be raised or lowered, and turned at different angles on a horizontal plane. The horizontal bar was placed in the axis of vision, and when the mirror was properly adjusted, it could be moved toward or away from the eye, without altering the angle of fixation when the subject regarded the reflection of the image upon the front of the lens. The mirror was a great convenience in adjusting the diaphragm, the condenser, and the light; because

the image was seen therein by the subject more clearly than by the observer, and the former could, therefore, determine the accuracy of the adjustments better than any one else. When the light was placed on a level with the eye it was necessary, in order that the subject might see past the condenser and observe the reflection of his own eye in the mirror, to place the latter in such a way that the axis of vision was at least ten degrees to one side of the line of the light. When the light was lowered ten degrees or more below the axis of vision, the mirror was placed directly over the line from the eye to the light, in order to enable the subject to see his own eye in the mirror over the top of the condenser. When the mirror was adjusted

stronger lens produced a brighter and smaller image; it had to be brought closer to the eye; and its adjustment required more careful manipulation, this being the greatest objection to its use. With a weaker condenser, +6.00 D. S., the image was too large for the size of the pupil. The condenser was supported by a stand, with an adjustment by which it could be raised or lowered, rotated either on its vertical or its horizontal axis, and moved nearer to or farther from the eye as desired. In nearly all cases the best results were obtained when the condenser was supported vertically, and was held nearly at an angle of ninety degrees to the line from the light to the eye. When tipped on its vertical or its horizontal axis five degrees, or even less, toward the light, or away from it, a clear and distinct image could not be obtained. Without a diaphragm the image focussed by the condenser on the lens was cloudy, but with a diaphragm a clear and distinct image was obtained with the condenser at about three inches from the eye. With a diaphragm, and the condenser at more than four inches from the eye, a faint and unsatisfactory image was sometimes produced. This was the cause of much trouble until the fact that there were two points at

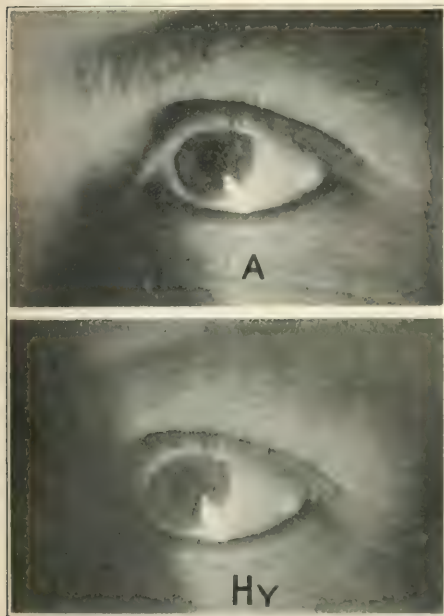


FIG. 1. Reflections from the side of the sclera. The hypermetropia. The eye was straining unaccommodated to see the image at a near point. Simultaneous reflexes produced hypermetropia of 14 D. Note that the image is the smaller. A diaphragm, simultaneously removed, produced myopic refraction of 10 D. In the image is the larger. The reflections from the sclera tend to illustrate the eye seen at the subnormal angle, also show well marked changes in their angle to the horizontal or vertical axes of the eye, which are also offered as evidence that the shape of the eyeball is changed during accommodation and when hypermetropia is produced.

as close to the line of sight as it was possible to place it, clear and distinct images were seen by the subject reflected from various parts of his eye. Photographs were taken with the axis of vision not less than ten degrees from the line of the light to the eye. It should be understood that the images were photographed from the eye itself, not from the reflection in the concave mirror.

The condenser.—The condenser was a convex 11. D. S., about an inch and a half in diameter. This strength was found to be the most satisfactory in obtaining clear and distinct images. A



which an image could be obtained was discovered. Without the diaphragm, one of these points, the more distant one, was eliminated. It was therefore found to be an advantage to focus the condenser with the diaphragm removed, and then, after replacing the latter, to continue the adjustments. The conditions under which the fainter image was produced, with the condenser at a greater distance from the eye, were not discovered. The fact is mentioned, however, for the benefit of any one who may desire to repeat these observations.

Apparatus for supporting the head.—A more difficult part of the technique had to do with the apparatus for holding the head of the subject perfectly steady while the pictures were being taken. A wooden rod, firmly supported anteriorly and covered with a stretch paper, was passed by the teeth, and served to hold that part of the head steady. A second horizontal rod passed around the forehead, and it was sometimes an advantage to have a vertical rod pressing on the right temple. The subject was seated in a comfortable position.

THE CORNEA.

A thirty candle power lamp—simply an ordinary electric globe—is sufficient to form a very large image on the cornea. It can be placed within an inch or two of the eye, as the heat is not great enough to interfere with the experiment. The closer it is, the larger the image. A blue glass screen can be used, if desired, to lessen the discomfort of the light, as the photographs of the image and the time of exposure will be the same whether the light is blue or white. The white light, however, is easier to focus than the blue. For absolute accuracy the light should be immovable, but for demonstration this is not essential. The subject can hold the bulb in his hand, and can demonstrate that the image varies according to whether the eye is at rest, accommodating normally for near vision, or straining to see at a near or a distant point. The clearness of the image may vary according to whether the light is adjusted vertically, horizontally, or at an angle. When the left eye is used by the subject—and in all the experiments it was found to be the more convenient one for the purpose—the source of light is placed to the left of that eye, and as much as possible in front of it—at an angle of about forty-five degrees. For demonstration it is not necessary that the eye of the subject should be immovable. He can look into a plane mirror, or into a concave one, which enlarges the image, using the image itself as the point of fixation, and the distance at which the eye focus can be altered by changing the distance of the mirror from the eye. The mirror should be fastened to a rod which moves in a groove backward and forward, and the angle of the rod must be so adjusted that the angle of fixation does not change when the mirror approaches the eye, or is withdrawn from it. The eye should be able to see the reflection by looking straight ahead, and the closer the reflection is to the edge of the mirror on the camera side the closer the camera can be brought to the line of fixation (Fig. 3).

Usually, not always, the retinoscope indicates that the eye is at rest—emmetropic—at the farthest distance of the mirror from the eye at which the subject is able to see the details of the reflection clearly. The greatest amount of accommodation is obtained at the nearest point at which the filament of the electric light can be seen distinctly. At this point the filament is distinctly smaller than when the eye is at rest. When the mirror is moved so far away that the image is no longer seen clearly, and the eye strains to see it more distinctly, the retinoscope indicates myopic refraction and the image again becomes smaller than when the eye is at rest. When the mirror is brought so close to the eye that the image appears indistinct and the eye again strains to see it more distinctly, the retinoscope indicates less myopic refraction and the image becomes larger. If the strain to see it is great enough, the eye becomes hypermetropic, and the image appears larger than when the eye is at rest. All these changes in the size and shape of the image can be correctly observed by the subject.

The angle of the camera to the optic axis is not very important. Better pictures can be obtained,

however, when the camera is directed as nearly as possible on a line with the optic axis. Satisfactory pictures are obtained when the angle is thirty, forty or even sixty degrees, but after passing beyond sixty the results are not at all good. Generally it is not possible to get an angle smaller than ten degrees. While the photographs are being taken a screen should be placed between the light and the mirror to prevent the formation of a double image on the cornea.

THE SIDE OF THE SCLERA.

To obtain an image from the side of the sclera, a plane mirror was used in addition to the concave one and other apparatus previously mentioned. It was about three inches in diameter, was supported on a stand at about the height of the eye, and was held vertical to the surface of the table, with one edge resting against the left temple of the subject and the opposite edge tipped about thirty degrees from the plane of the temple toward the nose. The concave mirror was so placed that the horizontal bar which supported it made an angle of about eighty degrees with the line from the eye to the light. When the two mirrors were properly adjusted, the image of the filament was reflected from the plane mirror into the concave mirror, where it was seen by the subject an inch or more above the centre. The concave mirror was so adjusted that when it was moved nearer to, or farther away from the eye, the angle of fixation did not change. The condenser was slightly, perhaps half an inch, farther from the eye than from the centre of the plane mirror, and was almost in contact with the edge of the mirror on the side nearest the light. Numerous very small reflections from the neighborhood of the sclera were a source of failure which was not easily overcome. Sometimes these reflections were very numerous when the image was reflected from the side of the sclera, and absent when it was reflected from the part nearer the cornea. They were finally eliminated by adjustments of the light. Another difficulty was the dropping of the upper eyelid. This occurred when the point of fixation was lower than the eye, and was corrected when the eye looked more nearly straight or slightly above the horizon. To accomplish this the concave mirror was lowered part of an inch. The camera was placed where the object glass was seen by the subject in the space between the two mirrors. The axis of the camera made an angle with the line from the light to the eye of about fifteen degrees. The adjustments of the light, diaphragm, condenser, chin rest, head rest, two mirrors and the camera required a great deal of care. The subject was placed in a comfortable position to avoid the slightest strain, and during the few minutes of exposure of the plate the breath was held, because the act of breathing was sufficient to produce a movement of the eye. In order to illuminate the general surface of the eye during the time the plate was exposed two thirty candle power lamps were placed on the table (Fig. 4).

THE POSTERIOR SURFACE OF THE LENS.

In order to see the image reflected from the posterior surface of the lens a telescope was employed, the telescope of the ophthalmometer being utilized, for convenience, after the removal of the prism,

which produced a double image. A thirty candle-power lamp was placed as close as possible to the tube just below the distal end and secured immovably. The head of the subject was also held immovably by a head rest. A plane mirror, two inches by one inch, had a letter of diamond type pasted on it below the centre and near the left edge, as regarded by the subject. This mirror was supported by the subject in contact with the right half of the objective glass, with the letter of diamond type in the line of the horizontal axis of the tube. Although one half of the end of the tube was covered by the mirror, no difficulty was experienced in obtaining a good view of the image reflected from the posterior surface of the lens. Twenty feet behind and above the head of the subject was hung a Snellen test card, and by tipping the mirror slightly he was able to read, reflected in it, without changing the line of fixation, a letter of the twenty line. When the subject regarded the small letter on the mirror at five inches simultaneous retinoscopy indicated the focus of the eye to be—8.00 D. S. When the letter on the Snellen test card was regarded without change in the position of the mirror, simultaneous retinoscopy indicated that the eye was at rest. At times the letter on the mirror was recognized by the subject when the accommodation was less or more than—8.00 D. S. When this happened, the fact was revealed by the retinoscope. During these changes of focus the observer was unable to note any change in the size or form of the image reflected from the posterior surface of the lens. Several persons have repeated this experiment and confirmed the original observations. Potential sources of error in the experiment were the possibility that the subject might not accommodate accurately, and possible movements of the eye and head. The first was eliminated by the use of the retinoscope, the second by an arrangement of the letter on the mirror and the letter reflected from the Snellen test card in such a way that either could be seen without altering the line of fixation, and the third by the head rest. The experiment was the first of the series described which was successful, the image being obtained without difficulty about three years ago.

IRIS AND FRONT OF THE SCLERA.

Images on the iris and the front of the sclera were obtained by the same technique as was used for the front of the lens (Fig. 1). It was interesting to find that when the angle of the line of light to the eye and the line of fixation was as small as possible, about ten degrees, an image could be obtained on the iris without obtaining one on the cornea or lens. The camera was placed as close as possible to the line of fixation, its axis forming an angle of ten degrees with the line of fixation. The light was placed ten degrees below the horizon, and the line of fixation was directed to the concave mirror just above the upper edge of the condenser.

PART III.

RESULTS.

Although precautions were taken to prevent any movement of the head of the subject during the time the pictures were being taken, or while the images were being studied by the observer, and the

subject even refrained from breathing for the five or ten seconds during which the plate was exposed, photographs usually showed, in addition to changes of size, manifest changes in the location of the images and changes in the exposed parts of the eyeball. This is what would be expected as the result of an elongation of the eyeball during the production of myopic or hypermetropic refraction. In many of the photographs it seemed that the diameter of the iris was increased or diminished. In some cases a larger or a smaller area of sclera was exposed. A protrusion or a recession of the eyeball often occurred. However, it should be emphasized that in spite of changes in the location of the image before and after changes of refraction, the changes in its size were always what one would expect under the circumstances.

Lens.—Images reflected from the front (Fig. 5) and back of the lens showed no change in size during accommodation.

Front of the sclera.—Images reflected from the front of the sclera (Fig. 6) always showed marked changes when the refraction was changed, no matter whether the line of fixation was ten or ninety degrees from the light. When an effort was made to see, unsuccessfully, at a distance, simultaneous retinoscopy always indicated myopic refraction and the image always became smaller than when the eye was at rest, indicating that the front of the sclera had become more convex. The change was greater than those occurring under similar conditions with images reflected from other parts of the eye. During accommodation of 3.00 D., 6.00 D., or 8.00 D., measured by the retinoscope, the image became relatively much smaller than did images reflected from other parts of the eye when a similar change of refraction took place. Similarly, when hypermetropic refraction of 2.00 D., or more, was produced by an unsuccessful effort to see near, the image became relatively much larger than images reflected from other parts of the eye when the same degree of hypermetropic refraction was produced. The most marked changes in the shape of the eyeball obtained during these experiments were manifested by the front of the sclera, the changes in the size of the images reflected from the side of the sclera, the cornea, and the iris being so slight that sometimes they were scarcely apparent in the photographs, although they were always plainly apparent to the subject when magnified in the concave mirror, and could also be seen by the observer without the mirror.

Side of the sclera.—The changes observed in the images reflected from the side of the sclera (Fig. 7) were exactly the opposite of those noted on the front of the sclera, being larger where the former were smaller and vice versa. When an effort was made to see at a distance the image reflected from the side of the sclera was larger than the image obtained when the eye was at rest, indicating a flattening of the side of the sclera, a condition which one would expect when the eyeball was elongated. The image obtained during normal accommodation was also larger than when the eye was at rest, indicating again a flattening of the side of the sclera. The image obtained, however, when an effort to see near was made, was usually smaller

than any of the other images, indicating that the sclera had become more convex at the side, a condition which one would expect when the eyeball was shortened, as in hypermetropia. The changes of the images on the side of the sclera were not so marked as those on the front of the sclera, but the alterations in size were always sufficient to be readily recognized by the subject in the concave mirror, and by the observer without the mirror. They could be observed when the angle of the line of fixation to the line of the light to the eye was sixty degrees, or even less. * The photographs usually showed changes, but to a less marked degree because, owing to the difficulty of photographing a white image on a white background, they were imperfect.

The cornea.—When the images reflected from the cornea were small no change in size was observed under varying conditions of refraction. When the images were large (Fig. 8) a series of slight changes similar to those noted on the front of the sclera could be observed. The change in the curvature of the cornea during accommodation is so slight that the ophthalmometer, with its small image, fails to show it, and has therefore been supposed to demonstrate that the cornea did not change during accommodation. The method described accomplishes what the ophthalmometer, has failed to do.

The iris.—Images reflected from the iris were more readily obtained than those from the cornea or lens, and slight variations in size were always apparent to the observer and subject when hypermetropic or myopic refraction was produced, but these, however, were not always evident in the photographs.

SUMMARY

These studies of the images reflected from the various parts of the eyeball demonstrate:

The accommodation of the eye is effected by an elongation of the eyeball.

The lens is not a factor in accommodation.

Myopia is produced by a strain to see distant objects.

Hypermetropia is produced by a strain to see near objects.

They have, therefore, confirmed my previous conclusions regarding the mechanism of accommodation, based on experiments on the eyes of animals, and also my earlier conclusions as to the cause of myopia and hypermetropia, based on observations with the retinoscope and published in the *NEW YORK MEDICAL JOURNAL* of March 16, 1912.

40 EAST FORTY-FIRST STREET.

SOME REMARKS CONCERNING THE SMITH-INDIAN INTRAOCULAR OPERATION FOR CATARACT.

BY FRANK ALLPORT, M. D.,
Chicago.

The most important—I might say the most sensational—phase of the cataract subject before ophthalmologists at the present time is that popularly known as the "Smith-Indian" operation, as performed by Major Smith and modified by many surgeons of less experience. This consists in the removal of the lens in its capsule after the method proposed by Major Smith, and, when successful, produces brilliant and ideal results.

The only question for us, as American ophthalmologists, is whether this operation is the best one for us to perform. I will not attempt to speak for others, especially as the Smith enthusiasts seem quite capable of speaking for themselves, but, personally, I do not feel justified in adopting this operation in my own practice. I am just an average operator, and feel if I can get the average percentage of good results by safer methods for patients who come to me for vision and not for experimental surgery, it is my duty to keep to methods I know. I am perfectly willing to acknowledge that Major Smith and a few other East Indian operators of enormous experience, who do many of these operations daily, can do them successfully and achieve brilliant results, but post operative statistics might not be so convincing as the intracapsular operators desire. These poor blind people make cataract pilgrimages to the Smith shrine, are operated and then return as quickly as possible to their distant native hills, and are never seen or heard from again, thus rendering accurate statistics impossible. Admitting the claims of Smith and his followers, there are still other phases of the controversy to settle. First, I doubt very much if Major Smith himself could come to America and produce as good results as he does in India. Of course, this is merely an opinion, maybe a wrong one, but I believe it is rational. Smith's patients in India are tractable, patient, obedient, unpoisoned by stimulants and excessive rich food. Quick healing and slight reaction should be the rule under these circumstances. Should Smith, however, come to America he would be confronted by an entirely different class. He would operate on a large number of unmanageable, impatient, nervous, disobedient, opinionated people, accustomed to servility from others, whose bodies have grown fat, flabby and diseased by laziness, gluttony, drink, autointoxication, syphilis, etc., and with whom slow healing and considerable reaction may be reasonably expected. If this be true, then these operators of less experience than Smith will surely get even poorer results. On account of his natural skill and immense and unprecedented experience, Smith has acquired cleverness and dexterity unequalled by any living man. He can do things no one else can do; he can meet emergencies better than any cataract operator in the world. The intracapsular operation to him is mere child's play, but, while an easy procedure for him, with his thousands of cases a year, it is a difficult and extra hazardous

Celluloid in Correction of Nasal Deformities.—G. B. New (*Journal A. M. A.*, April 6, 1918) records the results of several experiments on dogs, and a number of human cases in which perforated sheet celluloid was used to replace a bone or cartilage transplant. The results showed the material to be highly suited for the purpose of correcting nasal deformities, and its use avoided the often material distress caused by the removal of a bone transplant. The material remained in the tissues without irritation and without change.

operation for such people as myself, for instance, who have never exceeded fifty senile cataract operations in a year. Its advocates here will say, in refutation of these statements, that these are not the real reasons for their allegiance; that they operate on account of the clear pupil, the absence of lenticular and capsular remnants, the lack of iritis, and the superior vision. This may be, and doubtless is true in successful cases; but what of the unsuccessful, where collapsed and ruined eyeballs follow in the wake of the ambitious, but perhaps unwise operator? "The greatest good to the greatest number" should be the motto of all cataract operators, and I am sure that this cannot be attained in this country by the Smith-Indian operation. Some intracapsular operation may be, and I believe will be devised, that will be suitable for average operators, but the Smith-Indian operation is not the one. It is a complicated, difficult and dangerous surgical procedure, except in the hands of a few men like Smith and other East Indian surgeons—and even their hands might lose their cunning unless they were kept in constant practice. I believe that those surgeons in East India, whose stock of cataracts seems to be inexhaustible, are warranted in performing this operation because they operate many times a day and acquire and maintain a special skill and dexterity, but I do not believe that men in this country, who only operate a few cases a year, should unnecessarily risk vision and the happiness of patients, who confide themselves to their care, because they, for one reason or another, are determined to risk the Smith-Indian procedure. These gentlemen who have acquired operative advantages over those who remained at home, by making enterprising journeys to the East Indian Fountain Head of Intracapsulology, and have acquired first hand knowledge on this subject, fortified by experimental operating on several hundred unfortunate blind East Indians, seem to have at least temporarily, regarded this operation as the only one to perform. But it has been observed that those enthusiastic returning cataract pilgrims have mostly—one by one—begun by making various modifications of the Smith operation and its special instruments, and ended by using this operation only in "selected cases"—whatever that may mean. I suspect, however, it means that having once left the "Mysterious East," the personal magnetism of Smith and the fascinations of his surroundings, and once more returned to the commonplaceness of America, the inspiration of the master has faded gradually away. They have, I fancy, learned quite early that this is an operation requiring constant experience, and that, whereas in India the supply of cataracts is more than equal to the demand, in America even a busy ophthalmologist may not operate on more than fifty senile cataracts a year. I think, we might be better occupied in perfecting the quite satisfactory operation with which we are already familiar, and in reaching out along more conservative lines for the future intracapsular operation than in doing an experimental, difficult surgical procedure simply because Smith and a few of his followers do it or because some men are doing it in this country.

7 WEST MADISON STREET.

THE ORGANISM CAUSING POLIOMYELITIS, AND HOW THE DISEASE PROBABLY SPREADS.

By HORACE GREGLEY, M. D.,
Brooklyn, N. Y.

Many early investigators into the cause of epidemic infantile paralysis reported having found organisms varying in form from cocci to bacilli in the nerve centre lesions, and various experiments were conducted to determine the relationship of the bacteria isolated to the disease. Most prominent, in recent years in this country, was the work of Flexner and Noguchi, in which "globoid bodies" were cultivated in the serum-fresh tissue media said to have been first employed in bacteriology by Tarozzi. By this method the surface of the media in the culture tube was covered with a layer of liquid paraffine with the object of excluding the oxygen of the atmosphere from access to the medium. Wolf has shown (*Lancet*, 1917, page 789) that the liquid paraffine layer has a greater affinity for atmospheric oxygen than the culture media and therefore it could not act as supposed. As is well known these experimenters reproduced the disease in monkeys by the inoculation of such cultures. Others had reported a like reproduction of the malady.

Rosenow and others grew the organism in a coccus form, on ordinary nutrient agar to which a little fresh blood had been added before congelation, and likewise reproduced the malady. Rosenow's earlier publications inferred that he regarded the disease as produced by an ordinary streptococcus which, like the cocci, he seems to have proved cause various forms of arthritis; he supposed they had developed special affinity for the nerve centres. Apparently it was with this understanding that a series of experiments were done last year in the Rockefeller Institute to prove that ordinary streptococci could not be the cause of poliomyelitis.

During the epidemic in this city, in 1916, the author carried out some bacteriological and serological work, the results of which, although published extensively at the time, have recently become of particular interest since they have been confirmed by Doctor Rosenow and Dr. L. D. Bristol, the latter working with cultures obtained from the Rockefeller Institute.

The net result of the author's experiments were that, working with cultures taken from the spinal cords and brains of victims of the 1916 outbreak, he isolated in pure cultures a bacillus which could be grown both under the "globoid body" form of the Rockefeller Institute and the coccus form of Doctor Rosenow. Furthermore, two cultures in coccus form supplied by Doctor Rosenow at the time, to the author, were developed into the bacillus form.

The characteristics of the poliomyelitis bacillus as described by the author are briefly as follows:

Form and cultivation.—If cultures, in media consisting entirely or mainly of serum, be made from the infected nerve centres of cases of poliomyelitis, the organisms will develop as "globoid" or coccoid in form, and many of the individuals will be very

minute.

Cultures, either direct from pathologic material or replants of "globoid" or coccoid cultures, in fluid media in which the serum content was small (the media employed was mainly bouillon containing ten per cent. limewater) or on solidified Loeffler's medium (such as is used for diphtheria bacilli)

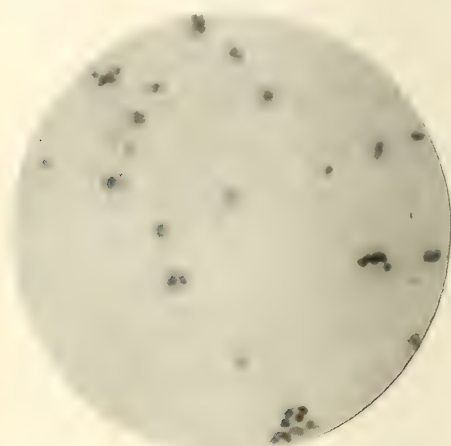


FIG. 1.—Poliomyelitis bacillus, globoid body form. Magnification 1500.

flushed with the limewater bouillon, developed bacillus forms. These bacillus forms could be grown as small Gram negative rods or, by care in fostering particularly vigorous growth (see original paper) be developed into large bipolarly Gram positive bacilli. These latter go through the process called spore formation; in liquid media they develop motility due to a single terminal flagellum.

A "filter passer."—As in all cultures of the organism there are some minute individuals, the fact that it is uniformly a filter passer is easily reconciled with the development of the rather large bacilli which cultures may be caused to produce. Thus it is evident that filter passing alone is no proof that the cause of any disease is too minute to be easily seen by the ordinary bacteriological microscope, nor even is it a good measure of the average size of the organism in question. One prominent bacteriologist, when it was first discovered that the infection of poliomyelitis could pass the Berkefeld filter, declared that on this account all work which considered such an organism as a coccus or a bacillus the possible cause of the disease should be "cast aside," at the same time mentioning his own efforts as having "yielded results of an entirely different order." In the author's work, as published, it was shown that cultures in serum, in milk, or in bouillon could be passed through this filter.

Temperature of growth.—In various experiments the author found that the organism grew well at all temperatures between "summer heat" (70° F.) and that of the body. This is of very great importance in explaining the epidemiology of the malady.

Resistance to pasteurization.—In the work referred to I stated that cultures could be readily grown in milk, and that such cultures survived the

pasteurization process, *i. e.*, heating to 142°-5° for one half hour. This is also very important in explaining ways in which the disease becomes epidemic.

Animal experiments.—In a small percentage of cases I produced paralysis in experimental animals (by intravenous inoculation)—rabbits, cats, dogs, and guineapigs—with typical nerve centre lesions. In other instances dogs and cats, inoculated as mentioned, developed all the symptoms of distemper.

A colt, being used to produce antipoliomyelitis serum, and subjected to intravenous inoculation with cultures of the bacillus, became suddenly ill and died with what would popularly be called "blind staggers." (Details of this interesting case are shortly to be published.)

Symptoms of an abortive attack of poliomyelitis were produced in the experimenter through the accidental inoculation of a culture into his eye. And mucus taken from his throat at this time produced paralysis in a rabbit (by direct intracerebral inoculation) and a contagious, fatal disease, with nerve centre lesions, among guineapigs, the first guineapig having been intraperitoneally injected with a bit of mucus from the same source.

Serological tests.—Six cultures of poliomyelitis bacilli, from as many different sources, were tested for agglutination with blood from forty-four convalescents and six acutely ill from poliomyelitis. Thirty-seven of the fifty blood specimens completely agglutinated, twenty-six in (1-10 dilution; eleven in 1-40 dilution) one or more of the cultures, while thirteen specimens failed to agglutinate any one. All the specimens from the acute cases were among the latter.

Antipoliomyelitis serum.—An antipoliomyelitis bacillus serum was made in cats which agglutinated

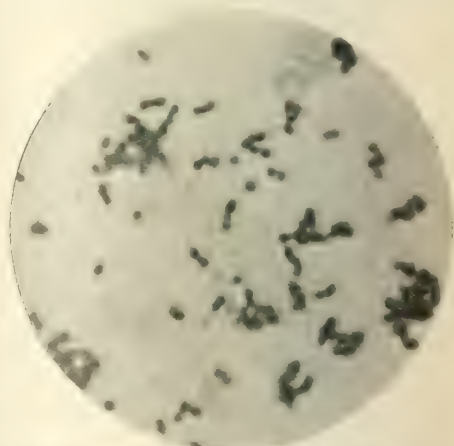


FIG. 2.—Poliomyelitis bacillus, streptococcus form. Magnification 1500.

the culture used in effecting its production in a dilution of 1-600, while it only agglutinated four of the six cultures in dilutions of, respectively, 1-80, 1-40, 1-20, 1-10; it failed to agglutinate the remaining one of the six in the greatest strength tested

(1-10). As this serum was tested on a patient, apparently with good effect, an effort was made to develop a similar serum in the horse. One agglutinating in a dilution of 1-1,600 has been produced, and, at present, opportunities for clinical testing are awaited.

Distemper bacillus compared.—The organism recognized as causing distemper in cats and dogs, and sometimes called the bacillus bronchosepticus, varies similarly in its forms and manner of growth, as I found by testing a culture obtained from a sick dog. The specific antipoliomyelitis serum agglutinated it in a dilution as great as 1-40, while the control (normal animal's blood) required 1-10 or greater strength. Blood from eleven poliomyelitis convalescents was tested with a culture of the distemper bacillus: two specimens agglutinated it in a strength

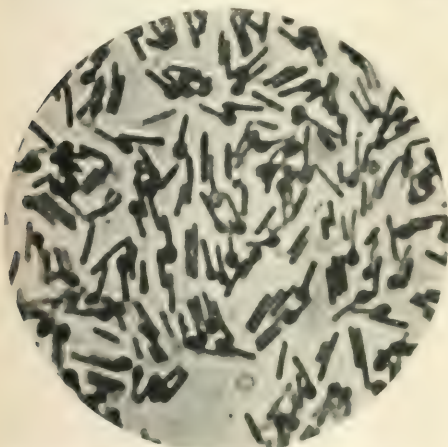


FIG. 1.—Poliomyelitis bacillus, spotulating form. Magnification 1,000.

of 1-40, one in 1-20, five in 1-10, and three did not do so at all (1-10 dilution).

EPIDEMIOLOGY.

Temperature.—Poliomyelitis is almost exclusively epidemic in warm weather. This fact has been largely responsible for the many suppositions as regards special insect carriers that have been advanced to account for the spread of the disease—suppositions which now, however, are seen to be unnecessary.

As a graphic illustration of the effect of atmospheric temperature upon an epidemic, there is nothing more instructive than the variation in case incidence observed during our 1916 epidemic as the thermometer rose and fell—particularly as it passed and repassed 70° F., the point above which I found the organism grew well as a saprophyte.

Month.	Mean Temperature.	Cases.
May.	59.3° F.	29
June.	64.2° F.	756
July.	73.8° F.	3803
August.	73.6° F.	3300
September.	66.6° F.	780
October.	57.2° F.	193

Poliomyelitis in animals.—I have quoted at some length, elsewhere, literature showing the prevalence

of coincident paralytic affections among the lower animals, but as such references are lengthy and are fairly well known, I will confine myself to a summary of an outbreak of paralysis among dogs (1) in Jamaica, Queen's Borough, which came to notice in the spring of 1917—just following our city epidemic of human poliomyelitis.

In this epizootic the dogs were hardly noticeably ill before the onset of the paralytic symptoms, in fact the sickness in every respect was like poliomyelitis among children. Paralysis began with one or both of the hind legs and extended, involving bowels, bladder, sometimes the forelegs, body and throat muscles. Fever, up to 102°, was usually present. Of seven dogs under observation, three were carefully autopsied and cultures made from brains and cords. The cord lesions in these dogs were identical with those to be found in connection with the human disease.

From the cases cultured a bacillus was isolated which reproduced the disease and which could not be differentiated from the human poliomyelitis bacillus, and the bacillus causing distemper in dogs—a disease which is well known to often show paralytic symptoms.

Distemper in domestic animals.—Textbooks of veterinary science, and recent literature, stated that most of the domestic animals suffer from what is usually called distemper, an infectious process due to organisms, of which Besson writes: "As Nocard held, the organisms isolated from different animal species must be regarded as varieties of the same bacillus, and the conclusion arrived at is, in short, this: that there is one pasteurilla (name given to the group), which can pass from one animal species to another, and which by adaptation in one species can produce a disease peculiar to that species."

Milk a probable vehicle for poliomyelitis infection.—The fact that ninety per cent. of all cases of poliomyelitis are in children under ten years of age and that very few of these ninety per cent. are under one, and therefore, of nursing age, is interesting. In our 1916 epidemic only eleven per cent. of the more than 9,000 cases were under one year of age, while eighty-four per cent. were between one and ten. From the above age incidence one easily concludes that ninety per cent. of all cases of poliomyelitis have been habitual drinkers of cow's milk.

I have shown that the organism causing poliomyelitis can cause contagious disease in the lower animals, that it is undoubtedly identical with the bacillus of distemper (pasteurellosis) to which most domestic animals, including the cow, are known to be subject. Further, that it grows readily in milk at room temperatures and that it is not killed by pasteurization. Thus if we could clearly explain how it reached a portion of a community's milk supply, the modus operandi of epidemics would be quite clear. In this connection attention is called to a report by Dingman (2) of several cases of poliomyelitis which he thought due to infection carried in milk from a farm, where there was a case of poliomyelitis in the farmer's family.

As a rule only young animals are found to suffer from distemper, and the adult dog is practically immune. We know from experience with human diseases, such as diphtheria and typhoid, that indi-

viduals may harbor infections and show scant or no symptoms, and that such "carrier" conditions are extremely important in the spread of infectious disease.

Even in human poliomyelitis many abortive (without paralysis) cases have been reported and survival of the virus in the nasopharyngeal mucus for several months has been demonstrated.

Of the extent and varied manifestations of pasteurellosis among bovines not much is known; Besson says:

The disease sometimes takes the form of an acute hemorrhagic septicæmia, sometimes it is more chronic and accompanied by pulmonary localizations. Oreste and Armanni found an identical microorganism in an epizootic disease of buffaloes, and numerous investigators have since described similar epizootics in which the same organism was found (Galtier, Billings, Smith, Nocard, Piot-Bey, and others). In the Argentine, Lignieres observed various clinical forms (acute enteritis, pleuropneumonia and hemorrhagic septicæmia) of an epizootic disease caused by one and the same microorganism which was indistinguishable from the foregoing.

Cows are well known to be subject to frequent febrile disturbances, evidently of infectious origin and, being subject to distemper infection, it requires no great stretch of the imagination to understand how a wave of bovine infection, which need only affect a cow here and there, could result in the distribution of enough of the bacilli to cause epidemics of poliomyelitis among children, especially when the weather or room temperature to which the household supply of milk was subjected was high enough to permit multiplication of any infection contained therein.

As a saprophyte in general.—Now, as shown, the poliomyelitis bacillus is capable of saprophytic existence, and, therefore, could undoubtedly grow in many food substances. Pearson supposed that an outbreak of poliomyelitis among Eskimo dogs, which he reported, might have arisen from the semiputrid fish which, at the time, formed their sole diet.

There is a curious statement in the literature, on poliomyelitis in Australia, to the effect that the district in which the disease first appeared in that country was that in which "phosphate" had just been used extensively, and for the first time, as a fertilizer.

Direct transmission.—As to whether direct contagion from one person to another is an important factor in the spread of poliomyelitis, I think it may be said that it is not, since it is well recognized that cases do not develop in the way which such a supposition would entail. In the City Department of Health's report on the 1916 epidemic, of the 8,635 families in which poliomyelitis developed, 8,287 (ninety-six per cent.) had one case only, although the total number of children in these families amounted to 24,883. The report states: "The investigation showed that, in nearly all instances where more than one case occurred in a family, the onsets were so close as to suggest simultaneous infection (3).

CONCLUSIONS.

"It is demonstrated that the organism isolated from the nerve centres of cases of poliomyelitis (including the "streptococcus" described by various observers) is a pleomorphic bacillus of the distemper

group, which varies in characteristics much as the various, supposedly different, members of the group do from one another."

"It seems very probable that, while contact cases of poliomyelitis may occur, either by direct transmission of the germ from animal to man, or from man to man, the great mass of cases which comprise epidemics are caused by milk borne contagion" (4).

Doctor Rosenow (5) now states that he finds that his "streptococcus" will produce the bacillus form, and Doctor Bristol (6) working with one of Flexner's cultures, obtained from the Rockefeller Institute, developed from the "globoid bodies" bacilli such as I described. Bristol concludes: "From these studies I venture to suggest the possibility that the organism of poliomyelitis is a pleomorphic bacillus (often indistinguishable however, from a true coccus), and that it may be closely related to the large group of so called bipolar bacilli, or pasteur-ella."

"Based on this assumption, the mode of spread may be considered analogous to that demonstrated for all forms of pasteurellosis in animals, namely: directly, by contact with the secretions or excretions of an infected individual (either diseased or a healthy "carrier"); indirectly, by the carriage of the specific organisms by insects, or possibly in dust, uncooked food, or drink."

This is practically the same conclusion which I advanced some six months previously.

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RELATION OF INDUSTRIAL HYGIENE TO GENERAL PRACTICE.*

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No matter how greatly machinery is improved by the inventions of our mechanical experts, the guiding human hand remains indispensable to its proper operation. And yet, while no end of expense is incurred by factory owners in the maintenance and repair of machinery, their efforts and expenditures to conserve the strength and lives of the workers upon whose creative powers their wealth and welfare as that of the nation depend, have been absurdly trivial. In making this indictment we leave out of the reckoning all purely sentimental and humanitarian considerations, and view it merely from the economic standpoint as evidence that there is less regard for the human factor in industrial management than there is for machinery and equipment.

Paradoxically, war, which is destructive of human life, has done much to awaken the country at large, and business men in particular, to the immediate necessity of conserving and guarding the lives and health of the industrial army. Splendid, wise and

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humane as the efforts of civilized nations have been in recent years, in reducing infant mortality, the work must not stop at this point. What is just as urgent and requires quite as much emphasis is that those who survive the dangers that threaten infancy and childhood be protected by organized effort against the dangers that continue to loom up in the shop, factory, the home and the social environment.

There is something so dry and forbidding about statistics, although in theory their purpose is to illuminate and clarify facts, that one fears to repel interest by the citation of figures, and yet, properly interpreted, these statistics imply large possibilities in the reorganization of medical practice, and in some measure give one a conception of the magnitude of the problem. The Federal census of manufactures for 1914 showed that there were a little more than 48,000 factories and 30,000 mercantile establishments in the State of New York, exclusive of home tenements in which factory work was being done. Over sixty-two per cent. of all these establishments are situated in the City of New York. In these factories there are hazards from chemical poisoning, from dust, extremes of atmospheric pressure and temperature, infections and many things besides, which are scarcely, if at all, mentioned in medical text books. The industrial population of this State is roughly estimated at 3,000,000. Bearing in mind the enormous number of factories and factory workers which these statistics indicate, a number which has undoubtedly been very considerably increased in the last three years, it is amazing to find that less than 100 factories and mercantile establishments of the total of more than 78,000 had any substantial welfare organization, at as recent a date as October, 1917, according to records furnished by the National Civic Federation.

Of the scant number of industrial organizations which have given recognition to the business wisdom of caring for their workers, less than a dozen establishments in this State employ physicians to furnish medical supervision. The remainder are largely dependent upon nurses, social welfare workers and here and there a minister of the Gospel to carry on what is commonly known as welfare work. That there may be no confusion, it should here be stated that this list does not include factories which have entered into arrangements with physicians to give emergency surgical care to those who may be accidentally injured. Such an arrangement does not constitute what may properly be called medical welfare work. It is, in reality, a substitute for the hospital ambulance service. By medical welfare work, or, to use a term which is less subject to abuse, by industrial medical supervision for factories, is meant a system of organization which has in view the periodic medical examination of employees, and the provision of medical and surgical care to prevent serious illness, as well as the care of those who may be injured.

A few years ago it was accepted as one of the unavoidable accompaniments of business management that there should be an endless stream of new employees going into and out of the factories, representing a hiring and firing system which was economically wasteful and in large measure preventable.

The experience of Doctor Marquis, physician in charge of the Ford Automobile Company works, is extremely interesting in this connection. In 1914 this constant ebb and flow, or the "labor turnover," as it is called, was fifty-six per cent. In other words, at the end of that year only forty-four per cent. of the old employees had remained in service. By a system of preliminary medical examination, coupled with a scientific inquiry into the mental, physical, social and personal characteristics of employees who applied for jobs, as well as through wage adjustments, this labor turnover was reduced in one year to something like fourteen per cent. The medical examinations contributed in no small measure to this result, focusing attention upon those who ought to be manifestly disqualified because of physical defects and infirmities, the latter were weeded out before they had a chance to enter the company's employ, thus preventing financial and physical loss to themselves and to the company. This weeding out of the unfit because of mental or physical defects was in no small degree the means of reducing the great number of accidents which have usually been regarded as a natural accompaniment of industry. Many far more striking instances of a reduction in labor turnover, as much as from two to five hundred per cent. could be cited.

WHAT IS TRUE MEDICAL WELFARE WORK?

In many of the companies which boast of their system of welfare work, emphasis has been falsely placed upon elaborate surgical room equipment and nursing service, which are available only in case of accident. The doctor in these instances is subject to call, or makes periodic visits to the establishment, generally, exclusively with a view to protecting the company's interests so as to prevent suits for accidental injuries.

The proper function of doctor and nurse in any large industrial establishment is to serve the factory management as a staff or advisory officer with a view to eliminating in every department of the factory those conditions which insidiously undermine health or are sources of danger. In other words, the doctor, instead of being content to visit the place merely to conduct a dispensary service and to render first aid, must be qualified, by proper study and preparation, to examine every branch of the industry, to know the composition and nature of the chemicals which are employed, their possible effects upon health; and he must possess knowledge that will enable him readily to detect those conditions with respect to ventilation, lighting, temperature, muscular, nervous and mental fatigue, and numerous other factors, which constitute the true field of industrial hygienic study. He must occupy in the organization of the industrial establishment very much the same place that a member of the medical corps of the United States Army does with respect to camp sanitation, and the prevention of disease; with this very important distinction, however, that he should possess authority coordinate with that of other supervising officers of the company to put into effect all practicable measures for the protection of the workers. Above all things, he must not wait for a call when an employee is overpowered or

desperately ill from the effects of such poisons as dinitrobenzol, trinitrotoluol, aniline, carbonmonoxide, mercury, arsenic, lead, and a host of others.

Illustrations of occupational disease conditions.—Multiplied instances might be cited of occupational diseases contracted by workers in this city during the last three years. A few will suffice to suggest lost opportunities for the conservation of human power and wealth. Recently, a factory manufacturing flashlights under contract with the government experienced trouble in retaining in its employ a group of girls who were employed at buffing wheels to smooth off certain parts that had been painted with an enamel of unknown composition.

The attention of the Health Department was called to this case by a report of a case of lead poisoning by a private physician. The patient, a girl, informed us that three other girls had also become ill at about the same time that she began to experience abdominal colic, headache, nausea, and weakness in the arms. One of these girls was admitted to one of the large hospitals in the City of New York, and, because she was delirious and suffering from convulsive seizures for which no apparent cause could be found, her case was diagnosed as one of hysteria. She was treated for this until the medical inspector who knew of her association with the first case suggested the possibility of lead encephalopathy. Acting upon this hint, the attending physician discovered a number of confirmatory signs of lead poisoning and it became apparent that lead encephalopathy, a condition particularly frequent among women exposed to lead poisoning, was the cause of the maniacal and convulsive seizures. Another of the girls who had become ill was found to have been admitted to one of the well known hospitals in the city where, because of her severe abdominal pain, her appendix was removed; the latter was found to be normal. The medical inspector, acting upon her knowledge of the occupational background, and the association with other cases of lead poisoning, made an examination through the courtesy of the hospital authorities and suggested that lead poisoning was responsible for the condition. Subsequent clinical findings confirmed this diagnosis. A fourth girl, working in the same factory department, was found to be under the care of another private physician for the treatment of plumbism. Through the courtesy of the private physician who reported the first case, an inspector of the Division of Industrial Hygiene elicited an occupational history from the first patient and learned that, for some time, a fairly large squad of girls had been working close together, all of them using buffing machines for smoothing down the enameled surfaces of certain parts. She said that a large amount of dust was created in this process and that the girls generally experienced great thirst while at work, so that each of them kept a bottle of water beside them on their work table, with a glass inverted over the top as a cover. With this they slaked their thirst at frequent intervals. They wore no protective clothing, had no washing facilities, and ate their lunches at their work bench without washing their hands or rinsing their mouths. Only a half hour was allowed for lunch.

An analysis of the enamel that was used in painting the parts on which these girls worked, at the Department of Health Chemical Laboratory, showed that it contained lead in large quantity. This information, transmitted to the officials of the factory, caused them great surprise as they had not even suspected the presence of lead. As a result of persuasion, the manager lengthened the lunch period sufficiently to allow each girl an opportunity to wash before eating. Hot water was supplied, and also soap and brushes. Protective clothing was furnished to the girls to prevent their carrying lead dust upon their clothes to their homes, and what was even more to the point, an exhaust fan with ducts that were connected with the buffing machines was installed to carry the lead dust generated in the process of buffing into the pipes, and to prevent such dust from contaminating the air of the workroom. Finally, these girls who were generating lead dust were partitioned off from other workers in the factory.

Another instance is also of interest. In a chemical dye factory in the City of New York, a number of cases of severe poisoning by various chemical agents handled by the workers, aniline poisoning in particular, have occurred from time to time, and although this company employs a physician to exercise general health supervision over its employees, those cases of poisoning which have come to light have, with but one or two exceptions, been reported by outside physicians or by hospitals in the neighborhood. Industries which are essential to the welfare of the country must be encouraged, but such support and encouragement which they receive need not conflict with the welfare of those who furnish the sinews and power. It is no lack of generosity toward this particular factory physician to say that he has apparently not been alive to a sense of his moral obligation to report cases of serious occupational disease to the Department of Health, and that he has signally failed to exercise influence to abate the dangers which surround those who are employed in this hazardous occupation, since serious cases of aniline poisoning still come to our attention at intervals.

Instances of a similar character could be many times multiplied. When this field of work is developed as it should be, and when doctors assume leadership in demonstrating to manufacturers, to workers, and to their medical confrères the extreme value of this work in promoting community welfare, the development of industrial medicine will be greatly helped, and medical science will be greatly enriched by their studies and observations. Space does not allow more than passing mention of interesting types of cases which come to our notice, such as brass or spelter chills which simulate malarial attacks, or of "bends" (caisson disease), anthrax, arsenic, mercury, and lead poisoning, and others which are reported to the Health Department, or ferreted out by the inspectors of the Division of Industrial Hygiene. The history of recent decisions on questions affecting the welfare of laboring people, as rendered by the United States Supreme Court, indicates with what great respect the highest judicial tribunal of the country will heed the counsel

of inedical men, when based on careful study and investigation. Medical men doing scientific work in industrial hygiene as well as in other special fields give an impetus to a great variety of social and legislative activities which contribute to promote human welfare. This plea is intended to win a larger measure of respect for industrial hygiene which is the most recent addition to the family of medical sciences, and to secure for it the opportunity of a hearing in the schools of medicine, and also to indicate how it may serve as another powerful link that joins medical science and medical practitioners in the effort everywhere apparent to secure human welfare.

A PLAN OF ORGANIZATION FOR PREVENTIVE INDUSTRIAL MEDICINE.

Generally speaking, the practising physicians of the City of New York have been slow to appreciate the great headway which industrial hygiene has been making in attracting the attention of the owners and managers of large industrial organizations throughout the country. While this interest in industrial hygiene has not been manifest in New York City to any considerable degree, a certain number of medical adventurers have been quick to interpret the spirit of the time, and have organized a variety of medical organizations for commercial exploitation under pretense of offering their services for industrial hygienic supervision to factory owners and to employees. Their method has been a slight modification of the form of medical organizations which, in the past, have offered medical care to individual families under contract for ten or twenty-five cents per week.

Health insurance when it becomes effective will undoubtedly be a stimulus to interest in this work in the City of New York, but the time seems ripe for the organization of reputable medical practitioners into groups who will establish medical service stations in factory districts, and who, prepared by careful study, will be able and willing to serve the needs of the multitude of small manufacturing establishments who could not afford to employ independent medical officers. Medical officers of this character should, in the opinion of the writer, be prepared to give the benefit of their intimate knowledge of sanitary engineering to the owners of small establishments, with a view to eliminating all those environmental conditions and trade processes which conduce to disease or accident. In other words, they should serve as advisers for the prevention of disease and not merely as therapists and surgeons. In addition, these stations should be prepared to receive or treat medically and surgically all cases requiring such treatment, or respond to emergency calls. Local service stations of this character will enable many small establishments to profit through health supervision exactly as some of the foremost of the large establishments do at the present time.

The Division of Industrial Hygiene of the New York City Department of Health is undertaking this work, assuming its attempts will eliminate by the process of law, through education, and by its own researches and investigations, the hazards that threaten the children, women and men.

ENCOURAGE THE OBSCURE CONTRIBUTOR!

By J. VAN BECELAERE, M. D., LL. B.,
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From the *Detroit News*, under date of November 9, 1917, I clip the following, under Idea Launching. "Each of us has it within his power to make this world more wonderful than it is, with all its wonder. Have you ever stopped to think of the wonder back of an idea? The place where you live is the product of an idea. The chair you sit in, the table off which you eat, the shoes you wear, the light by which you read, the train on which you ride, the store where you go to trade—everything about you is the product of an idea that grew. In Japan, which is quite known as the land of flowers, they have a pretty custom of releasing from a cage a number of different birds, as a new ship is launched, significant of the purpose of commerce in going its way to all points of the compass. How much the same with the launching of an idea! Where is it going to end? To what vast purpose may it not be lent? To what length of life may it not live? And wouldn't it be wonderful to feel that every thought, every completed idea, started its way into its kind of eternity advented alongside the letting loose of birds of love, of heart inspiration, of colored courage, of varied helpfulness? You will have ideas today. Everybody will. Launch yours! And start them at early dawn, with the sun upon their wings, the sparkle of health in their eyes, and that strange touch of love in their hearts that alone is able to make an idea *live*."

More than twenty years ago, while visiting at the laboratory of a manufacturing pharmaceutical firm, not a thousand miles from Detroit, I was introduced to two of their chemists, who were, I was told, working on a "peptonate of iron" formula. It struck me at the time, and I gave word to my idea, that it would be vastly preferable to dispense iron in an "already animalized" form, rather than laboriously force an artificial combination. Pressed to explain, I remarked that the slaughter houses were every day turning into the sewers many thousand gallons of blood, and that here, certainly, was a valuable source of "organized" iron going to waste. My suggestion was dismissed as impracticable, and still, within the year, that firm launched a profitable iron preparation—still in the market—embodying my idea, and without even a "thank you" for the suggestion.

Somewhere among my papers lie buried the outlines for an exhaustive study of the various oxytocies, which have never seen the light because of my fear that merely theoretic speculations, unsupported by laboratory studies, would not be welcome to the professional press.

Many years ago I sensed the coming importance of corpus luteum therapy, but—being unknown in physiologic circles, and lacking experimental facilities—I refrained from publishing a mere "hunch," which later was sprung and elaborated with positive advantage to the profession.

Ideas that I have entertained for a while, and discarded—unheralded—in fear of arousing ridicule, antagonism or adverse comment, have later bobbed

up under the pen of another, bolder writer, and found favor with the profession. This experience of mine is, I am sure, a common occurrence, and I am convinced that *that* one of our leading professional publications that would open its columns to the obscure contributor, and welcome for publication under a special caption (for instance: Ideas, Suggestions, etc.) sentences or paragraphs signed perhaps with a "nom de plume" (identified in a sealed envelope forwarded by same mail and filed in rotation) would do much for the garnering of occasional thought nuggets at present submerging forever in the maelstrom of undeserved oblivion. Priority for such ideas could at a later date be claimed on the strength of written evidence filed in the editorial sanctum.

Such an arrangement exists in France, and there is hardly a meeting of any of the Paris scientific societies, the Académie de Médecine especially, at which the secretary does not acknowledge receipt of a sealed communication from Doctor So and So, to be filed away for the present and opened on a specified date.

Many of the profession are unwilling—unable perhaps—to contribute long winded papers to the press, and many good, helpful suggestions are in consequence sidetracked, even definitely lost to the physician. Add to this the rebuffs occasionally suffered by the neophytic writer at the hands of supercilious "publication committees," and apparently no one but a Gorgas, a Mayo, or an Osler seems reasonably sure of editorial recognition.

I realize that among the wealth of literary chaff coming to such a department there might perhaps be no more than an occasional grain of wisdom, and yet, this very one may be the potential kernel from which is apt to spring a prolific growth of profitable medical thought.

400 DIX AVENUE.

Lipovaccines.—E. R. Whitmore and E. A. Fennel (*Journal A. M. A.*, March 30, 1918) describe in detail an improved method of preparing these vaccines. The bacteria are grown on agar in Kolle flasks and the growth is collected in a bottle by means of a vacuum scraper, thus avoiding the addition of fluid. The growth is then transferred to Petri dishes and dried at once in vacuo and while frozen. This yields a flakey mass which crumbles to a fine powder. The lanolin, lecithin, and olive or sweet almond oil are sterilized in the autoclave for fifteen minutes under fifteen pounds of pressure. The bacterial mass is next transferred to a large bottle and ground with steel balls for forty-eight hours when enough lanolin to make ten per cent. in the finished product is added and grinding continued for twenty-four hours. The oil is then added and the whole mixture ground for another twenty-four hours. The final product is then heated on a water-bath at 53° C. for one hour. Trials on man and animals show that man can be given a single dose of such a vaccine containing 3,000 million Shiga, 3,200 million "Y," and 2,200 million Flexner dysentery organisms with no marked local or general reactions and agglutinins, precipitins and bacteriolysins are produced by the injection.

GALLSTONES.

History, Diagnosis, and Medical Treatment.

By SAMUEL WEISS, M.D.,
New York.

Naunyn's treatise on gallstones, translated for the New Sydenham Society and published in 1896, is one of the ablest and most scientific works that has ever been written concerning any disease. Mayo Robson, Kehr, and others who have had large experience in the surgical treatment of gallstones, have also written voluminously on diseases of the gallbladder and bile ducts. Of the making of books, reporting of cases, and writing of articles on this subject, there is no end. My reasons for writing on a subject on which others have already so ably written are as follows: A careful and painstaking examination of many sufferers has forced me to certain conclusions not in accordance with those of Mayo Robson, Kehr, and other writers. So brilliant have been the achievements of gallstone surgeons, so much has been written on the surgical aspect of the subject, that it seems to be forgotten that this is a disease specially amenable to medical treatment; and if medical and hygienic means adapted to the requirements of each individual were resorted to early enough in the course of the disease, in very few cases indeed need the question ever arise as to whether the patient should submit to the brilliant, yet often dangerous and even fatal remedies of the gallstone surgeon. In my experience nearly all who suffer from gallstones get relief sooner or later without operation. I learn also from the records of the surgeons themselves, viz., that operation by no means always procures permanent freedom from the symptoms of this disease. Before entering on a somewhat systematic discussion of the subject, I shall mention three considerations that I believe should be well weighed before any medical man advises a patient to submit to operation.

1. Winiwarter, a German surgeon, said that the diagnosis of gallstones is sufficient indication for operation. This is exceptional. There are few medical men or surgeons who would suggest that every individual who has gallstones in the gallbladder or bile ducts, ought to undergo operation to have them removed. Postmortem records abundantly show that the presence of gallstones is not inconsistent with long life, and they have been found in large numbers in the gallbladders of those who have never during life suffered any pain or discomfort that led even to a suspicion of their existence. In 1,150 postmortem examinations made at Strassburg, Schroeder found gallstones in the gallbladder and bile ducts of 141, or 12.26 per cent. In 742 postmortems made at Manchester, Brockbank found gallstones in 49, or 6.6 per cent. If every individual in whose gallbladder or bile ducts are gallstones suffered the agonies of biliary colic, peace on earth would be impossible. So sudden and severe are the attacks that seldom would there be a gathering in church, theatre, or music hall undisturbed by the groans of the sufferers. Happily, when the stones do not migrate nor set up inflammation, there is no need for interference, and from this it follows that if by medical means the stones can be kept at rest

and inflammation prevented, surgical treatment is unnecessary.

2. Medical and hygienic remedies can claim a vastly larger proportion of cures than surgical. What proportion of those who have gallstones ever actually suffer it is exceedingly difficult to estimate. Many of the patients seen in ordinary practice have only slight and transient attacks. Medical men in Carlsbad, to which many resort who suffer from the disease in an aggravated form, say they very seldom have a fatal case and send very few to the surgeon. Operation I certainly believe to be the best treatment in a limited number of cases, but a comparison of a number of patients who have not undergone operation with cases of a similar type on whom operation has been performed will probably show that the mortality among those who have been left to *vis medicatrix nature* is considerably less than those who have undergone operation.

3. When in any individual case the question of operation is discussed, the argument is generally advanced in its favor that though the mortality be comparatively high, the relief given is more rapid than by any other means and the cure more likely to be complete. As regards relief being more quickly obtained by surgical than other means, it is true that many patients are able to leave the hospital in a few weeks, but I have not yet seen any one who has undergone a severe operation restored to the average strength and energy within a few months while the effect on the constitution is generally felt for a lifetime. To this, however, many patients who have suffered for a long period would readily submit, provided they could be assured there would be an end to the frequently recurring attacks of agonizing pain. Unfortunately, however, operation provides no absolute safeguard against future attacks. No surgeon has had a larger experience than Kehr, of Halberstadt, nor probably can any one be regarded as his superior in diagnosis or technic. In his *Anleitung zur Erkennung der Diagnostik der einzelnen Formen der Gallensteinkrankheit*, we find the following statement which summarizes a great part of his work: "I have up to April 1, 1899, performed 400 operations on 353 patients suspected of having gallstones or in whom gallstones were actually found to be present." Here we find fifty-six operations more than the number of patients. Allowing for the fact that some may have been operated on oftener than twice, we thus find that fifty in 353, or one in seven, had to undergo operation oftener than once. Some of these operations we find from the list of cases appended were due to the first operation not being complete; others, to a return of the disease. When the gallbladder is merely opened—cholecystotomy—and its contents, gallstones, mucus, or pus, removed, if the condition which led to the formation of the gallstones persists, there seems to be no reason why they should not continue to form. It is well known that after operations of this kind, stones are frequently passed. After the more severe operation of cholecystectomy, with a mortality in the hands of the best surgeons, of five to fifteen per cent., when not only the contents but the entire gallbladder is removed, it is true that stones can no longer form in the gallbladder; but this gives no security in their formation in the bile ducts. This is

what happened to several cases in Kehr's experience.

Every medical man must, of course, feel that a great responsibility is incurred when he is called upon to advise his patient to refuse or submit to operation. If the disease has advanced considerably, to decline operation may mean a long period of severe recurring pain with the risk of perforation or serious septic mischief which will in all likelihood sooner or later prove fatal. On the other hand, operation may mean death or only a very temporary relief from the intolerable agony of this disease. It is now more than thirty years ago that Mr. George Brown, a general practitioner of London, operated for gallstones, but it is only within the past fifteen or twenty years that the operation has become familiar to surgeons and medical men. In the early days of its history the successful cases published by Lawson Tait and Mayo Robson aroused great expectations and made a deep impression on medical men as well as the general public. Though these operations have not yet been proved to be without danger nor an absolute safeguard against the recurrence of the symptoms of this disease, yet the belief in the efficacy and advisability of operation in many quarters is so strong that medical men have felt uncomfortable when they could not make up their minds to advise their patients to submit to operation. Considerations such as these should, I think, weigh somewhat with the surgeon who blames the medical man who clearly sees the serious issue involved in operation and does not abandon all hope of relieving the patient or even accomplishing an absolute cure by other means.

Dr. H. B. Anderson (1), of Toronto, admitted that while surgical procedure was frequently the best, and often the only means of offering a chance of relief, its advocacy based on certainty of cure and assurance of nonrecurrence was unwarranted. The main object of treatment was the relief of the infection and inflammation and not merely the removal of the gallstones. This not infrequently occurred under nonoperative treatment, especially, in early and mild cases and particularly after first attacks before serious local damage had been done by the infection. Medical treatment should be fully carried out in all cases where the patient's physical condition did not warrant operation and in the numerous cases in which operation was refused. It should be employed in many cases as a preliminary to operation in order to allow the acute infection to subside as far as possible. It should be carried out in all cases after operation to prevent reinfection and recurrence if possible. He never advised strongly against operation in any case, unless an operation was definitely contraindicated because of the patient's physical condition; but after explaining the possibility of failure and that operation might eventually be required, he did not hesitate in early or mild cases or after first attacks to give medical treatment a thorough trial, and this course in many instances gave excellent results. Doctor Roessel pointed out that gallstone patients were first treated by the physician and by him often referred to the surgeon; the surgeon, however, rarely after operation turned the patient over to the medical man again for subsequent treatment. In Germany it is the custom for the surgeon to turn the

patient over to the physician after operation for medical treatment and care. Instances had occurred where failure to provide this care had been attended with undesirable results.

HISTORY.

Gallstones were first observed in 1565 by Johann Kentmann, of Dresden, who communicated his discovery to Conrad Gessner, to be made use of in his great work on *Fossils*. According to Marcellus Donatus, they were likewise found about the same time by Tournamira and Gentilis. Binivene, Vesalius, and Fallopius examined and described them with great care, so that in 1643 Feruel was able to treat in detail their characters, causes, and symptoms. Glisson also contributed to the history of these concretions. As regards the pathology and diagnosis of gallstones, the work of Friedrich Hoffmann, of Halle, was of far greater importance than any that preceded it. Bianchi and J. B. Morgagni recorded numerous fresh observations which greatly increased the information upon this subject. A similar remark applies to Boerhaave and Van Swieten, and likewise to Sydenham and Sauvages. For the first accurate investigations into the structure of gallstones, we are indebted to Fr. August Walter, who carefully described and figured the rich collection in the museum at Berlin. To this work, the works of Sommering, Prochaska, and especially H. Meckel deserve to be added. The first chemical examination of gallstones originated with Galeatti, but led to no result. It was not until after the discovery of cholesterin that Fourcroy and Thenard succeeded in determining anything certain as to their composition. Bramson, Platner, Hein, Seifert, and Bouisson have been more especially engaged in the chemical analysis of these concretions. As regards the pathology, diagnosis, and treatment of the forms of disease produced by gallstones, it is scarcely possible to review the medical literature. The most important observations have been collected by Fauconneau-Dufresne, in his *Traité de l'affection calculuse du foie et du pancreas*, Paris, 1851. Europeans have found gallstones in from five to ten per cent. of all autopsies; in the East, on the contrary, they are extremely rare, only one or two cases are recorded.

ETIOLOGY.

The formation of gallstones, whether in the ducts or in the gallbladder, may be considered under two heads: 1, immediate or exciting causes; 2, disposing factors.

Immediate or exciting factors.—The immediate cause of the production of calculi is a mild form of catarrhal inflammation of the mucous membrane lining the ducts and gallbladder, leading to an albuminous exudation which, as shown by experimental addition of egg albumen to bile, precipitates bilirubin in chemical combination with calcium as bilirubin calcium calculi (2). This is the only form of calculus actually produced in the bile ducts though under conditions such as impaction of a gallstone in the common duct the formation of additional calculus material containing cholesterin, as well as bilirubin calcium, takes place. Chemical analysis has shown that the vast majority of biliary calculi are composed chiefly of either or both of two

substances, viz., cholesterin and the calcium salts of bile pigment, known as bilirubin calcium. Either of the two substances may be the sole constituent or they may together form the mixed varieties with the two substances in almost any proportion. Certain materials only occasionally enter into the composition of gallstones or do so commonly only in small amounts. These are inorganic calcium salts, notably the carbonate, sulphate, and phosphate; small quantities of copper; traces of iron, zinc, and manganese; globules of mercury; fats; silica; uric acid, and foreign bodies. Of the last the round worm, a portion of *Distoma hepaticum*, a needle, and a plum stone, have each been recorded as being the nucleus of a calculus. The presence of calcium salts in mixed calculi, particularly the carbonate, contributes hardness; in rare instances, the concretions may be chiefly or entirely calcareous. The bile acids and other constituents of bile are found in calculi only in such small traces as are explained by the absorption of this fluid in the interstices. Again, the bile pigment in combination with calcium is not always bilirubin, but frequently in part biliverdin or bilifuscin.

It may be said that in general cholesterin predominates in the larger stones, while the smaller are more apt to contain considerable bilirubin calcium. Naunyn, in his admirable treatise on cholelithiasis, recognizes six classes of gallstones: 1. Pure cholesterin: Usually pure white or yellowish, translucent; in rare instances dark colored; ordinarily, oval or roughly spherical in form, hard, seldom exhibit facets, not stratified or only feebly so, and vary in size from a cherry to a pigeon egg. 2. Laminated cholesterin: Contains ninety per cent. or more of cholesterin, the other constituents being calcium compounds of the bile colors and calcium carbonate, are usually hard, but occasionally when dry, brittle and friable; more frequently faceted than the first variety; more or less distinctly laminated with the layers, perhaps, differing in color; often with those nearer the centre more crystalline in structure and those nearer the surface hardened by the presence of calcium carbonate. They resemble cholesterin stones in form and size, but are not apt to be somewhat darker in color. 3. Common gallstones: These comprise the great bulk of gallstones, varying in size, composition, and form and tint; usually faceted and laminated; the soft nucleus may consist of bilirubin calcium or of a cavity holding a yellowish alkaline liquid. If soft when removed, they harden and shrink in drying without developing fissures. 4. Mixed bilirubin calcium: Usually the size of a cherry, occur in groups of three or four, and are faceted. They are twenty-five per cent. or less cholesterin, the remainder being chiefly bilirubin calcium. They have a brown color, are seldom hard, and develop fissures when they dry. 5. Pure bilirubin calcium: Common in cattle, rare in man. In calculi of this class, bilifuscin is practically always present. 6. Rarer forms: Amorphous and incompletely crystalline cholesterin gravel; small; often resembling pearls, and always with a nucleus of different structure. Calcareous forms consisting almost entirely of calcium carbonate. Concretions which include foreign bodies and conglomerate

stones. Casts of bileducts. Schade divides them into three types, pure cholesterol, bilirubin calcium, and pigment calcium cholesterol.

The stones are usually found within the gallbladder, less frequently in the cystic or common duct and in the alimentary tract, having passed down from the gallbladder. The diagnosis of intrahepatic calculi is not made during life; such calculi occur in 8.3 per cent. of the gallstone cases that come to autopsy. Noguchi reports a case where the stone was not found in the bladder or duct but was felt in the liver at operation and successfully removed. A single calculus may be present in the gallbladder; it is usually ovoid and may be quite large. The number of stones may be very great, 7,802 having been reported in one case. The average size is apt to vary inversely with the number, from that of a pinhead to a cherry, as in my own cases here illustrated. When numerous, they may be the size of small grains, while, on the other hand, Meckel has described a single biliary calculus fifteen centimetres long and six broad. When more than a few are present, they commonly lose their ovoid shape and show signs of mutual pressure, having a polygonal form with smooth facets. All those present in one individual commonly have the same chemical composition and present the same physical characters, but may vary considerably in size.

Simple stagnation and inspissation of bile do not lead to the precipitation of bilirubin calcium calculi. Something more than inspissation, *e. g.*, catarrhal inflammation, is necessary for the formation of these calculi. In catarrhal inflammation of the mucous membrane of the gallbladder there is an abnormal formation and secretion of cholesterol by the mucous cells and glands in its walls. This excessive and pathological production of cholesterol is responsible for the formation of cholesterol calculi. Inflammation of the gallbladder leads to a perverted metabolism inside the mucus secreting cells in its walls, resulting in the formation of cholesterol inside these cells. It was formerly thought that the cholesterol formed elsewhere, especially in the central nervous system, was picked up from the blood, and excreted into the gallbladder, but there is no evidence to support this, since administration of cholesterol to animals under the skin or by mouth, does not increase the amount of cholesterol in the bile.

It will be noticed that the results of catarrh in the small bile ducts and gallbladder differ both in mechanism and in the nature of the calculi produced. As the result of a catarrh in the small intrahepatic ducts, there is a precipitation of bilirubin calcium, while catarrh of the gallbladder leads by a perverted metabolism of the mucous membrane to a pathological formation of cholesterol analogous to that seen in certain cysts, such as hydroceles or ovarian cysts. The catarrh of the ducts and gallbladder may be spoken of as lithogenic. If the catarrh starts in the ducts, the small calculi of bilirubinate of calcium may possibly find their way into the gallbladder and there form the nucleus of cholesterol calculi formed as the result of an extension of the inflammation to the gallbladder. Acute suppurative inflammation of the

ducts and gallbladder does not lead to the formation of calculi. This would appear to depend on the fact that destruction of the mucous cells necessarily prevents the formation of cholesterol. As catarrhal inflammation is the essential antecedent of cholelithiasis, it will be necessary to consider what are the exciting and disposing causes of catarrhal cholecystitis and cholangitis.

The exciting causes are infection with microorganisms and possibly the action of poison excreted into the ducts. The microbic origin of gallstones has attracted very considerable attention since it was first suggested by Galippe in 1886. Experimentally it has been shown that the production of cholecystitis by the bacillus of typhoid fever and the colon bacillus is followed by cholelithiasis. Non-virulent cultures of streptococci and staphylococci may also give rise to calculus formation; virulent cultures, however, set up intense cholecystitis without any production of calculi. From Italia's researches, it appears that pure cultures of streptococci or staphylococci may lead to the formation of calculi which are composed only of lime salts: cholesterol may be found when there is an admixture of cultures of the *Bacillus coli*. Thus experimental work, like clinical observation, shows that cholelithiasis is due to comparatively mild forms of cholecystitis, or expressed in other words, is produced by an attenuated infection; this depends on preservation of the cholesterol producing epithelium in the slighter forms of cholecystitis and its destruction in more acute inflammations of the gallbladder.

The important microorganisms in the production of cholelithiasis are the colon bacillus and the typhoid bacillus. The most important part in the microbic origin of biliary calculi is usually ascribed to bacilli belonging to the colon group. The colon bacillus has often been demonstrated inside biliary calculi; recent calculi especially show the presence of bacilli, while old calculi usually do not, or at best, show only the faintly staining shadows of microorganisms. It is generally believed that the colon bacillus reaches the gallbladder by an ascending infection of the common bile duct from the duodenum. It appears from bacteriological examination of the duodenum in health that during fasting the mucous membrane may be sterile and that when microorganisms are found, they are, so to speak, accidental and derived from the ingesta. A factor of importance in the production of an ascending infection is more or less stagnation of the bile; otherwise, the microorganisms would be washed out of the ducts by the bile. On the other hand, it is highly probable that the colon bacillus reaches the liver by the portal vein and is excreted into the ducts.

The causal relationship between typhoid fever and gallstones was suggested in 1886 by Herrmann of Nancy, on clinical grounds, *viz.*, the occurrence of biliary colic in patients with typhoid fever who had not previously had any signs of gallstones. Calculi have often been found in the gallbladder shortly after typhoid fever in patients who had not previously exhibited any signs of cholelithiasis. In typhoid fever, the *Bacillus typhosus* is almost con-

stantly found in the gallbladder after death as a rule without any calculus formation. It is, therefore, probable that the production of calculi depends on the cholecystitis and not on the presence of microorganisms alone.

The theoretical production of cholecystitis by toxins without any microbic intervention is logically possible; it has not been shown to occur in man.

Disposing causes.—Many factors favor the production of catarrh of the gallbladder and bile ducts and hence dispose to gallstones. Stagnation of bile in the gallbladder does not in itself lead to the formation of calculi, but it renders infection more easy, since microorganisms which get into the bile are not removed, but are allowed to multiply there and may subsequently set up cholecystitis. Sedentary habits, want of exercise, obesity, and diseases which necessitate a quiet and restful life dispose to cholelithiasis. Tight lacing frequently leads to dilatation of the gallbladder and downward displacement of the right lobe of the liver makes the fundus of the gallbladder more dependent than in health. A wandering liver has much the same effect. Nephroptosis, or a floating kidney on the right side, may by traction obstruct the outflow of bile from the gallbladder. Among the factors that interfere with diaphragmatic respiration and, therefore, with the emptying of the gallbladder are tight lacing, abdominal distention from pregnancy, ascites, abdominal tumors, etc., cardiac and pulmonary disease. Foreign bodies are, of course, only exceptionally found in the gallbladder. Foreign bodies tend to produce stagnation and so favor the production of catarrh if microbes are present.

Catarrhal inflammation of the duodenum and intestinal tract is of great importance in providing microorganisms to induce similar changes in the gallbladder. Excessive eating or drinking, especially alcoholism, tends to induce gastrointestinal catarrh and hence cholecystitis and gallstones are likely to occur in gross feeders, especially when of sedentary habits. Chronic venous engorgement of the portal system whether from the backward pressure of heart disease, scirrhus of the liver, or other causes, disposes to catarrh of the gastrointestinal tract and so to cholelithiasis. Appendicitis has been thought to give rise to cholecystitis with calculus formation by acting as a primary focus from which virulent colon bacilli may travel to the gallbladder. A vegetable diet, by leading to fermentation, is more likely than a mixed or protein regimen to be followed by gallstones. Diet probably disposes to cholelithiasis by setting up dyspepsia and gastrointestinal catarrh. A saccharine or fatty diet has long been thought to be favorable to the production of gallstones. Restriction in the amount of liquid taken by the mouth would tend to diminish the amount of bile and so to impair the freedom with which the ducts are flushed. Long intervals between meals lead to stagnation of bile in the gallbladder and so favor infection. Anxiety and worry have been regarded as a cause of gallstones. Continued indigestion should be regarded as an important factor in their production, also constipation may increase intestinal catarrh and so dispose to infection of the gallbladder and the production of stones.

Gallstones often develop during or shortly after

pregnancy. Repeated pregnancies lead to a relaxed condition of the muscular abdominal walls and so to failure in the expulsion of the contents of the gallbladder. Glenard's disease or visceroptosis may dispose to gallstones in several ways. Kinking of or traction on the cystic duct may result and obstruct the exit of bile while nephroptosis on the right side and passive engorgement of the intestines may lead to the same change in the gallbladder. Cardiac disease disposes to cholelithiasis in the first place by rendering life more sedentary and thus leading to stagnation of bile in the gallbladder. Pulmonary disease, such as emphysema or chronic interstitial pneumonia may, by backward pressure through failure of the right side of the heart, dispose to gallstones. Diabetes does not seem to favor the production of cholelithiasis, but it may indirectly cause pancreatic diabetes. Myxedema is favorable to the formation of gallstones. Malignant disease does not seem to favor the production of stones, but there can be no doubt that carcinoma of the gallbladder is subsequent to and disposed to by the presence of calculi. Uterine fibromyomata are not uncommonly associated with gallstones. Hereditary influences may dispose to the formation of calculi. Some statistics show that gallstones are hereditary in a large proportion of cases; this was so in sixty-two per cent. of Kraus's Carlsbad patients. As already pointed out, sedentary occupations dispose to cholecystitis and gallstones; it, therefore, occurs more frequently among the rich, clerks, shoemakers, etc., who lead sedentary lives.

INCIDENCE.

In routine post mortem work, gallstones are found in different countries in between six and ten per cent. of persons. Gallstones are rare in warm and tropical countries and are common in cold and damp cities. Cholelithiasis is common in Germany, Austria, Sweden, Hungary, Russia, and is said to be infrequent in Holland, Finland, Denmark, and Italy. England and America come about midway between these two groups. Age has a tendency to increase the incidence of gallstones. Calculi are rare under twenty years of age. Sex may have something to do with the formation of stones. Women are more frequent sufferers and the causes are: lax condition of the abdominal walls which favors visceroptosis; abdominal tumors, such as uterine myomata, ovarian cysts, and the pregnant uterus; tight lacing which may cause kinking of the common or cystic duct; the more sedentary life led mostly by women; constipation, which is common in women and is favorable to infection of the bile ducts and gallbladder; pregnancy; inflammatory pelvic conditions which are fairly frequent in them.

(To be continued.)

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Medicine and Surgery in the Army and Navy

TREATMENT OF GUNSHOT INJURIES OF THE SPINAL CORD AT CASUALTY CLEARING STATIONS.

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No excuse is presented for not altering, except in a few minor details, the paper written over a year ago as the pamphlet on wound treatment circulated in the service. One meets in several quarters great reluctance to tackle such injuries by operation. One knows that operations in this class of cases are productive of striking results in a proportion less than in any other type, but the results of the injury in an unoperated case are no better. Only a few of the injuries directly due to a bullet or shell fragment can be compared with those met in civil practice. The outlook seems to be that operation in all but hopeless cases will, although attended by many failures, give quicker improvement and more complete recovery, when that is possible, than a less active line of treatment, in which the abnormalities surrounding or actually in the spinal cord are not removed. Recovery of function is obtained in such a small proportion, however, that only the most hopeful cases should be tackled when great pressure of work exists.

To judge from the greater vulnerability of the spinal cord, its lesser capacity for recovery, and the anatomical arrangement of the spinal canal, it might have been thought that the general desire to interfere in spinal injuries and to prevent secondary complications would have been as great as that shown with regard to cranial injuries, but this has not been the case. The technical difficulties of the classical operation of laminectomy, the loss of blood entailed by it occasionally under general anesthesia, and the doubtful results of deferred operations, seem to be the chief factors in preventing patients, suitable for early operations, being treated on principles similar to those which govern our treatment of wounds in other parts of the body.

In late cases the patients are usually in poor condition, suffering from pulmonary or urinary complications, and the parts are obscured by masses of fibrous tissue. In early cases the presence of fractured laminae usually makes the operation a comparatively simple one; it is easy to perform under local anesthesia, and the use of good adrenalin makes it practically bloodless. Pulmonary complications are not predisposed to, or influenced by, the anesthetic. Operation in the early stages can, in fact, be done with extraordinarily little upset to the patient. Out of a large number, I have never seen a death which could be said to have been hastened by it.

The fact that so many cases improve without operation, in spite of the abnormal conditions by which the cord is surrounded, would lead one to hope that they would improve more rapidly as well as to a greater extent, and that some cases other-

wise permanently paraplegic might experience relief if they were submitted to early operation. The cord, to a greater extent than most parts of the brain, is deleteriously affected and retarded in recovery by pressure of fragments of bone, foreign bodies, and other debris. There seems reason to believe that it responds well to prompt removal of these unnatural conditions. In a casualty clearing station, however, during a "push," a hurried selection of cases for evacuation must be made. Under present conditions, only those which are most favorable must be retained. In all cases which are sent off by ambulance train, the urine should first be drawn off, if retention be present.

Some general considerations in making the decision are here mentioned. There are three types which arrive at a casualty clearing station showing paraplegia: one, in which the symptoms are due to local concussion, another in which the cord is organically severed, and a third in which paraplegia has developed since the injury. The paralyzing effects of local concussion are often very marked. This may be caused even by the flight of a missile close to but outside the spinal canal; for example, temporary paraplegia may follow the passage of a rifle bullet from side to side between the spinous processes. In such cases the paralysis usually begins to clear up within a few days. If no sign of return of function occurs within nine or ten days, the question of operation for removal of the blood clot or possible depressed bone occurs, but must be decided at the base. If, on the other hand, a rifle bullet, causing a through and through wound of the trunk, traverses the spinal canal, the cord is usually hopelessly pulped. An estimate should, therefore, be made of the probable track of the bullet, bearing in mind that the position of the patient during examination may not correspond to that in which he was hit.

It is obvious that men with complete, sudden paraplegia should not be kept in the casualty clearing station, if they are otherwise fit to travel. If, however, the paralysis has developed since the man was wounded, it is probably due to pressure from blood clot, when it is not likely to be absolute, or to displacement of fragments of bone during movement. In both these cases early operation may be indicated, but in the latter only if x rays show a minor degree of displacement. If displacement is great, the cord is probably pulped. If conduction, either motor or sensory, is present in the affected part of the cord when the patient is admitted to the casualty clearing station, it is usually found that fragments of bone are pressing on the cord, or that the missile causing the injury is in close relationship to it, and will probably have carried in sepsis. There may or may not be partial division of the cord. A missile with momentum sufficient to carry it far past the cord usually produces complete early paraplegia, even although it may not cause complete section. If then x rays reveal fracture, or the presence of a foreign body partly or wholly in the spinal canal, operation

should be done at once, with the triple purpose of relieving pressure, cleansing the wound, restoring normal circulation as soon as possible, and thus of combating sepsis.

In some cases pain is so excessive and uncontrollable by other means, that, whatever the amount of paralysis, operation is imperative, in order to relieve the pain. In a considerable number of cases, spinal injury is so extensive in itself, or is associated with other injuries of such a nature, that when the collective results are computed, it is extremely doubtful whether it is justifiable to take up the time of the surgeons to the exclusion of more hopeful cases. Sometimes, however, when time permits, it is desirable, from a humanitarian or family point of view, to clean up the wound, so that the patient may have a chance of reaching home alive.

Selection of cases for operation.—Roughly speaking, it may be said that operation is indicated or advisable at a casualty clearing station: (1) In the presence of incomplete paralysis of motion or sensation below the lesion, especially; if x rays show displaced fragments of bone or the presence of a piece of metal in or near the cord; when the symptoms of paralysis have developed after the infliction of the injury, unless due to inflammation in cases which have been lying out, when operation is practically hopeless; when pain, due to pressure on nerve roots, is excessive and uncontrollable; in very exceptional cases, when the character of the wound is such that sepsis, although not already evident, is likely to develop and cause rapid death, and it is important to keep the patient alive as long as possible.

In all other cases it is better, when feasible, that the patient should be evacuated without delay. In cases which are retained for more than a few hours in a casualty clearing station, urotropine should be given as a routine in an attempt to prevent cystitis. Too great care cannot be exercised in performing catheterization.

Certain operative details.—1. Local anesthesia, by infiltration down to and including the periosteum of the laminae and articular processes, is as effective as in a trephining operation and even more easily carried out. The patient should receive such a preparatory dose of morphine or pantopon scopolamine that he becomes drowsy. It is rarely necessary to use a general anesthetic at any stage of the operation, unless the track of the missile is followed into nonanesthetized tissues. A few whiffs may be given if the patient complains much of the pain of the injection, but the latter should be gone on with during the administration. Adrenalin renders the field practically bloodless.

2. If the wound is in or near the midline, it should be carefully excised down to the bone, as in a trephining operation. If the wound is well to one side, a fresh, free incision should be made in the midline. This is sutured at the end of the operation, while the track of the missile is cleaned, antiseptized, and used for drainage purposes.

3. Set operations should be avoided. A typical laminectomy is rarely indicated. The laminae can usually be nibbled away, as is done in most cases

of trephining for depressed gunshot fracture, until healthy dura is exposed all round the injured area. All obstruction to the easy removal of fragments should be removed before any attempt is made to lift them out. The greatest delicacy should be exercised, especially if movement of these fragments causes pain or twitching. One of the great advantages of local anesthesia is that the patient is capable of feeling such pain. This fact may prevent further gross injury to the cord.

4. If the wound is not sutured, if the dura has been opened, Carrel's method of aftertreatment, with the patient lying on one or the other side, should be carried out. If the dura is unopened a gauze pack may be used. It will be seen that the operation, in cases suitable for it, is on all fours with trephining the skull in gunshot injuries, both as regards technic and indications for dealing with dura, etc.

5. In cases which are retained in the casualty clearing station, the question presents itself as to whether suprapubic drainage of the bladder should be done. If operation on the spine shows that early improvement may be expected, it may be advisable to postpone drainage of the bladder. In any case, if cystitis threatens, drainage is indicated.

EPIDEMIC OF SORE THROAT AT FORT ETHAN ALLEN, VT.

By MAJOR ISAAC W. BREWER, M. O. R. C., U. S. A.

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On July 12, 1917, owing to the large number of admissions from Troop A, Second Cavalry, of men having sore throats, an investigation was made as to conditions. The organization was paraded and the throats of all men examined, resulting in a number of them being sent to the hospital. In all there were forty-four cases distributed as follows:

Unknown date of attack.....	2
July 10th	3
July 11th	8
July 12th	23
July 13th	7
July 14th	1

One man, Private H. McLaughlin, was taken with a sore throat, about one and one half months ago, but an examination of his throat showed streptococci and diplococci, he was also apparently suffering from secondary syphilis and his throat condition might be due to that. The horseshoer in the troop, Hall by name, was suffering from sore throat and had had tonsillitis quite frequently, and in March he was in the hospital at Fort Oglethorpe, Georgia, with sore throat. An inspection of his throat showed many large follicles and a scraping from the bottom of one of these follicles showed fuciform bacilli and spirilla similar to Vincent's organism. This man slept in the stable, and, although he had his meals in the dining room, he did not have very close contact with any of the men who were taken sick. Of the three men who were taken sick on July 10th, there is some question as to whether the date is not July 11th. Among the early cases taken on July 11th was cook H. Lease. An examination of his throat showed the spirilla above mentioned. Owing to

the fact that several cases appeared among the prisoners who ate in Troop A, it is believed that the kitchen was the source from which the disease was spread. This troop only used canned milk, and an examination of the menus for the first twelve days of the month of July did not show anything liable to be a medium for the spread of sore throat. The man, H. Lease, arrived at Fort Ethan Allen on May 8, 1917, and for a time was a member of the First Recruit Troop. He was transferred to Troop A of the 2nd Cavalry about June 18th and was at once assigned to the kitchen. About ten days before going into the kitchen he had a cold, but was not very sick. He gives a negative history during the past six months, and as far as investigation shows, was not closely associated with any one who had a sore throat.

None of these cases were seriously sick, but all those admitted to the hospital were cultured by the Laboratory of the Vermont State Board of Health. The findings in the laboratory and some smears made in the Post Laboratory showed a long streptococcus in quite a number of cases and in other spirilla and fuciform bacilli.

An examination of the throats of the men showed, in most instances, ulcerations of the soft palate or the tonsils, which were covered with a dirty grayish white membrane. Some of them had the appearance of diphtheria. Some of the early cases were given antitoxin before the first cultures were returned. It is not believed that the antitoxin had any effect upon the course of the disease. They all cleared up very readily and within two or three days were returned to duty.

Of the cases treated in the hospital, 4.8 per cent. had temperatures below ninety-nine; 38.1 per cent. between ninety-nine and 100; 33 per cent. from 100.1 to 101; nineteen per cent. between 100.1 and 102, and 4.8 per cent. above 102. The average number of days lost by the men was 2.4. Three men lost only one day. Nine men lost nine days; six men three days and three men four days. The remainder of the cases were not admitted to the hospital.

Horseshoe Hall's tonsils were removed by the surgeon, but through an error they were thrown away and no examination could be made.

Although there have been a few cases of Vincent's angina admitted to the hospital since that time, there has been no further spread of the disease in Troop A up to the time of writing (November 11, 1917), and it is believed that horseshoe Hall was the carrier of the infection, whatever its nature was, and in some way he infected the cook, and through that source the rest of the men.

I wish to thank Colonel George H. R. Gosman, Medical Corps, for permission to publish this.

Forced Diuresis in Experimental Poisoning with Diphtheria Toxin.—W. D. Sansum (*Journal A. M. A.*, March 30, 1918) was unable to protect dogs against the lethal effects of minimal doses of diphtheria toxin by means of colossal diuresis produced by the intravenous injection of alkaline hypertonic saline, eighteen per cent. glucose, or glucose in Ringer's solution.

MEDICAL NOTES FROM THE FRONT.

Aseptic Treatment of Wounds.

GENEVA, February 4, 1918.

The partisans of the aseptic treatment of wounds of warfare have in mind above all their cytophylactic action on the phagocytes and, therefore, they usually employ solutions having a molecular concentration about equal to that of blood serum.

The aseptic treatment is of two kinds: with *animal sera* or *saline solutions*.

In 1904, R. Petit advised treating infected wounds with dressings soaked in fresh normal horse serum, but I am led to assume that this method has not been greatly employed. In March, 1912, Leclainche and Vallée published a paper on a serum containing antibodies corresponding to the various agents of inflammation and suppuration. It contains the requisite factors obtained from multiple varieties of staphylococci, streptococci, colon, pyocyanic, proteus, vibrio, and perfringens. It is furnished by horses which have been immunized against these bacteria and is intended to produce digestion of these microbic agents in wounds by bringing to the organic cells, in the form of a specific serum, the corresponding sensibilizing agents which maintain the cells in their entire vitality, as well as their aptitude for manufacturing repair tissues. Some excellent results have been obtained when employed locally on dressings or in hypodermic or intravenous injections at the dose of ten to twenty c. c. It may produce anaphylactic accidents like any other serum, but these can be avoided by Besredka's method. As an example, I would say that Bassuet has treated 424 cases of long standing fistulae and 377 cases of foreign bodies by this serum. The fistulae were favorably influenced and the foreign bodies were eliminated without surgical interference.

As to saline solutions, salt solution at eight per 1,000 is very generally used, likewise sea salt. It is possible that the sodium chloride acts not merely as a cytophylactic, but also by the chlorine it contains. Abadie has even advised the use of a 140:1,000 solution which is very hypertonic, not to say fearfully painful.

Wright, who has little, if any, faith in antiseptics, proposes to reinforce the organic defence by hypertonic solutions at twenty per 1,000 which inhibit bacterial growth and solutions at fifty to 1,000 which completely overcome it. Briefly, Wright advises treating wounds at the dressing station by hemostasis, cleansing, the application of dressings, immobilization, and injection of vaccines; at the ambulance by removal of foreign bodies, free incision and irrigation with a 50:1,000 salt solution, and packing the wound with salt tablets. From all I can learn, the English surgeons are not overjoyed with results obtained and a reaction has taken place unfavorable to the salt treatment. It has never had much of any vogue among our French confrères. Pure sea water has been proposed by some in France but has not, I believe, been favorably met with.

On the other hand various physiological compound sera have been essayed and I give several formulae. The composition of the Hedon-Fleig is as follows:

Sodium chloride,	6 grams;
Potassium chloride,	30 centigrams;
Calcium chloride,	10 centigrams;
Magnesium chloride,	30 centigrams;
Sodium phosphate,	50 centigrams;
Sodium bicarb.,	1.50 gram;
Glucose,	1 gram;
Water,	1,000 grams.

Sonbeyran advises Schiassi's fluid:

Sodium chloride,	6.50 grams;
Potassium chloride,	30 centigrams;
Melted calcium chloride,	1 gram;
Sodium bicarbonate,	50 centigrams;
Glucose,	1.50 gram;
Water,	1,000 grams.

The solution is sterilized without the calcium chloride, which, when hot, gives calcium carbonate; the stock solution of calcium chloride at ten per cent. is sterilized by itself and a sufficient quantity is added to the solution.

Grautret and others are warm in their praises of the Ringer-Locke solution, but, as this must now be known to all, I omit it.

The above solutions are isotonic and do not interfere with osmosis or hemolysis.

Now, Delbet has carried out researches—I do not say that they are convincing—on the action of these and other solutions on phagocytosis. He has found, on an average, that leucocytes immersed in Leclainche's serum phagocyte showed 109 bacteria.

For some month past there has certainly been much adverse comment made as to the real value of antiseptics in war surgery. It is upheld by some that antiseptics should possess a germicidal action such that, even when their activity is reduced in contact with the serum and other protein bodies, they should still retain a powerful antiseptic action. Soluble salts which are not precipitated by protein bodies penetrate the tissues and are absorbed by them are unquestionably more potent than those whose penetrating power is less. An ideal antiseptic is that possessing a low toxicity and a mild local irritating action with a high bactericidal action, so that large quantities of the substance can be employed. An antiseptic must not inhibit phagocytosis, should kill bacteria but not the living cell. Briefly, it should be cytophylactic. And lastly, an antiseptic must not be hypotonic to the medium in which the cells live; therefore, it must not interfere with osmosis.

The opponents of antiseptic treatment maintain that there is no antiseptic fulfilling these conditions. Disturbances which they occasionally produce have been laid at their door, such as gangrene (carbolic acid), simple or febrile erythemata, acute or chronic poisoning, dermatitides, and divers toxic phenomena (sublimite), eczema (iodoform), headache and other symptoms (iodine), and a host of others too long to enumerate. These are facts known for years and do not deserve mention. But, unfortunate results arising from the indiscriminate use of active substances or from individual idiosyncrasy, are not sufficient reasons for giving up valuable and well tried measures for controlling septic processes. Antiseptics have been accused of causing tissue changes when they impregnate them. Tincture of iodine (ten per cent.) or powdered calcium hypochlorite are said to produce secondary hemorrhage by ulceration of the bloodvessels, as if infection was not in itself quite enough to give rise to pathologic

changes in the vessel walls! The opponents of antiseptics seem to lose sight of the fact that by destroying the tissues in an infected area, as is done, for example, in gas gangrene with the thermocautery, a barrier to the infection is set up and certainly one of our most effective means of sterilizing serious foci of infection is by carbonization with heated air.

Antiseptics not infrequently owe their curative effects to their irritating action on the tissues and certain surgeons thus explain the results obtained with solutions of the hypochlorites and then seize upon the opportunity to decry Dakin's solution because it is not so irritating as liq. Labarraque, which many advocate. Such a line of argument is most unreasonable, to say the least.

Another reproach made to antiseptics is their mild action, even *in vitro*, this being still more marked when in presence of protein bodies or serum, as occurs in wounds. The antiseptic, in the first place, becomes combined with the protein matter of the medium before it attacks the protein matter of the bacteria.

Unquestionably, the antiseptic action varies greatly according to the individual differences of resistance of the bacteria present, the medium in which they are living and their numbers, so that should they be destroyed after prolonged action, yet their spores are hardly ever killed. Sublimate, 1:1000, carbolic acid, 5:100 and iodine vapor have no action on the septic vibrio after a contact of forty-eight hours *in vitro*. Six hours, at 36° C., are required for a 2.50 per cent. solution of carbolic acid to kill the subtilis, bacteria grow in iodoform, and the streptococcus thrives in oxygen water.

Antiseptics do not sterilize pus, says Delbet, but for him carbolic acid is the most potent, calcium hypochlorite the least potent of antiseptics and he even goes so far as to say that Dakin's solution favors microbial growth in pus. He maintains that calcium hypochlorite first acts on the proteins, the lecithins of pus, hence they transform a wound into a more favorable medium for bacterial growth, while at the same time the solution kills the cell elements. He also maintains that clinical researches are insufficient for the study of antiseptics, while Carrel, Pozzi and a host of others who defend antiseptic methods uphold that clinical experimentation is the crucial test in surgery.

Now, we know that Delbet affirms that pus *per se* is bactericidal. Pyoculture, in his opinion, is quite enough to prove the uselessness of antiseptics in wound treatment and he offers the following conclusions: iodine has no action on bacterial flora and is useless; either in irrigation or on dressings it does not change the nature of the bacteria; Hg. bichloride solution 1:1000 increases the number and vitality of the bacteria; powdered lactose is simply a deodorizer, this property being due to a change occurring in the odoriferous substances and not in the bacteria themselves; oxygen water irrigation does not even prevent the development of anaerobic organisms; all antiseptics kill the cells without killing the bacteria. Air and light are the most powerful means at our disposal for destroying bacteria, and when employed, a positive pyoculture will become negative or *nil* at the end of twenty-four hours.

Here a word of explanation becomes necessary. A pyoculture is positive when the culture is more abundant in the pus taken from a wound than in a broth culture, a fact which makes the prognosis serious and indicates surgical interference. Pyoculture is *nil* when the bacteria do not develop in the pus; it is negative when no bacteriolysis occurs in the pus. In the second case the surgeon should assist the organism in its efforts to fight the infection, in the latter he should abstain from any treatment as the patient himself can effectively deal with the process. Pyocultures may be elective for a given germ. Thus it may be negative for the staphylococcus and positive for an anaerobic organism. In these circumstances it is the latter indication which calls for surgical interference.

Now, I greatly question if pyoculture is rigorously exact scientifically and this view is held by Carrel, Wright, Policard and others. Unquestionably, the procedure is seducing in theory and its principle is founded on the exact principle of progressive immunization of the organism, resulting from an increase in the bactericidal properties of both cells and plasma. All this doubt raised by Delbet is undoubtedly very pretty, and I regret that space forbids a detailed examination of his interesting experimental work, but in order to judge correctly the value of methods one must recall that the conditions of disinfection of a wound vary with the microbic flora present as well as the general health and resistance of the subject. Therefore, one must always accept with due caution what takes place *in vitro* as compared to phenomena occurring in living tissues.

To conclude; I refer to an antiseptic and cytophylactic method devised by Cruet and Rousseau which gives promise of good results. They tried to obtain a stable nonirritating, germicidal, and cytophylactic fluid which could be used warm. This they found in a solution of sodium or magnesium chloride in which chlorine was made to intervene secondarily.

To prepare it, they began with a solution of calcium hypochlorite which always contains free alkali $\text{Ca}(\text{OH})^2$. The calcium, formed by electrolytic decomposition of the hypochlorite, is irritating to the tissues.

Two hundred and fifty grams of calcium chloride are diluted in water and then eighty grams NaCl , or 120 grams magnesium chloride in 500 c. c. water at $+50^\circ \text{C}$. are added. The homogenous, milky fluid thus obtained is poured into a ten liter container which is then filled with water at $+50^\circ \text{C}$. The liquor is siphoned off and filtered on asbestos. To the heated liquid thirty to forty grammes of lactic or phosphoric acid are added until a neutral or very slightly acid reaction is obtained. The container is then closed in order to prevent the freeing of hypochlorous acid and on cooling lactate or phosphate of lime, as the case may be, becomes deposited. The liquid is then filtered.

The lactic acid frees the hypochlorous acid which being unstable, gives rise to chlorine, water and oxygen. Slowly, and in a few days, the free chlorine dissolved disappears and the reaction remains neutral. A stable chlorinated salt is formed, probably a perchlorate. This salt can be cytophylactic, or when in presence of the fluids of the organism gives rise to sodium or magnesium chloride. If any free

chlorine remains it gives chloramines with the proteins of the tissues. The liquid can be heated for use.

The solution has given excellent results in the treatment of infected wounds and I have referred to it in detail because I feel that its use will extend.

CHARLES C. COLEMAN.

MEDICAL NEWS FROM WASHINGTON.

Continuing as before—The Army Surgeon General—Shall continue to head the Army Medical Department—General Gorgas—Chairman of the Board of National Defense—Medical Reserve.

WASHINGTON, MAY 17, 1918.

An important conference is soon to be held at Washington between representatives of the Medical Department of the Army and of medical colleges, in order to come to some understanding in regard to the acceptance for military service of professors and instructors at those institutions. There has been a disinclination to bring into the service members of the medical profession employed in the education and training of medical students, on the theory that such educators are fully meeting the demands upon them to a greater advantage to the country than if they, individually, were commissioned as medical reservists.

However, some of this class are desirous of separating themselves from the schools, if such a connection is to prove a handicap, while the college authorities apprehend that such a draft upon the personnel of the faculties would be detrimental to the system of training men for the profession, with a direct influence upon the list of those that ultimately would be available for the army as medical officers.

Some doubt is expressed as to the efficacy of any arrangement that may be made, since in the end everything depends upon the individual, and, regardless of any agreement, an instructor always will have the privilege of severing his relations with an institution, if necessary, in order to become eligible for appointment as a medical reservist.

Although some time must elapse before there is a vacancy in the office of the Surgeon General of the Army, speculation continues as to who will succeed Major General Gorgas when that officer reaches the retiring age in October. However, it is by no means certain that another officer will be selected for the place, and there are indications that, if General Gorgas desires to remain on active duty, he will be continued after the date of this transfer to the retired list as head of the Army Medical Department.

There is also talk of appointing some prominent member of the medical profession, who is not now a member of the Medical Corps of the Regular Army, to the place, in which event the new appointee would be assigned to duty as "Acting" Surgeon General. Among those mentioned for the place is Dr. Franklin H. Martin, secretary general of the American College of Surgeons, chairman of the general medical board of the Council of National Defense, and a major in the Medical Reserve Corps.

If a successor to General Gorgas is selected from among the members of the Regular Medical Corps,

the following probably will be considered: Brigadier General Charles Richard and Brigadier General William H. Arthur, National Army, who are colonels in the Regular Corps; Brigadier General M. W. Ireland, National Army, colonel in the Regular Corps, who has just been promoted to the higher grade and who has succeeded Brigadier General Alfred E. Bradley, National Army, as chief surgeon on the staff of General Pershing in France, the latter having been invalided home; Brigadier General Francis A. Winter, National Army, on duty in France, and Colonels Guy L. Edie, Jefferson R. Kean, and Robert E. Noble, of the Regular Corps.

* * * * *

In view of the memorandum recently submitted by the Surgeon General of the Army and the objections generally of the army medical authorities to the admission of osteopaths to the Medical Corps and Medical Reserve Corps, as recently noted in these columns, it appears likely that, pending legislation, regulations as to osteopaths will not be enacted into law.

If an osteopath has an M. D. degree and otherwise meets the professional requirements adopted as the standard of appointment, there will be no objection to his appointment, but the medical authorities do not propose, if they can avoid it, to extend or amend or modify the conditions of appointment in behalf of any of the numerous "schools" of treatment, members of which have appealed to the Secretary of War and the President in behalf of their associates to serve in some capacity in the army. The same stand has been taken in regard to the Christian Scientists, who have been making an effort to be recognized by membership in the Medical Department. If "healers" of that organization are appointed to the military service, it will be, as they are in the navy, as a part of the Chaplaincy Corps.

On this point the medical officials entertain a fixed conviction, refusing to be held responsible for the results of an epidemic, for example, which may occur at any time among large bodies of troops, should there be any radical departure from the approved method of treating the sick.

* * * * *

The War Department has adopted a policy of relieving retired officers from command of troops, departments, and posts, and a number of high ranking officers of the retired list are slated for relief from active duty. Among them is Colonel Henry P. Birmingham, formerly of the Medical Corps, who since his retirement several weeks ago has been in command of the medical officers' training camp at Fort Oglethorpe, Ga. He will be succeeded as commandant of the camp by Colonel Henry Page, of the Medical Corps.

* * * * *

In view of the intimations recently made in certain quarters as to defects in administration of the army medical department in France, interest and importance attaches to a personal letter received from Major Hugh H. Young, of Johns Hopkins University, director of the division of urology, of the American expeditious force.

Major Young says that things are moving satisfactorily, but necessarily slowly. "We are gradually

getting a wonderful system of hospitals and the medical organization of the army is proceeding apace. So far, there is not much surgery, and every one has been most concerned with infectious diseases, of which there has been plenty, as in the United States. The respiratory infections have been particularly fatal, and there has been a great deal of diphtheria, measles, mumps, etc., and spinal meningitis. The venereal situation is really remarkably good. The rate has remained between three and four per thousand for several months, and some organizations have been almost entirely free from infections. The Forty-second division, for instance, only had one new case reported during the month of December, and only four in February, with 26,000 men. At least six of the base hospital contingents, each containing about 200 men, have not had a single case of venereal disease in the contingent since leaving the States from six to ten months ago. The prophylactic and educational methods which have been adopted and carried out in great force have been very effective and putting the houses of prostitution out of bounds has also had great results."

* * * * *

The Senate has confirmed the nominations of Assistant Surgeons Charles V. Aikin, Frank M. Faget, John H. Linson, Knox E. Miller, Alvin R. Sweeney, Clifford E. Waller, Newton E. Wayson, and Joseph G. Wilson to be passed assistant surgeons in the Public Health Service.

* * * * *

Warning that the country should be prepared for death casualties in probably increasing numbers as a result of gas attacks in France is being given by the army medical authorities. Despite improvement in gas masks and anti-gas warfare, casualties are the result mostly of surprise attacks, which have been launched on such great scale that mortars and similar gas shell implements have been fired in such perfect unison that fifteen tons of gas have been in the air at one time over a few hundred yards of front. When this falls into the trenches, there is necessarily excitement among the men, many of whom do not get their masks in position in time, although it is a part of the training that they must have the masks in place within six seconds.

It is interesting to know that the Germans figure that in a gas attack of considerable dimensions there should be at least ten per cent. of casualties. The British have nothing like that number, being better protected than the Germans. In the meantime, at home, work is progressing satisfactorily on the manufacture of gas masks, although some difficulty has been experienced in obtaining certain chemicals, for one of which it may be necessary to go to Trinidad or the Philippines.

* * * * *

A research division has been established in the Naval Bureau of Medicine and Surgery to investigate the chemical and physiological phases of modern warfare, dealing especially with gas warfare, submarine service, and deep sea diving. While these subjects might seem at first widely separated, they have many features in common. In modern warfare, attention has been directed to the necessity of providing the personnel not only with good food, clothing, and housing, but above all with good air.

Editorial Notes and Comments

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RECONSTRUCTION OF THE DISABLED SOLDIER.

Perhaps there is nothing new under the sun. Perhaps some prehistoric Agamemnon or Cyrus devoted time, thought, and labor to the rehabilitation of the victims of his warlike ardor, but history tells us of no such movement for the reconstruction of maimed and wounded soldiers in the past as that taking place now all over the civilized world. Yes, and even in Germany. The custom heretofore has been to thrust out of an army its maimed and crippled members no longer capable of military duty, to cast them off with no provision for their future, beyond perhaps a wee pension, too small to procure even the bare necessities of life. Many of us can still remember the fate of sundry boys in blue or gray, victims of the Civil War. Welcomed home with emotional enthusiasm as heroes for whom too much could not be done, dined, winced, and made to feel happily confident of at least a modest competence. Then a search for employment, hopefully at first, to find nearly every employer "passing the buck." Discouragement deeper and deeper, until

he was considered fortunate who secured a job as watchman, gatetender, or something else at the bottom of the labor scale, with no outlook for improvement. A bare subsistence in intense poverty, nothing else to hope for, nothing else to live for, an object of pity, soon, in his rags, of aversion. God help him. Man's help passed him by with the dying away of the emotional excitement.

"Robbed of my strong young manhood,

Nursing a shattered limb,

Crippled, forlorn and useless,

The glories of life grow dim.

Before me, lone, heartbroken,

The crowds pass gaily by.

O comrades, such living is harder—

We know it is easy to die."

But the future of our wounded boys is not to be trusted again to an emotional enthusiasm that quickly evaporates. Like the rest of the world we are about to make an intelligent effort to rehabilitate those who have given for us more than their lives. We can claim no priority to the idea. On the contrary we are rather late in adopting it, but we are creating plans in cold blood, utilizing the experiences of other countries, and making preparations on a gigantic scale to carry those plans to fruition. We propose to keep our crippled boys in the army, where they will be furnished food, shelter, and clothing, with a little money, until they are equipped to overcome the handicaps imposed by the mutilations they have suffered.

This idea was not born full fledged. It was conceived years ago, has grown and developed slowly. We see its influence in the efforts of various societies to rehabilitate the injured workman in civil life. After the South African War, a Soldiers' and Sailors' Help Society was organized in England to maintain workshops for disabled veterans, the activity of which was greatly extended after the present war began. The machinery to care for cripples was ready in Germany and was set in motion within a week of the opening of hostilities. France followed quickly, and in our issue of May 4th we gave our readers an excellent account of what she has done. Italy and Russia followed suit, and, on this side of the water, Canada set the example of providing convalescent homes and training classes.

The old proverb is wrong: This is something new under the sun, this magnificent development of the idea of the rehabilitation of crippled men, crippled for us, to fit them for daily life in competition with ourselves when our sense of gratitude for their sacrifices has become inert.

VOLUNTEER NURSES' AIDS

At the annual meeting of the General Medical Board held at Washington on May 5th, a brief summary was presented of the situation regarding nurses by Lieutenant Colonel William H. Welch, of Johns Hopkins University. He stated that there were about 83,715 graduate nurses registered in the United States, 14,387 more would be graduated this spring, making a total of 98,162. About 9,000 had already entered the service, about 3,000 of these were either abroad or under orders to proceed abroad, and about 24,000 would be needed to supply the needs of the present army in action on the battle front. To keep up the supply about one thousand trained nurses a month would be required. But our schools only turn out about 11,000 graduates annually.

Moreover, we are now told that a million additional troops are to be put into the field as soon as they can be called and mobilized, making a total of approximately three million men under arms. This would require an additional hundred and fifty thousand hospital beds, making a total of four hundred and fifty thousand. To care for hospital organization on such a scale, fifty thousand trained nurses would be required.

All of these statistics prove that it is hopeless to expect to supply the number of trained nurses needed for the army through the channels now available. In the *NEW YORK MEDICAL JOURNAL* for April 27th, we proposed the utilization of that vast reserve of energy and intelligence which will be found among the better class of women who have not yet been called into war service in any capacity, by the organization of a volunteer nurses' aid corps. These volunteer aids would be drawn from the well to do who would cheerfully give their services free, but for whose services no provision is now made. In the British army the volunteer nurses have done remarkable work in aiding the trained ones. Our own American women are no less patriotic or competent. How can these volunteers be made best use of? We proposed that they should be taken into the military hospitals and trained. In January, the Surgeon General decided that it would be inexpedient for the army itself to undertake the training of professional nurses, but so far as we are aware, the question of whether the army can undertake the training of volunteer aids has not been determined.

Dr. S. S. Goldwater, chairman of the war service committee of the American Hospital Association, proposes that these volunteer aids shall be trained in the nurses' training schools already established throughout the country. There are 1,500 of these. In *The New York Times* for May 12th, Doctor Goldwater states that 300 of these will be capable of

training twelve nurses' aids each month, or one hundred and fifty a year, making a total of 25,000 who could be trained by the first of next year. This suggestion of Doctor Goldwater seems practicable and offers a solution of two grave problems. One, supply of an adequate number of nurses for military hospitals and the other how best to make use of patriotic women who have had no previous training, but wish to do their part toward helping win the war. Doctor Goldwater's plan should be put into operation at once.

VIS MEDICATRIX, VIS DIRECTRIX, VIS
SCULPTRIX NATURÆ.

There should be no room in modern medicine for misleading animistic personifications, yet these three handmaidens of Dame Naturæ mentioned above may be differently viewed to determine whether their names are merely the harpstrings of a fatuous metaphysics or whether they represent some actual scientific facts on which a real medical science depends.

J. S. Haldane [*The Relation of Physiology to Medicine, Edinburgh Medical Journal*, vol. XX, No. 4, April, 1918] makes bold to use these terms and to group them together as expressive of the only aspect in which medicine presents itself as a really practical science. He states through them the recognition of the functional fact which makes physiology or any other department of medicine related to any or all others. He strikes at the very foundation of the lack of interest engendered in any one department—physiology forming the particular subject of his discussion—as it is presented in the classroom, and the lack of vital application of this or any other subject to the health of the individual and the community as a whole.

In fact, in using these terms to press his point he is delivering anatomy, pathology, physiology, every branch of practice or study, from a deadening abstraction and classification, which sever, for the student's interest at least, the vital business of medicine from his classroom toil. Hard and fast conceptions of any branch of medical activity, which separate that out into a field of its own for study or application, fairly stifle the widely pulsing radiation of interest which ought to electrify any profession and send the student into an enthusiastic search for new opportunities and new constructive interpretations through the interrelations within his science. This is particularly deplorable in medicine, where the very sources of human life and health—physical, mental, moral—meet, and where they cannot be understood or adjusted unless these artificial boundaries are broken through, are completely dissolved by a more unified conception.

If pathological anatomy, as the writer says, is a

figure stalking just between the chaplain and the undertaker, if physiology states dogmatically that the effect of CO_2 on the lungs is exactly so and so and then finds that the organism is able under certain conditions to bring about some different effect, we have to discover some further scope for our knowledge and observation and see really what this organism as a whole, under naturally changeable conditions, is about. The body, he reminds us, is no machine whose parts can be discussed and attended to separately, each to be left then in perfect condition for its own special function while the attention is turned to another separate part.

Something makes this human organism work differently from a machine, makes the functioning of one part dependent upon that of another, makes this dependence vary from day to day. Something makes the repair of it, the healing of its disorders, a matter for thorough investigation and interinterpretation. Pathology and physiology and anatomical structure, and mental behavior too, belong together, and, unless they are taught together and one constantly called in to the aid of another, each will fall dead as to interest and none will have their place in the business of establishing and maintaining human health.

The *vis medicatrix* is then only a term to suggest this, that there is some union in the working of the human organisms, body, and mind, which is effective in no one sphere but through all of the organism to restore structure and function. It is everywhere the same movement of energy shifting itself throughout the body or even expressing itself in mental images, under the impulse of which the body works, and may thus be called a *vis directrix* regulating the activities of the healthy body. If these things be so, they suggest furthermore the sum and substance of this energy working through such channels in the ages of evolution preceding the present human form, and then further in and through the latter in the work of creation. To recall to our minds this never to be neglected process this might also for convenience be called the *vis sculptrix*. And so the author has only presented and enforced the concept of the entire human being as the object of medical study and practice, a being far more than a mere mechanical organism,

or a harborage of specialties for anatomical study or therapeutic endeavor. For the doctor and for the professor there is the broadly human side which makes of any one of these specialties only a part of a plastic, constantly shifting whole, for which there must be interrelation in study and adaptive treatment in therapy.

Haldane has approached this big question with a telling illustration from the physiological field, where he proves the futility of the narrow, limited method of teaching and of considering health and disease. He emphasizes the uselessness of elaborate systematic descriptions of any process or organic structure, or of precise disease reactions to harmful agents, without taking into account the regulative action which is also going on constantly. Only through this can there be an understanding of the

variability of results from environmental conditions or in disease processes, and only thus can these systems of instruction come out of their formal interest, destroying encasements and show themselves related to human material. The physiological realm is however only illustrative of the entire action of the human being, and mentally as well as physically he can be understood and treated only with an appreciation of this regulative energy movement, which the writer has been pleased to call by these "old-fashioned" names.

AN APPRECIATION FROM THE TREASURY DE- PARTMENT.

The splendid amount of publicity and advertising given the Liberty Loan by your Journal and your advertisers [in the Liberty Loan issue] was noted with a very great deal of pleasure and appreciation. It is evidence of a splendid and liberal spirit of patriotism on your part and their part, and I desire to thank you and them most heartily and sincerely.

F. R. WILSON,
Director of Publicity.

Washington, D. C., April 30, 1918.

A NEW "NEUROLOGICAL BULLETIN."

The Neurological Department of the University of Columbia must be remarkably free from nervousness themselves to venture on a new journal in days when so many papers are shrinking visibly. Perhaps it is because Psyche has thrown open her lands, her temples nowadays for common use, and is, to be found, herself, even in prisons, in asylums, in war hospitals, eager to diagnose and heal.

There is, perhaps, an objection rightly raised to the one-subject journal by those who are not specialists and who contribute articles to the medical press. It is, that an article printed in the "organ" of a society is practically lost to the men who might see it in one of the more generally read medical journals and thereby become interested. The specialists

answer that an organ supplies one need only, and that, if the doctor's need correspond, he has the concentrated wisdom of the month at his disposal without searching many volumes. Seeing that such an argument might be advanced to entice men to browse in this *Neurological Bulletin*, made up of "Clinical Studies of Nervous and Mental Diseases," a little suggestion might be made as to having an occasional paper, simply written as if for "the (medical) man in the street," and dealing with some of the mental conditions he meets every day. We have often seen a young doctor sitting dejectedly before a pile of journals, which, by title, bore on the subject he wanted, but were all too technical to help him much with the patient for whom, as an honest doctor, he was anxious to use the results of recent neurologic studies. Particularly have we seen this in remote mining and smelter districts where the insurance doctor was called on daily to diagnose for mine owners and insurance companies as to true conditions before and after traumatism. Even in little towns, where a few books only and no learned confrères are available, the worried doctor knows that the "earache," the "headache," the "nervousness" cannot honestly be treated today by pill, powder, and poultice, but may mean some obscure lesion for which he has no available help in tracking. How great to him the benefit of papers written in the lucid style of such men as Stern, Bramwell, or Débove. How gladly, having high desires but low funds, would he subscribe to any special journal giving such, seeing that the seven or eight dollar book is beyond his means and there is no library near.

But we would not overlook the fact that the editors of the new journal, with its good array of articles from Tilney, Hoyt, Wechsler, Goodhart, Osinato, *et al.*, intend having a systematic and uniform method of case presentation in which not only the positive findings shall have their place, but also observations of a negative character shall be included, and the cases will include the discussion of them by the clinical staff. The diagnosis will represent their consensus of opinion. The two first numbers give a very good impression and may tempt even the diffident doctor to venture under the covers.

THE THERAPEUTIC USE OF YEAST.

One of the most interesting features of scientific research is the results achieved in the correlating of apparently entirely diverse things. The studies in nutrition of Japanese seamen, which led to the practical banishment of beriberi from the Japanese navy, and the conferring of a barony on Surgeon General Takaki of that navy, was one of the first steps which led to the recognition of the value and

functions of vitamins. His studies were followed by the work of the American military surgeons, who demonstrated the fact that fowls fed on rice deprived of the cortical layer, developed polyneuritis, but could be cured by eating the substance which had been removed from the rice. Then came a general study of the constituents in these rice screenings, the absence of which produced polyneuritis, and the recognition of vitamins as the important element. Later vitamins were found in various substances, particularly, and in large quantities, in yeast. The value of the yeast vitamin fraction was the subject of an interesting study by Emmett and McKim, which was referred to in the *NEW YORK MEDICAL JOURNAL* for February 2, page 224.

Hawk and others have made a clinical study of the uses of yeast in diseases of the skin and of the gastrointestinal tract, which proves its therapeutic value in a wide variety of diseases, particularly in furunculosis, acne, gastrointestinal catarrh, and intestinal intoxication. While no attempt was made by the authors to isolate the active therapeutic agent, the studies which have been made of the action of vitamins naturally lead to the suggestion that it is the presence of these substances in the yeast to which its therapeutic value is probably due. This opens up an interesting field for study.

From a utilitarian point of view, however, there is no need to await the results of any analytical study of the particular elements to which the therapeutic value of yeast is to be traced. The essential point is that the cases reported by Hawk and his coworkers in *The Journal of the American Medical Association* for October 13, 1917, give conclusive evidence of the great therapeutic value of this easily accessible and inexpensive drug in a class of diseases which have been difficult to deal with. Furunculosis appears to be particularly amenable to treatment with ordinary compressed yeast.

RED CROSS WEEK.

This war is a war of millions. Men on the front are reckoned by millions, expenditures are made by millions and charity is dispensed by millions. The American Red Cross has raised a fund of more than \$106,000,000 and has appropriated nearly \$78,000,000 of this for war relief work. Another \$100,000,000 are needed, and the week beginning May 20 has been designated as Red Cross week, during which efforts will be made to obtain this sum by gifts from the people. The quota of New York City alone has been put at \$25,000,000. Those who have money should give and give freely, resting assured that the money entrusted to the American Red Cross will be expended wisely and economically, and that no sum which could be raised will be adequate to meet all the deserving calls which are made upon the Red Cross for help by sufferers whose need is urgent.

News Items.

New Traffic Rule for Physicians.—On Tuesday, May 14th, the Board of Aldermen of New York City adopted an ordinance authorizing the issuance of special cards to physicians which will permit their motor cars to stand in crowded streets when on urgent medical calls.

Army Medical Department Moves Into New Building.—The offices of the Surgeon General of the Army and the Medical Corps of the Army have been moved into one of the new buildings recently constructed at Sixth and B Streets, Washington, D. C. Other branches of the Medical Corps which were in other buildings in the neighborhood of the War Department have also been moved into the new building, thus centralizing all the offices of the corps.

Personal.—Dr. S. Dana Hubbard has been appointed to take charge temporarily of the Bureau of Public Health Education of the Department of Health of the City of New York. Dr. Charles F. Bolduan, director of the bureau for many years, has been granted an extended leave of absence, and his resignation will take effect on November 1st. Doctor Hubbard was recently appointed head of the Department of Epidemiology, and will carry on the work of both departments until Doctor Bolduan's successor has been appointed.

Hospital Facilities in the United States.—A central bureau of information concerning the hospital facilities of the United States in war time has been established by the Medical Section of the Council of National Defense, Washington, D. C. Information regarding over 1,000 active hospitals has been collated and indexed and the data will be kept up to date from month to month. Full data will also be collected concerning nearly 8,000 other institutions. A record will be kept of the number of doctors, interns, and nurses contributed by each hospital to the service.

Clinical Association of American Peroral Endoscopists.—The first annual meeting of this association will be held in Philadelphia, at the Bellevue-Stratford Hotel, on Friday, May 31st, under the presidency of Dr. Chevalier Jackson, of Philadelphia. A scientific session will be held in the morning, followed by a luncheon at the Bellevue-Stratford Hotel, and the afternoon will be devoted to clinical demonstrations in the amphitheatre of Jefferson Hospital. Dr. Hubert Arrowsmith, of Brooklyn, is vice-president of the society; Dr. Henry L. Lynch, of New York, is secretary-treasurer; Dr. Wolff Freudenthal and Dr. Samuel Iglander, members of the executive committee.

Canadian Association for the Prevention of Tuberculosis.—The eighteenth annual meeting of this association will be held in Hamilton, Ontario, Wednesday, May 29th, with headquarters at the Connaught Hotel. The morning session will be devoted to a discussion of the social and public health aspects of tuberculosis. In the afternoon a symposium on the diagnosis and treatment of tuberculosis will be presented, which will be followed by a visit to the Mountain Sanatorium, at the invitation of the Hamilton Health Association. A general session will be held in the evening. J. A. Machado, Esq., is president of the association, and Dr. George D. Porter is secretary.

Meetings of Medical Societies to Be Held in New York during the Coming Week.—Monday, May 20th, New York Academy of Medicine (Section in Ophthalmology), Medical Association of the Greater City of New York, Yorkville Medical Society; Tuesday, May 21st, New York Academy of Medicine (Section in Medicine), Federation of Medical Economic Leagues of New York; Wednesday, May 22d, New York Academy of Medicine (Section in Laryngology and Rhinology), New York Society of Internal Medicine (annual), Brooklyn Pediatric Society; Thursday, May 23d, Hospital Graduates' Club, New York Physicians' Association, Ex-Intern Society of Methodist Episcopal Hospital; Friday, May 24th, Academy of Pathological Science, Ambulanc Medical Society, New York Clinical Society, Society of New York German Physicians (annual), Brooklyn Society of Internal Medicine; Saturday, May 25th, Lenox Medical and Surgical Society (annual), New York Medical and Surgical Society, West End Medical Society.

Members in Service, Society Suspends.—The Logan Medical Association of Philadelphia, has decided to discontinue its meetings for the period of the war, owing to the fact that most of its members are serving with the Army or Navy or with the local examining boards.

National Public School Speech Teachers' Association.—The annual meeting of this organization was held in Fall River, Mass., on Thursday, May 9th, under the presidency of Dr. Walter B. Swift, clinical assistant in laryngology, Harvard Graduate School of Medicine, and medical supervisor of speech classes, Fall River, Mass.

Yorkville Medical Society.—This society will hold its final meeting for the season Monday evening, May 20th. The program will be chiefly clinical, with a paper by Dr. William C. Ihro on The Etiology of Asthma. Dr. Selian Neuhof is president of the society, and Dr. Samuel Floersheim, 170 West Eighty-sixth Street, is corresponding secretary.

Meetings of Medical Societies to Be Held in Philadelphia during the Coming Week.—Monday, May 20th, Academy of Medicine and Allied Sciences, Medical Society of Women's Hospital; Tuesday, May 21st, Mount Sinai Hospital Clinical Society, West Branch of the County Medical Society; Wednesday, May 22d, County Medical Society; Thursday, May 23d, Pathological Society; Friday, May 24th, Northern Medical Association.

Hoboken Hospital Taken Over by the United States.—St. Mary's Hospital, in Hoboken, N. J., which is situated three blocks from the government piers, has been taken over by the federal authorities for the sole use of military and naval patients. As this leaves Hoboken without a city hospital, arrangements are being made to have patients cared for at the North Hudson Hospital, at the Jersey City Hospital, and at St. Francis's Hospital, Jersey City.

Medical Association of the Greater City of New York.—A stated meeting of the association will be held in Hosack Hall, New York Academy of Medicine, Monday evening, May 20th, under the presidency of Dr. Edward E. Cornwall, of Brooklyn. The programme will include the following papers: Health and Sanitation in the Shipyards, by Lieutenant Colonel Philip S. Doane, N. A., medical director, United States Shipping Board; Medical Service at Hog Island, by Dr. J. Jay Reilly, chief surgeon; Plans for Housing of Shipbuilding Employees, by Owen Brainard, Esq.; Town Planning in England, by G. Trafford Hewitt, Esq. The papers will be illustrated by lantern slides. Dr. Thomas Darlington and the Hon. James T. McCleary, of the American Iron and Steel Institute, will open the discussion. Members of the association may invite their lay friends to this meeting.

Positions in the University of the State of New York.—Among the positions for which examinations will be held by the New York State Civil Service Commission on June 6th are the following in the University of the State of New York:

Physician and Medical Instructor in Special Departments for Men and Women. Applicants must be licensed to practice medicine in the State of New York and must have had experience in the study and treatment of tuberculosis, and special training in abnormal psychology, together with experience in the diagnosis and treatment of nervous and mental diseases; and must also be familiar with institutional methods of dealing with mental defectives and psychopathic children.

Instructor in Hygiene.—Men only. Applicants must be college graduates, licensed to practice medicine in the State of New York, and must have had broad experience in lecturing on sanitation and hygiene.

Oral Hygiene Inspector.—\$3,000. Men only. Preferred ages over twenty-one but not forty years. Applicants must be graduates of dental schools, and must have had special training from an approved dental course and should have had special training for oral hygiene work. They must also be licensed to practice dentistry in the State of New York.

Inspector in Charge of Child Nutrition.—\$2,000. Women only. Preferred ages over twenty-one but not forty years. Applicants must be college graduates who have had special training in child nutrition, and who have had experience in dealing with the malnutrition of children.

For proper application forms address the State Civil Service Commission, Albany, N. Y.

Modern Treatment and Preventive Medicine

A Compendium of Therapeutics and Prophylaxis, Original and Adapted

Revised Ideas Concerning Foot Defects and Orthopedic Footwear.—Herman W. Marshall (*Boston Medical and Surgical Journal*, March 28) presents the following points, some of which are well known, while others are not so well understood: Feet are plastic and can be moulded gradually into many different forms, especially during the earlier years of life. Foot deformities are produced most commonly by continuous wear of one style of shoes. Results of causes operating previously for prolonged periods are shown by these most common foot deformities, and the latter should not be interpreted primarily as causes for existing pains or weaknesses. A large percentage of them are not associated with pain and such feet are serviceable for ordinary requirements. Causes of abnormal weakness, pain, and disability are found most commonly in musculoligamentous weaknesses, strains, or irritations. Sharp distinctions in treatment of foot defects should be made between abnormal symptoms and foot deformities. Feet of persons in good health, who have never worn shoes, are flexible, and adapt themselves easily to innumerable unfavorable conditions. Feet of persons in good health are able to endure without injury, for variable periods of time, shoes that have pointed toes or broad ones, high heels or low ones, flexible shanks or stiff ones, shoes that are a trifle too short or long, or a trifle too wide or narrow for comfort across front parts at locations of transverse arches. Harm from high heels, pointed toes, and shoes too short or too narrow, comes only when they are worn too much of the time. Orthopedic shoes of the most approved shape and fit are defective in one important respect, that they tend to fix the feet in one position continuously, to the detriment of certain muscles and ligaments. Several slightly different styles of shoes, with variations in widths and flexibilities, are preferable to a single shape and size of the most correct orthopedic last for individual wear, because slight accommodative changes required in use of several different pairs of shoes of different proportions assist in retention of normal flexibility and adaptability. One of the styles should be the usual foot shaped orthopedic shoes. When this ability of feet to make moderate changes without discomfort is lost, prompt attention should be given to developing musculoligamentous defects. Causes of musculoligamentous defects include too much mechanical use of the feet, harmful variations in blood supplying muscles and ligaments, and defective nervous control of these tissues, acting together. Vascular causes of musculoligamentous defects are obscure and numerous. Clinically, musculoligamentous weaknesses or irritations are noticed after prolonged illnesses, in connection with infections of tonsils, teeth, nasopharynx, and genitourinary tract, in cachectic states and diseased conditions, and before and after childbirth. The most common vascular origin for mild transient foot symptoms probably is found in the numerous

transient mild autointoxications and debilities arising from combinations of overwork, worry, high nervous tension, overeating, and other accompaniments of modern complex life. Painful foot symptoms are indicators of underlying, often unrecognized troubles, which may be more serious than the resultant foot disability. In many of these cases relief ascribed to a shoe is really due to the correction of a debility. Practitioners' limitations in care of patients' feet are appreciated by practical shoe men, some of whom have a very complete knowledge of local foot troubles. The selection of shoe fitters should be made as carefully as selections are made of physicians for treatment of foot troubles. Few manufacturers have yet succeeded in constructing a series of shoes on correct orthopedic principles, and it is exceptional to find fitters in retail stores who have proper understandings and proper stock to fit from. Physicians have to know how to apply supports, correct general systematic defects, and understand the possibilities and limitations of shoe fitting. As only one important omission or mistake is needed to impair success, the reason is obvious why many imperfect results are obtained. Deformities are not devoid of significance, although they represent effects of past influences rather than causes of present troubles. They should be corrected as far as practicable, keeping in mind the relative importance of degrees of defection that are being remedied, as they cause the feet to work at a mechanical disadvantage. Orthopedic corrections of foot deformities can be as uncomfortable as repeated "breaking in" of shoes in the past which produced the structural defects. It is well to explain to patients that corrective orthopedic appliances or shoes are not designed for increased comfort, but to slowly force the feet back into normal shape as rapidly as tolerance will permit. Corrective apparatus should not be forced vigorously with feet that are showing symptoms of acute strain. Instead, strained feet should be comfortably supported with adhesive straps, blood peculiarities be attended to, and, when abnormal symptoms have abated, a gentle beginning be made toward corrections. Manipulations, exercises, and massage should not be omitted in the more chronic types of foot troubles. New treatments will be devised in the future, and may be essential for special cases, but the large majority of foot cases are likely to be treated more successfully in the future mainly through wider spread greater efficiencies in the use of facilities now at hand. Special situations can be cleared up in many instances only by puzzling over the facts already established, as, for example, employment of a single style of shoes for all men in the United States Army, while multiple styles of footwear are advocated by most progressive shoe dealers. Surgical treatments for deflected toes give satisfactory results in many long standing cases of severe grade, but many can be improved by nonoperative methods.

Penetrating Wounds of the Brain.—Harvey Cushing (*British Medical Journal*, February 23, 1918) draws from his experiences at three contiguous casualty clearing stations which were set aside for the reception and treatment of all head injuries during a period of activity. During the first two weeks of the period, 23.5 per cent. of the cases admitted with head wounds had penetration of the dura, while of the total number of cases verified by operation the percentages with dural penetration was a little over forty-nine. Of the verified cases about a third died without operation, while of the remaining two thirds, all of which were operated upon, one half died, giving an operative mortality of fifty per cent. Efforts were therefore made to reduce this mortality of about fifty per cent. by proper supervision of each case from start to finish, and by the development of an improved operative plan. That this was accomplished is shown by the results obtained in the entire series of cases of penetrating wound which were operated upon, considered in consecutive thirds. The mortality in the first forty-four cases was 54.5 per cent.; in the second forty-four, 40.9 per cent., and in the third forty-five it was only 28.8 per cent. There was no selection of the cases, except that as the results improved there was a tendency to include such severe ones as would not previously have been considered. The improved results were due very largely to the development of a general technic, the main points of which were: Excision *en bloc* of the area of cranial penetration, instead of piecemeal. Detection of indriven fragments of bone by palpation of the track with a soft catheter instead of the finger. Cleansing of the tract and removal of the disorganized brain by suction, and the use of oily solutions of dichloramin T for the brain. Several other points contributed to the success, such as the careful preoperative neurological study of the case; shaving of the entire head; the taking of stereoscopic x-ray negatives; the invariable use of local anesthesia, combined with omnopon; the use of a radial tripod incision; magnet extraction of foreign bodies where possible, and the closure of the wound with buried sutures in the galea.

Treatment of Wounds of the Chest.—William Hutchinson (*British Medical Journal*, February 10, 1918) divides wounds of the chest into four classes for the purposes of discussing treatment. The first class includes only uninfected hemothorax or pneumothorax, and its treatment consists merely in aspiration of the blood whenever there is more than two fingerbreadths of dullness. To prevent discomfort and distress, the site of puncture should be anesthetized through to the pleura and a short skin incision made. A fair sized trocar and cannula should be employed, and the blunt cannula be moved about without risk of injury to the lung. Where air is present the aspiration should be made very slowly to prevent distress, and where distress arises from the too rapid removal of blood a little air should be allowed to enter from time to time. If the blood has become clotted the chest should be opened, the clot removed, the chest closed, and the air aspirated. The second class is that of open pneumothorax, and the treatment should include

thorough cleansing of the wound, lavage of the pleural cavity with saline solution, and closure of the chest cavity. If infection seems likely, ninety mils (oz. iii) of a 1:5,000 solution of flavine should be left in the pleural cavity when it is closed and the aftertreatment carried out as for infected hemothorax. The third class includes the cases of infected hemothorax, the existence of which should be proved clinically as well as bacteriologically, and it should be treated by resection of sufficient length of rib to permit the introduction of the hand. The operation should be done under gas and oxygen anesthesia and should be performed as soon as the diagnosis is made. The blood clots are removed by hand, the fluid allowed to flow out, all parts of the cavity explored, and light adhesions freed. The cavity is then completely cleaned with large gauze mops, washed out with saline, and the mopping repeated. The pleura and intercostal muscles should be included together in the running suture which is then placed, and before tightening this suture an emulsion of "bipp" in liquid paraffin (one part of "bipp" to twelve of paraffin) should be introduced into the cavity and spread out over its walls with a piece of gauze. The suture is then drawn tight and the outer muscles and skin closed. After forty-eight hours the chest should be aspirated and this should be repeated three or four times during convalescence. In more resistant cases daily filling of the well drained pleural cavity with a 1:3 solution of eusol should be substituted.

Gunshot Wounds of the Knee Joint.—Kellogg Speed (*Annals of the N. Y. Acad. Med.*, 1918) believes that every gunshot wound of the knee joint should be operated upon as soon as time and circumstances permit. With the leg suspended from the table the skin should be shaved and sterilized. The track of the missile should then be carefully and completely dissected out with a sharp scalpel and fragments of comminuted bone or of missiles removed. If a foreign body is buried in the bone it should be removed together with a zone of the surrounding damaged bone. The synovial surface should not be sponged, irritated, or exposed for any longer time than absolutely necessary. The joint may be irrigated with sterile normal saline if desired, but the addition to this of antiseptics does not seem of any value. The wound is then closed in layers, the first providing perfect closure of the synovial cavity. If necessary a small drain can be left in the outer wound, extending only to the closed synovial cavity. The extremity should then be immobilized by a Buck's extension in a Thomas' splint. Where infection has developed in a knee joint, either because of lack of operation or following it, an effort should be made to save the patient's leg by providing free drainage. This is possible by incising the anterior reflection of the subcutaneous bursa at its upper limit and inserting a small rubber tube. The patient should then be made to lie prone for increasing periods of time, beginning with two hours night and morning, to permit of free escape of the contents. Where extensive erosion of cartilage has already occurred, or late in the course of infections of the knee, amputation should be made as soon as the leg has an opportunity should be performed at once.

Technic of Carrel-Dakin Treatment.—G. E. McCartney and F. H. H. Mewburn (*British Medical Journal*, February 9, 1918) believe that in order to secure the greatest measure of success with this treatment certain technical details must be attended to closely. The solution should be prepared fresh daily and tested by the surgeon for its hypochlorite content before the addition of the potassium permanganate. If the test is satisfactory the permanganate should be added and the solution stored in a dark closet in bottles covered with canvas which is impregnated with a brown stain. The most suitable strength for use lies between 0.46 and 0.485 per cent. of hypochlorite; stronger solutions tending to produce a white, scalded appearance of the wounds. The skin about the wound should be thoroughly protected from the solution by means of properly prepared vaseline pads. These should be made of strips of cheesecloth six by four inches, immersed in hot vaseline, the surplus vaseline allowed to drain off and the strips packed in a tin box with a perforated lid. This is then wrapped in a towel and sterilized by heat. Such pads are thoroughly impregnated and adhere to the skin perfectly. The Carrel tubes should be syringed out with warm water after use, scrubbed with a brush, soaked over night in Dakin's solution, washed with ether and boiled for half an hour in a solution of caustic soda. The dressings should all be done with the same measure of surgical asepsis as one would observe in opening a normal joint.

A Note on Splints.—P. L. Watkin Williams (*Lancet*, February 23, 1918) emphasizes the fact that the absolute fixation of the whole limb for injury to one of its parts results frequently in stiffness and immobility of one or more of the joints, and is essentially wrong in principle. In order to avoid the fixation of the joints, he has devised several simple splints which provide adequate fixation of the injured part, with enough freedom of movement of the joints to prevent stiffness and maintain normal function. The splints also provide comfort, permit free access for dressings, and are simple and cheap. For the upper extremity, an internal and external rod for the arm are fixed to a ring for the shoulder. The anterior portion of this ring is rigid, while its posterior and axillary portions are made of a padded rubber sling which provides the counter traction against the extension bands which are attached to the lower end of the frame. The lower ends of the two bars of the arm frame terminate below the level of the elbow, and to them is attached a similar frame for the forearm in such a way that a hinge joint is formed. Active and passive movements are thus permitted at the shoulder, elbow and wrist without interfering with fixation of either the arm or forearm. For the lower extremity, the thigh frame is a Hodgen cut off a little below the level of the knee, and the leg frame is the lower two thirds of a Hodgen which is hinged to the thigh frame at the knee. Thus a full range of movement is secured for all the joints. The use of the splint for the lower extremity is combined with separate suspension of the thigh and leg, and extension of the thigh by weights and pulleys.

The Treatment of Fractures of the Extremities by Means of Suspension and Traction.—Joseph A. Blake and Kenneth Bulkley (*Surgery, Gynecology and Obstetrics*, March, 1918) state that all wounds and fractures of the leg repair far more quickly if the limb is suspended, and this should be always done. The Hodgen's splint bent to an angle of 135° is employed. The leg is suspended in the splint by the usual bands and the splint suspended above the bed by the trolley. Fractures of the fibula alone are of little consequence, being well supported by the tibia. They are suspended because of the improvement in circulation and for the dressing of wounds, but no traction is necessary. Fractures of the tibia alone are splinted by the fibula and are prevented from overriding to any great extent, but incurvation is common. A slight traction of one or two kilos will correct this tendency. Fractures of both bones demand more care. Here traction of three or four kilos is necessary. Fractures of the tarsus and metatarsus are also commonly treated by suspension largely for the improvement in circulation obtained and the consequent more rapid healing. In fractures involving the ankle joint, traction by means of a Sinclair-Smith "skate" is used.

Treatment of Pleuritis and Empyema.—G. P. La Roque (*Virginia Medical Semi-Monthly*, January, 1918), referring to pleuritis after pneumonia, recommends watchful waiting for proper encapsulation of the pleural exudate until accessible to needle puncture exploration, as a safer procedure than exploratory thoracotomy across a nonsuppurating pleural area, with its fifty per cent. mortality. Rest in bed, opiates to secure rest of breathing, local applications, plenty of fresh air and sunshine, and self restraint on the part of the surgeon will practically always lead to walling off of pus, after which puncture can be performed within an area three inches in diameter, with its centre at the seventh interspace just behind the axillary line. In aspirating, a large needle attached to a large record syringe, provided with a double stopcock for withdrawing and expelling the fluid, may be appropriately employed. In young children, unless the pus is thick and yellow, this is frequently all that is necessary. In adults and others, when the pus is thick, La Roque commonly irrigates through the needle, injecting and evacuating saline solution with the aid of the double stopcock until the fluid returns clear. In the presence of very thick pus he plunges a gallbladder trocar through the interspace, and irrigates with saline solution or a weak solution of iodine. In such cases, a linear incision through the interspace under local anesthesia will permit of introduction of two small calibre rubber tubes, pinned together and sutured to the skin. In from one to three weeks the drainage has ceased and the incision healed. By this treatment he has obtained 90 per cent. of cures without sinus formation, and had no mortality due to the disease. He deems rib resection unnecessary as well as unsafe, conducive to sinus formation, and a hindrance to healing. In an occasional case the necessity may arise for intercostal incision and rib spreading according to the technic of Lilienthal as a second operation.

A Cyllin Mixture in Intrathoracic Sepsis.—W. Gordon and M. E. Gates (*British Medical Journal*, February 9, 1918) add two more cases, and mention a third, in which they have obtained very satisfactory results from the use of the following mixture:

Iodoform,	0.3 (gr. v);
Cyllin,	0.3 (min. x);
Olive oil,	0.3 (min. v);

Their first case, reported some years ago, was one of the apparent cure of pulmonary gangrene by injection into the lung tissue of this mixture. The two now reported are of foul, septic empyema, both of which seemed to respond most favorably to the packing of the cavity with gauze soaked with the mixture. A third case is mentioned in which intrathoracic sepsis following a gunshot wound responded well to the treatment.

Telephone Deafness.—George Cott (*Buffalo Medical Journal*, April, 1918) calls attention to several cases in which persons when they put the telephone receiver to the ear suddenly heard a loud, high pitched sound, and then could hear nothing more, the deafness persisting for a considerable length of time. His explanation of the cause of this deafness is that any interference with the line while one is listening may jar the auditory nerve suddenly, and induce a high pitched sound, followed by prolonged tinnitus with immediate deafness, either partial or total; the symptoms ameliorating after some weeks. This accident can be avoided, because it occurs only when the listener holds the receiver in such contact with the ear that no external sound can enter, a common way to hold the receiver when there is much noise around. If the user of the telephone applies the receiver in such a way that a space is left for free circulation of air between it and the ear, a shock cannot be transmitted to the nerve, no matter how much disturbance there may be on the line.

Modified Technic of Cesarean Section with Hysterectomy.—E. A. Selumann (*American Journal of Obstetrics*, February, 1918), in the presence of indications for some form of Cesarean section, considers hysterectomy the operation of choice where there is infection—as shown by fever and leucocytosis—where there has been marked traumatism to the lower uterine segment, or when the pregnancy is associated with salpingitis. After the usual low median incision, he everts the uterus, covers it with a hot, moist towel, and has it held sharply forward by an assistant. Peritoneum, muscle, and fascia are then sutured permanently up to the posterior surface of the everted uterus. The small circular opening around the cervix where the uterus protrudes is next caulked with a gauze sponge, the uterus opened by the intertubal incision of Fritsch, and the fetus extracted. The ovarian and uterine vessels are ligated, the broad ligaments cut, and the uterus amputated at the cervix with the actual cautery, leaving an ample stump. The latter is now drawn together by continuous or interrupted sutures, the openings in the broad ligaments closed, the gauze packing round the cervix withdrawn, and the parietal peritoneum sewn around the closed off uterine stump, leaving it entirely extraperitoneal. Closure is then com-

pleted, the skin and muscle covering the cervical remnant, and a very small strip of gutta percha or rubber dam is carried through the lower angle of the incision to the stump. In this operation the general peritoneal cavity is not soiled by liquor amnii, the tissues of the presumably infected uterus are sealed with the cautery knife, the cervix is kept extraperitoneal, and no sloughing area to be healed by granulation is left. The operation takes no more time than the usual form of Cesarean section, and subjects the child to no greater risk.

Nitrogen and Cancer.—John Thompson Shir-law (*Practitioner*, March, 1918) is inclined to believe in a causal connection between the development of cancer and the failure of the functional activities of the spleen and lymphatic glands, which results in a slow and gradual accumulation of nitrogen in the blood and tissues. Based on this theory, the treatment of cancer suggested is to supply the ferments which normally act on nitrogenous bodies, that is, to give the patients extracts of the spleen and of the lymphatic glands. He reports a case of clinically diagnosed carcinoma of the duodenum in a woman of seventy which has been treated solely with five grain capsules of splenic extract for eighteen months. At one time she was so ill as to be thought dying, but steadily improved under the treatment, put on flesh, and finally walked a distance of ten miles. The diagnosis could not be made with certainty, but the tumor was easily palpable, and he feels confident that the diagnosis was correct. While not claiming that the case proves the success of the treatment, it seems to furnish encouragement.

Acidemia and Treatment of Gas Gangrene.—Abraham F. Wenzig and Alexander Fleming (*Journal*, February 9, 1918) record their observations which show that a reduction in alkalinity of the tissues or blood greatly favors the multiplication of the several gas forming bacilli, and, further, that the growth of these organisms tends to produce an acidemia and a local reduction of alkalinity. Their predilection for dead or badly injured muscle is also due to the fact that such muscle has a reduced alkalinity. These observations lead the authors to recommend the practice of intravenous infusions of five per cent. sodium bicarbonate solution in amounts of 500 mls at a time. This should be followed by an after-treatment with the lactate of soda by mouth to keep the urine alkaline. The lactate of soda is chosen because it is well borne by the stomach and promptly converted into the carbonate after absorption. It cannot be used at the outset owing to the presence of nausea and vomiting. When operation is necessary it should be preceded by the administration of a sodium bicarbonate infusion and nitrous oxide and oxygen or warmed ether should be the anesthetics, preferably the former. Finally the local wound or the amputation stump should be treated with five per cent. solution of sodium chloride to promote the exudation of lymph and thus to raise the local alkalinity. The results of this plan of treatment have been good, and it is suggested that it may even forestall the development of acidemia if the infusions of alkali be started very early. Frequently, inoperable cases are rendered operable by the intravenous infusions.

Climate in Tuberculosis.—H. F. Gammons (*Boston Medical and Surgical Journal*, March 14, 1918) says that a persons with an ulcerative case of tuberculosis who has given his home climate a chance, and at the same time has coupled the climate with other standard treatments for tuberculosis, such as fresh air at all times, rest, diet, and contentment of mind, and who is at a standstill, will, if he is financially able, unquestionably obtain good results in the Southwest. It is necessary, however, for such a patient to have all other factors accessory to the cure, such as rest, diet, etc. If one is fortunate in being able to take the cure in one of the sanatoria of his vicinity under the proper regulations, it is better than to go to the Southwest and be compelled to care for one's self or to rough it.

Systematic Therapeutic Exercises in Hemiplegic Paralysis.—Robert Oden (*Journal A. M. A.*, March 23, 1918) points out that general massage treatment has failed to give satisfactory results in the improvement of the paralysis in hemiplegia largely because all of the muscles of the affected parts were treated indiscriminately. On the other hand, the proper application of massage methods and exercises so as to stimulate the weakened muscles and relax the contracted ones, when carried out intelligently and persistently, was productive of strikingly favorable results even in cases of very long standing. The several methods to be applied and their indications are discussed in the paper and the results of such treatment in a number of cases are recorded to show the benefit which can be secured in cases which have shown little or no improvement under general massage. The contention as to the value of the proper application of the methods is supported by the results of experiments on artificially hemiplegic monkeys.

Stretching of Muscles and Nerves after Nerve Severance.—N. J. Langley (*British Medical Journal*, February 2, 1918) calls attention to the commonly accepted dictum that all stretching of a paralyzed muscle after severance of its nerve must be avoided, and brings forth evidence to show that the intermittent stretching of paralyzed muscles to their normal extent does not appreciably promote their atrophy. On the other hand, such mild, intermittent stretching by movements of the joint upon which they act may be beneficial to the muscles, both by keeping the joint mobile, and by preventing contraction of the muscles and aiding in maintaining their nutrition and removing waste products. With reference to the effect of such intermittent stretching on the nerves, the evidence indicates that it is not harmful and is probably decidedly beneficial in the period before nerve suture. After nerve suture, where there has been no shortening of the nerve, slight movements should be begun in a few weeks. These do not jeopardize the nerve's union, they prevent joints stiffening, aid nutrition of the muscles, and tend to elongate the connective tissue which binds the nerve to its neighboring tissues. Where the nerve suture has been accompanied by a reduction in the length of the nerve no movements should be made until there is reason to believe that the union is very firm, and then they should be started very gently and be very limited in extent.

Sealing Medication in the Urethra.—Edgar G. Ballenger and Omar F. Elder (*Journal A. M. A.*, March 23, 1918) strongly recommend the practice of sealing the medication in the urethra in acute cases of gonorrheal infection as well as for the purpose of prophylaxis after exposure. The patient should be reclining, the penis washed and dried and surrounded with a sterile towel. Twenty-five minims (1.6 mil) of the drug are injected with a blunt pointed syringe and the urethra compressed with the hand to prevent escape. The meatus is dried and sealed by the application of plain collodion over it and for about a quarter of an inch around it. The urethra is kept compressed until the collodion has dried and a condom, containing a little absorbent cotton, is drawn over the penis to prevent soiling of the clothes should the collodion be broken. Before treatment the patient should have avoided taking fluids and should have emptied his bladder so as to be able to retain the medication for several hours. Then he can crack the collodion by pressure, remove it, and empty his bladder, after which he should drink copiously to flush out the urethra. The treatment should be repeated every morning for about five days unless the discharge continues or increases or organisms can be found in it after the third day, all of which indicate that infection has spread beyond the reach of the medication. By this treatment acute anterior urethritis can be cured within five days in the majority of cases if the treatment is begun on the first day. It is suitable only for cases with infection limited to the anterior urethra or as a prophylactic against infection if used within forty-eight hours of exposure.

Antenatal Treatment of Congenital Syphilis with Salvarsan.—Leonard Findlay (*Glasgow Medical Journal*, February, 1918) notes that if thorough treatment with mercury and potassium iodide is instituted early in a pregnant syphilitic mother, a healthy and nonsyphilitic infant will usually result. According to Pinard, Champetier de Ribes, and Potocki the percentage of healthy infants thus obtained is 75.9. A drawback to this method is that if the treatment is interrupted after delivery, and not reinstituted during the next pregnancy, the subsequent child will almost certainly be syphilitic. Even when applied thoroughly, the method was not invariably successful in the author's cases. Antenatal treatment with salvarsan is far superior. Not only does it seem possible to start the treatment much later, and yet be successful, but apparently salvarsan enables the mother, in the absence of further treatment, to continue to bear healthy children to the same—untreated—father. Injecting neo-salvarsan intravenously in seven pregnant women. Findlay secured a healthy child in each instance. Five of these women have since been pregnant once again, and three twice, and apparently in all instances with delivery of a healthy infant. In no case had any subsequent treatment been received, except in one, which had irregular treatment. All the cases received mercury either by injection or *per os*, along with the salvarsan. Findlay urges that all records of miscarriages and stillbirths be kept, those due to syphilis determined, and the syphilitic mothers given salvarsan and mercury.

Miscellany from Home and Foreign Journals

Serum Sickness.—E. W. Goodall (*Lancet*, March 2, 1918) presents a study of the clinical aspects of serum sickness as seen in 3,502 cases following the use of diphtheria antitoxin. There are three distinct forms of serum sickness. The first occurs after primary injections of serum; the second in persons who are reinjected more than ten days after a primary injection; the third after primary injections in rare, susceptible persons. The first form is by far the most frequent, and its commonest manifestation is a rash, generally urticarial or erythematous. A rash occurred in thirty-five per cent. of 8,726 cases of diphtheria which recovered. The rash sometimes appears first in the region of the injection, and it has a predilection for the extensor surfaces of the extremities. Two rashes may appear, separated by a free interval, and if one is urticaria and the other erythema, the urticaria usually appears first. Two different rashes may result from even a single dose of serum. The rash very seldom appears before the sixth day after the first injection, and is uncommon after the fourteenth day; the days of greatest incidence being the eighth, ninth, and tenth. No cases have been observed developing before the third day. Children are more often affected than adults, specially in the male sex. The rash may last from a few hours to a few days. With the rash there may or may not be other symptoms. These include transient fever, moderate glandular enlargement, tonsillitis, slight edema of the skin, sweating, vomiting, albuminuria, rarely hematuria, and transient joint pains or arthritis. There is also a leucopenia due to a reduction in the polymorphs. The second type occurs in those who have been made hypersensitive by previous serum injection. Sensitization never develops in less than ten days, and its duration is not known, but there is reason to believe that it varies and may persist for life. There is no particular time after which sensitiveness is likely to have disappeared or diminished. The serum sickness in this type may be precisely like that just described, but commonly it differs in one or more respects. The commonest change is shortening of the latent period, seventy-one out of 129 of such reactions having occurred either on the same day or on the day following the injection; that is, fifty-five per cent. had a latent period of less than two days. The reaction may be immediate (within six hours) or accelerated, the latter being the more frequent, and both may occur in the same patient. The second point of difference is that they may be much more intense and the mucosæ of the respiratory and digestive tracts may be involved in the urticaria. The third point of difference is the occurrence of such unusual symptoms as rigors, muscular twitching, convulsions, drowsiness, dyspnea, collapse, vomiting, and high temperature. The third class of serum reactions resembles closely the second in all respects, except that the victims have never before received serum. The persons so involved seem to have a sensitiveness to horse proteins, and many have horse asthma. Such cases are, fortunately, rare.

Serum Sickness and Anaphylaxis.—E. W. Goodall (*Lancet*, March 9, 1918) says that there has been a disposition to include ordinary serum sickness among the examples of anaphylaxis. He points out that the symptoms of anaphylaxis are constant for any given species of animals, irrespective of the protein used for sensitization and reinjection. Anaphylaxis is known to occur only in previously sensitized animals, while the ordinary form of serum sickness occurs without any evidence of previous sensitization. Only that form occurring after an interval following a previous injection of the same serum should be rightly classed as true anaphylaxis. This form has definite symptoms and manifestations which may be taken as typical of the human anaphylactic reaction. These symptoms include urticaria, blotchy erythema, edema of the skin, occasionally edema of the mucous membranes, respiratory embarrassment, and occasionally collapse. Such symptoms are also encountered in some cases of food poisoning and insect bites. Such manifestations as sometimes follow severe burns, some of the symptoms in exophthalmic goitre, migraine, and epilepsy, and certain instances of drug susceptibility have been regarded by many as anaphylactic, but this is not justified by the symptoms or the facts associated with true anaphylaxis. The symptoms of acute infectious diseases have been explained as due to anaphylaxis from sensitization to the bacteria during the incubation period, but the nature of the symptoms is more or less specific for each disease, is not uniform, and they do not resemble those of true anaphylaxis. This view would therefore seem to be unwarranted. The occurrence of the so called secondary rashes in the acute infectious diseases, however, does fit the description of true anaphylaxis, and these rashes are probably instances of that condition.

The Pneumonias: Streptococcus and Pneumococcus Groups.—James G. Cumming, Charles B. Spruit and Charles Lynch (*Journal A. M. A.*, April 13, 1918) present the results of their investigation of the pneumonias with reference to the causative organisms. Cultures were made from the throats in measles cases, and 187 of the 291 cultures showed streptococci of the hemolytic Types I and II. Twenty-five of these patients developed complications, among which there were five cases of bromopneumonia. Of 104 swab cultures showing Type III hemolytic streptococci, fifty-one developed complications, there being bronchopneumonia in thirty-four, empyema in nine, lobar pneumonia in one, and one case of pleurisy with effusion. That is among the measles patients thirty-five per cent. were carriers of the hemolytic streptococcus, and of these thirty-three per cent. developed streptococcus pneumonia. There were only six per cent. of hemolytic streptococcus carriers among seventy average throats. Positive blood cultures of the hemolytic streptococci were obtained in seventeen per cent. of the measles pneumonia cases. Of forty-one lobar pneumonia cases streptococcus, Type III hemolysis was obtained in fifty-nine per cent. of the cultures of the pleural exudate taken during life, and forty-

seven per cent. showed pneumococci. Eighty-six per cent. were streptococci among the cases of bronchopneumonia. At necropsy in thirty-one cases of lobar pneumonia, bronchopneumonia, and measles pneumonia the streptococcus was isolated in pure culture in eighty-four per cent., and along with the pneumococcus in just under ten per cent., or in ninety-four per cent. of all the necropsies. The hemolytic streptococcus seemed to have been the cause of death in ninety-four per cent. of the thirty-one autopsied cases, including those of lobar pneumonia. Either throat swab or sputum cultures were positive in 100 per cent. of cases of pneumonia following measles, the former being positive in seventy-six per cent., the latter in eighty-seven per cent., and both in fifty-five per cent. These observations show the great importance of the recognition of the hemolytic streptococci in pneumonia of all forms, and this recognition is not possible when the mouse test for pneumococcus type determination is employed. It is possible only by culture of the streptococcus. The findings would seem to demand the reclassification of pneumonias into the streptococci and the pneumococci, with the further subdivision of the latter into its four types. Efforts have been inaugurated to classify the hemolytic streptococci, and treatment of the pneumonias by prophylactic inoculation of hemolytic streptococcus vaccine or use of polyvalent antistreptococcal serum is being tried. Cubicle isolation is essential to prevent the spread of the streptococci by droplet dissemination.

Pneumonia at a Base Hospital.—Rufus Cole and W. G. MacCallum (*Journal A. M. A.*, April 20, 1918) studied a considerable number of cases of pneumonia, both clinically and pathologically and found that there were two very distinct types of the disease. The one was the usual lobar pneumonia, similar to the disease as encountered in civil life, and was of low mortality. The other was a lobular or bronchopneumonia which occurred as a complication or sequel of measles, was of very high mortality, and was due to infection with a hemolytic streptococcus. In every case of this type of pneumonia examined post mortem this streptococcus was isolated, usually in pure culture, from the heart's blood, the lung lesions, pleural exudate, or other tissues. In many of the cases the same organism was present during life in the sputum and in a few also in the blood. The clinical picture of this form of pneumonia began with cough, fever, slight respiratory distress, and mucopurulent sputum. Sometimes there was an interval between the fall of the fever due to the measles and at others there was none. In all cases the onset of the pneumonia was gradual. The symptoms of the developed disease were moderate fever, seldom above 104° F. and often irregular, especially when empyema was present; moderate acceleration of the pulse; and characteristic respiratory distress. The respiratory interference appeared to involve inspiration so that there was marked use of the accessory muscles and evident conscious effort. The rate was not very rapid. Cyanosis of marked degree was always present, even in the early stages. Cough was troublesome and accompanied by sputum which varied in different cases, but never was like that of

lobar pneumonia. Restlessness and pain in the chest were also common. The physical signs, like those typical of bronchopneumonia in general, were not very distinctive. The commonest complication was empyema, which proved very fatal. Investigation showed that the infection with the streptococcus was apparently acquired by the measles patients during their stay in the hospital as the organism was relatively infrequent in the throats of the patients at the time of their admission and in the throats of their camp associates.

Bacilli and Spinal Fluid in Tuberculous Meningitis.—D. P. West (*Virginia Medical Semi-Monthly*, February, 1918) describes a modified technique by which the chances of success in discovering the tubercle bacilli are increased. The aim is to get the film from the spinal fluid out and onto a cover glass without, as in the ordinary method, having to handle or tease it—procedures which merely knot the film together. Fluid is received in several tubes, five or six mils in each. All shaking of the fluid is avoided, as it reduces the chances of film formation. The fluid is incubated or refrigerated for twelve to twenty-four hours, as necessary. In marked cases the film will often form in a very few hours. It is attached to the bottom of the tube, and also at the top of the fluid, assuming usually an hourglass formation. One quick turn of the tube between the palms of the hands is usually sufficient to detach the film and cause it to float free in the fluid. Half of a petri dish is now held slightly slanting, a cover glass placed in its dependent portion, and the fluid and film poured out into the dish and onto the cover glass. The cover glass is pushed with a laboratory needle up toward the shallow part of the fluid until the film still floating free in the fluid engages one corner of the cover glass. The fluid is then drained off by tilting the dish still further, allowing the film to settle, fanlike, over the cover glass. Finally, the cover glass is picked up with forceps, stained, mounted on a blood slide, and examined.

The Coin Test in Pleurisy.—P. Lereboullet (*Paris médical*, January 5, 1918) states that this test deserves more attention than it generally receives, as it affords one of the best presumptive indications of pleural effusion, and its simplicity commends it to the busy practitioner. The examiner's ear is applied at a point on the chest opposite to that at which the coins are being struck, and the ear not used in listening should be closed with the finger. Through healthy or normally aerated lung tissue the sound heard seems distant and dull, while over fluid or homogeneous solid tissue, a sharp, clear, silvery, metallic sound is noted. Generally there is a definite line of demarcation between the sound heard over lung tissue and that over fluid. Over the lower portion of the right lung the liver, being homogeneous and solid, may yield the metallic sound even in the absence of effusion. This sound also occurs physiologically at the base of the left lung, where the coins are struck over the area of cardiac dullness. The sign is, therefore, not reliable below the point of intersection of the tenth rib with a vertical line midway between the spinal column and the posterior axillary line. Lereboullet deems

it best to place the coin over the lower end of the sternum, or even in the suprasternal fossa, in or slightly to the left of the midline. Meanwhile, the examiner listens posteriorly over both lungs in alternation, at successive points covering the entire length of the organs. Exceptionally in very large effusions the sign may be absent. Again, a positive test may be obtained where the lung is consolidated in its entire thickness, and in rare cases of encysted pleurisy with old, firm adhesions binding down the lung. Generally, however, the positive test means a liquid effusion, and the level at which it becomes negative shows the height of the fluid, especially upon listening within the inner margin of the scapula. Often the test reveals fluid where the first or second exploratory puncture has been negative. The author has lately found it very useful in the detection of hemothorax following wounds of the chest. Often it showed the upper limit of the bloody effusion.

Psychiatric Aspects of Pellagra.—William C. Sandy (*American Journal of Insanity*, April, 1918) thinks the mental features of this disease are not appreciated at their true value. Various neurological symptoms accompany the picture—paresthesias, paralyses, and tremors, and many of the patients are of the precox type, the mental symptoms varying with the individual psychology; the most common type of associated psychosis being the infective exhaustion; the clinical appearance of which is like the "typhoid state." A manic depressive like reaction is not uncommon, being about equal in frequency to dementia precox. There have been several pseudoparetic syndromes, but laboratory tests were negative. It is often difficult to determine the relation between pellagra and the psychosis.

Nature and Symptoms of Cardiac Infection in Childhood.—F. J. Poynton (*British Medical Journal*, March 2, 1918) advocates a close analysis and thorough understanding of cardiac infection in childhood, as this points the way to rational treatment of heart affections, *i. e.*, prevention. Textbooks and general teaching have given undue emphasis to the mechanical factors found in later life rather than to the response of the heart to infection. Of the several infections which may involve the heart the most important is rheumatism. The study of the manifestations of rheumatism in childhood is the study of the introductory chapters of cardiac disease. The first generalization to be made is that the severity of the resulting cardiac affections depends upon the virulence of the rheumatic infection, and the element of virulence is more important in prognosis than the physical signs in the heart. The infection may take place through the tonsils, and acute tonsillitis should always call for careful examination of the heart. It must be remembered that there is no characteristic form of throat infection in rheumatism, but that any type of infection may be rheumatic. Chronic adenoid vegetations are important in this connection also. Arthritis of various forms, chorea, and less well defined nervous disturbances in children are also commonly of rheumatic origin, and their presence demands examination of the heart. The same is equally true of a number of skin manifestations,

general wasting, anemia, obscure persistent fever, subcutaneous nodules, and such abdominal symptoms as bilious disturbances, distension, appendicitis, etc. It should be remembered that not only is anemia a manifestation of rheumatism, but also the presence of anemia tends to favor the development of the malignant forms of endocarditis. The pathological lesions of the disease, as found in the heart, are similar to those found in other tissues.

Disappearance of Aortic Regurgitant Murmur.

—W. Gordon (*British Medical Journal*, March 2, 1918) records three cases of early aortic insufficiency in which the murmur partly or completely disappeared upon sustained deep inspiration. This occurred in both standing and recumbent positions. As an explanation of the phenomenon it is suggested that the inspiration reduced the elastic recoil of the aorta and that the holding of the breath increased the volume of the pulmonary capillaries and diminished the filling of the left heart and aorta, both of which reduced the pressure which normally acted to cause the regurgitation of blood.

Systolic Murmur in Cardiosclerosis.—Selian Neuhoef (*Journal A. M. A.*, April 20, 1918) records the not infrequent observation of a characteristic, loud, rough systolic murmur in cases of typical cardiosclerosis occurring both in the aged and in those in middle life. The murmur is heard over a large portion of the anterior chest. It is specially loud over the right side of the base of the heart, declines in intensity over the midsternum, and increases at the apex and to the left. It seems to be made up of an aortic and a mitral component, the former probably being due to deformities and thickening of the aortic cusps and calcareous deposits in the aortic wall, the latter to degenerative changes in the mitral valve and ring.

Superficial Elastic Fibres in War Wounds.

—P. Masson (*Chirurgie moderne*, February 14, 1918) studying the histological changes taking place in wounds, found that in the process of natural cleansing which the injured tissues undergo, the broken and dislocated elastic fibres in the affected area are thrown off along with the other cells destroyed. Later, when the wound cavity becomes filled with granulation tissue, the elastic fibres are not at first to be found beyond the margins of the uninjured true skin. The regenerated epidermis, thin and without papillae or glandular organs, rests on the old dermis, but reveals no elastic fibres. The latter begin to reappear only after three or four months, at first in the depths of the connective tissue scar, then gradually nearer the surface. After eight or nine months the elastic fibres are very numerous but very tenuous, forming a fine network in the interstices between the main connective tissue fibres. Like the latter, they are for the most part parallel to the overlying skin surface. At intervals, however, there are pencils of elastic fibres curving down toward the basal layer, in which they terminate. These observations account for the fragility of scars in general, especially those established in granulating wounds. A histologic and mechanical argument is afforded in favor of the primary or secondary suturing of war wounds, thus leaving merely linear scars.

Proceedings of National and Local Societies

NEW YORK ACADEMY OF MEDICINE.

Stated Meeting Held February 21, 1918.

Section in Pediatrics.

The First Vice-President, Dr. G. D. STEWART, in the Chair.

Internationalism and Public Health.—Dr. GEORGE E. VINCENT, of the Rockefeller Foundation, opened his address by saying that, although able to differentiate between a pediatricist and a chiroprapist, his knowledge of pediatrics extended little further, but it was a subject in which they were mutually and particularly interested, and one of profound interest in connection with the war. The problem involved not only the care of very young infants but of children of school age. The experience of England and France with refugee children from Belgium and Northern France made it clear that one of the greatest dangers which confronted a nation was that menacing the health of the childhood of America.

In considering the subject of internationalism and public health, one might perhaps be justified in speculating about what was going to happen after the war. The world would probably be patched together again in some fashion just as it had been in the past after other wars. Louis Pasteur, in 1872, said that no Frenchman would ever associate with Germans again, and no German would ever dare come to France, yet, long before the year 1914, something like a reconciliation between the two countries occurred, and there was restoration of intercourse. A German diplomat at the same time expressed his regret that it would be twenty years before he could go to Paris, thirty before he could go to London and forty before he could go to Vienna. His miscalculation was evident in the face of later events, and it must be assumed that when the present war was over there would be some resumption of international relationship. The time would come when even chastened Germany would desire it. The prospect of patching the world together was a pleasant one; it would not be done, however, through politics, morals or religion, but on the basis of scientific interests which had already accomplished so much. Machine guns accomplished the first steps in conquering the Philippine Islands but science completed the work. For many years Spain had tried to civilize these people with superior force but all in vain; it remained for an American doctor with a less deadly weapon to bring about the desired result. Superstition and the inadequate customs of the ages in treating diseases was routed by the establishment of dispensaries where those diseases amenable to treatment were cured, to the great impressment of the natives. Dispensaries were followed by schools, and education succeeded oppression. A floating hospital was established covering a circuit of fifteen stations throughout the islands and on this vessel operative and other care of acute conditions accomplished results before unheard of among those people. There was also a base hospital where patients suffering from illness of long duration were taken. Such a plan of subduing an

active enemy and changing him to a friend might be found useful elsewhere; American doctors and nurses began the work, but Philippine doctors and nurses were now carrying it on. It was an interesting form of development, and another was that being done by some 600 people in the Southern States in the control of hookworm disease, an admirable instance of public health work, at first supported by the Government, who withdrew when the local health organizations were competent to carry it on unaided. The Government passed laws for the improvement of public health generally; new sanitary codes were adopted and put in force, but it remained for the people to carry them out, and make them an example for the rest of the world. Ceylon and Guatemala had adopted model sanitation codes to protect the public from hookworm, drawn up by the International Health Board of the Rockefeller Institute; these and other countries realized today as never before the part public health activities played in the progress of civilization. The men who went out from the United States to establish sanitary organizations were demonstrating what science could do as applied to human welfare; they were ambassadors of friendliness and aid to all mankind. While quiet and unobtrusive, there could be no doubt but that this work played an important part in piecing together that network of relationship between nation and nation.

In China there was an interesting experiment being carried on in medical education. It began through the desire of a group of scientists to bring about a better understanding between East and West. Two professors, one of geology and one of theology, were selected and sent to China to study conditions. There they stayed eight months, and, on their return, made the astonishing report that the only possible ground on which the two peoples could meet was where they found a common language, and that language was science; the basis of physics, chemistry, and biology. Then a group of medical men were selected as a committee to go to China; they travelled about extensively, and on their return they submitted a recommendation that there be established a scientific relation, but science applied to human welfare. This recommendation was accepted and the establishment of two medical colleges in China was planned. The first was being erected in Peking, the cornerstone having been laid in September, 1917, by Frank Billings, of Chicago. The construction of the other one, in Shanghai, had been postponed until after the war. The buildings would represent all that was modern in equipment for scientific work, but the architecture was exclusively Chinese. Though exteriorly they would merge with other structures of the ancient city, they would be equipped to meet the most exact need of modern medicine and surgery, representing all that was best in occidental science. In central China it had been deemed best to subsidize existing institutions which would provide the standard pre-medical education, forming the tributaries of the new medical colleges, and in the hospitals through-

out China internships would be provided for the medical graduates. Thus a whole system of scientific achievement existed around two medical centres. Such a system could be extended to other countries; the British Government could establish such cooperation in India with a medical college at Calcutta, or in Egypt with a centre at Cairo. Possibly such a medical centre might yet be established at Constantinople, and thus gradually increasing until a worldwide system was developed, easily invested by any imagination with vast possibilities for medical education and influence. A professor attached to an institution in Shanghai, Calcutta, Cairo or Constantinople, Chicago, San Francisco or New York, could obtain an exchange, and he and his distant confrere carry forth special knowledge, bringing back a new viewpoint. New medical knowledge could be placed at the service of the entire world. Arrangements could also be made for the exchange of medical students, and it was planned to arrange for an exchange of scholarships. There was no question but that the operation of such a system would have a direct bearing on international relationships, if only in relation to preventive medicine. That the initiative in this had been taken by the medical profession was one of the most creditable performances of modern times. That they should be anxious to put medical science at the service of the world was not surprising to those who knew and comprehended their altruism. There was no national boundary of science in its application to human welfare. The whole public health movement had come from the medical profession. Nowhere had there been a successful system of training men who wanted to devote all their time to public health work. Harvard, the University of Pennsylvania, and six or seven other institutions had offered courses in public health work in response to this new demand, and this represented solid achievement. A school, or centre for the training of public health officers in hygiene and public health had been established at Johns Hopkins, and would be opened in the fall of 1918, with William H. Welch as director. The work would be done not only in the laboratory and lecture rooms, but in the field, those entering the school getting practical experience, making actual health surveys in selected parts of the city of Baltimore. The entrance requirements would be very easy, but the standards for degrees very high. The school would be entirely distinct from the medical school in Johns Hopkins University; it would have its own building and staff, purpose and aims, its own curriculum, its own body of students, its own professional spirit. It would be the first institute established for the purpose of training men and women in public health service, and it was hoped that it would become a centre, not only for this country, but for the world. The bearing of this on international relationship was so obvious that it did not require elaboration.

Following the investigation of the tuberculosis situation in France in 1916, Hermann M. Biggs, who went there to study conditions, recommended that an attempt be made to begin a campaign of education and training in dispensaries and public health offices similar to that which had been successful in the United States. Livingston Farrand

thereupon was sent to France with a corps of assistants to undertake this problem, and that it was a problem he realized, for France had suffered so much and been obliged to accept so much, that doing good in that country had become a fine art. The people of France are fine grained and high spirited, and it was not easy to be wise and tactful with them, but Farrand was quite equal to the task and had the cooperation of the French Government and of those public spirited French deeply concerned with the problem of tuberculosis, and altogether they had organized a very interesting and effective campaign, the Red Cross working in close association. This was just a beginning, confined to the administrative side, but it represented one enterprise carried on in harmonious cooperation of two nations.

The Surgical Research Council was another agency for the promotion of internationalism; it had offices in Paris, London, and Washington, with constant intercommunication, and conducted researches that had a direct bearing on the war. This meant the recognition of certain great communities of interest in science, applicable to human welfare, and, when the war was over and the world was to be patched together again, this work by medical men in public health and in research, in the exchange between national achievements in science, this work which recognized the unity of mankind would be the force which would knit the distracted world together. It would be accomplished in no spectacular and sudden fashion, but in that quiet way which in the past had created something like international feeling.

Dr. GEORGE D. STEWART expressed the thanks of the Academy to Doctor Vincent for his views, which had both charmed and interested. The war had drawn the allied nations together very closely; it alone had given them a common interest. It had drawn also the peoples of those nations together very closely; all over America medical men were coming in closer touch with each other, every man of the draft age was getting a physical examination, and a wonderfully clear bill of health should come out of that; the doctors were getting additional medical education and training in fields broader than those known before. The war was contributing a big nationality to fit this big country, and there was no doubt that this would lead to universal peace and unity at the close of the war.

Child Welfare Work in France by the American Red Cross.—Dr. ESTHER LOVEJOY, who had recently returned from relief work in the occupied territory of France and Belgium, presented for the first time in this country some moving picture films of the refugees who had been sent back to Evian by the Germans; there were old people, and children from two to fourteen years, and those women who had more than one child. Women with only one child were kept from returning because they could work, and most of the children under two years of age had German fathers and were kept in Germany. From three hundred to three hundred and fifty thousand had been thus sent back since the beginning of the war. They came by way of a three day journey through Belgium and Switzerland, and presented a most pathetic picture, with the exception of some of the older boys, who could be heard,

after they had been assured they were safe from the Boches, singing little songs they had composed indicating what they would like to do to their enemies. The younger children, however, when they were not terrified and apprehensive, were apathetic, and all were terribly undernourished. Many of them had not been washed for months, and skin diseases were rife among them. Doctor Lovejoy exhibited some of the little gas masks that these children had been obliged to wear constantly; they were most uncomfortable looking arrangements.

The speaker had found that the French were interested in anything and everything American; their confidence in the help Americans would bring them was unlimited and their faith boundless. The American Red Cross was doing everything possible to assist the French relief societies, and was particularly busy at Evian. This was a town of about 5,000 inhabitants, and as the convoys brought in about 3,000 repatriates a day, the task of redistributing them elsewhere as rapidly as possible to avoid congestion was no small one. An isolation hospital was maintained here by the Red Cross to prevent the introduction of contagious diseases into France, and a large plant for bathing and disinfection was established where 200 persons at a time could be cared for. Every kindness and tenderness was shown these repatriates, and it was hoped that life would be easier for them after their almost unendurable suffering.

Stated Meeting Held April 4, 1918.

Dr. WALTER B. JAMES, President, in the Chair.

Neuropsychiatry and the Mobilization.—Lieutenant Colonel PEARCE BAILEY, Medical Corps, N. A., delivered an address on this subject, an abstract of which was published in the issue of the *NEW YORK MEDICAL JOURNAL* for April 27, 1918.

Dr. CHARLES L. DANA expressed his appreciation of the interesting and stimulating address which Colonel Bailey had made and very much wished it could be given before other audiences in other places since such a vivid presentation of the work of the medical department would be most useful in arousing effective and patriotic interest.

Doctor Bailey had covered his subject completely, and the speaker wished simply to emphasize one phase of the problem which had been presented. The Surgeon General's Office, and particularly the division over which Colonel Bailey presided, was very much in need of experienced medical men, and the question was how to get more from civil life without crippling the home activities. This might be accomplished in various ways. In New York city most of the doctors, aside from their regular practice, were working in colleges, hospitals, dispensaries, in the health department and in laboratories. There were five colleges in the city and five sets of professors teaching the same branch of medicine. Was it not possible for them to combine so that two men could do the work?

In regard to hospital workers, there were 184 hospitals in Greater New York; if they combined, one man could do special work in several and release the others; or the staffs could be enlarged by calling in the consultants to active service again.

There were over seventy dispensaries in the city. The plan had already been suggested and successfully carried out in Boston of calling in some of the older men who were partly retired practitioners to help do the work of the dispensaries. Besides, the nurses or special aids to nurses could help in history taking or social work, and, in regard to health work, a good deal of this could be done by trained men and women who were not physicians. The same was true of work in the laboratories; women could be taught to become technicians and thus do work which would set free some trained medical men. After all, the great obstacle which prevented many desirable men from joining the army was an economic one. A man with no financial resources, with a wife and children, felt that he could not enter a service in which he might be kept for years. This difficulty might be relieved in part by asking men who are staying at home to make regular contributions to the families of physicians at the front. There were many men who would be glad to contribute moderate sums monthly. The possibilities of utilizing men on long contracts and with definite rank should also be considered.

The plan suggested by Colonel Bailey for increasing the powers and functions of the Federal Health Service had for a long time received the approval and support of the Academy of Medicine, and it was hoped that this would be one of the outcomes of the war.

Dr. L. PIERCE CLARK would make one remark only and that in regard to statistics showing the numbers of feeble-minded and epileptic who had been found in the camps. There had been a general impression that life in the army had brought about a high number of epileptics, but in these statistics one saw feeble-mindedness three times as great; certainly the latter was not induced by going in a cantonment, and it was equally as certain that epilepsy was not induced by enlistment and by camp life. This did not mean that epilepsy, already latent in an individual, was not precipitated and brought out by the discipline and training, but it was not essentially created by such.

It was obvious that feeble-mindedness and epilepsy were the main issues in ruling out a number of enlisted men, and that organic nervous diseases did not play nearly so large a part. Medical men, therefore, in undertaking this work should be equipped to detect the symptoms of those two great disorders which they would meet so frequently in their work. It was interesting to hear that the psychologists were cooperating with the psychiatrists in eliminating mental deficiency from the army. Some plan for doing this had long been a crying need in civil life and indicated a great advance. It would be interesting to know how it worked out and how much they failed to exclude by these systems of examination.

It seemed obvious that the thing to do in the cases of epilepsy where the condition had been precipitated by the type of training the men went through in the army, was to take the patients out and give them the proper treatment to restore them to the condition they were in previous to enlistment; that is, non-convulsive and with only the potentiality for their disease. It was unfortunate that they could not be

more carefully examined by the boards of enlistment at the beginning. The speaker had seen cases that had been trained for six months and then discharged on account of seizures while in camp, and it would seem that these should have been screened out in the first place. Even those distinctly declared by reliable medical authorities to be epileptic were repeatedly called before their local boards. This should be obviated; they should not be recalled when once their condition was known, even if only as a form of labor saving. In many instances where there were convulsions at unusually long intervals, these individuals were able to get by local boards because of their extreme patriotism and earnest desire to enlist, quite an opposite manifestation to that of the psychoneurotic who was more likely to be disinclined toward army service. Those who are epileptic but extremely patriotic and who have enlisted should be given all honor and every effort made to restore them to their previous state of health.

Dr. CHARLES W. PILGRIM, chairman State Hospital Commission, merely wished to add a word or two in regard to the war in connection with the psychoses in civilians in the State hospitals for the insane. The statistics in New York State for forty-four months before the war showed 29,326 admissions; while, in the forty-four months which had elapsed since the declaration of war there had been 33,311. This was a marked increase, and, as the majority of the new cases were of the dementia precox and manic depressive variety, it was only fair to assume that the stress and excitement of war times was the cause. Another interesting fact was that the admissions showed a marked increase in recurrent cases. It was also noticed that many cases occurred among old people who had delusions of a depressing character, such as the approaching end of the world, that everything was going wrong, etc., such as would be caused by the present troublous times. Another reason for the increased admissions might be that many people have gone into new employment where the work has been more strenuous or where they have made a great deal more money and have lived very different lives.

In England the hospitals for the insane had played an important part in connection with the war. In January, 1915, in England and Wales 15,000 beds were turned over to the war department by the hospitals for the insane, the excess patients being distributed among the remaining hospitals. This could not be done in this State because the hospitals here were already overcrowded, but it might be of interest to know that the service flag of the State hospitals for the insane bore 331 stars, that half a million dollars had been subscribed to Liberty Bonds by employees of these hospitals, and that their patients and nurses had made and contributed to the Red Cross 75,000 useful articles for the soldiers. Twenty acres of land on Ward's Island would soon be set aside for a hospital of one thousand beds for the use of the navy, and the State hospitals were preparing to care for all cases of insanity occurring in the service where the patients had a claim upon the State. It could therefore be said that those connected with the State hospitals for the insane were trying to do their part to make the world safe for themselves and their children.

Letters to the Editors.

MALINJERER OR MALINGERER.

145 WEST SEVENTY-SEVENTH, STREET.

New York, May 4, 1918.

To the Editors:

The question of the pronunciation of the word "malinger" is an old story. Since our entrance into the present war, this practice has become more or less prevalent. Hence, the attention of the medical profession has of late been directed to this subject by many public addresses and discussions before the New York Academy of Medicine and elsewhere by well known physicians in the service, as well as by those in civilian practice. This is, therefore, an opportune time to state that the terms "malingerer" and "malingering," so frequently used, have been incorrectly enunciated as "malin-ger-er" or "malin-ger-ing."

In every known dictionary of the English language published within the last thirty years the pronunciation given is "malin-ger-er" and "malin-ger-ing," the "g" being hard as in "gun" and not soft as in "gem."

The only exceptions occur in Stedman's *Medical Dictionary* and Dorland's *American Illustrated Medical Dictionary*. In both of these books, the mispronunciation is given. It has been admitted to me, however, by one of these lexicographers, that this was an error which will be corrected in the next edition.

Very truly yours,
WILLIAM M. LESZYNSKY, M. D.

Book Reviews.

[It is the policy of this journal to review books of medical interest, but we cannot undertake to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

Locomotor Ataxia (Tabes Dorsalis). An Introduction to the Study and Treatment of Nervous Diseases, for Students and Practitioners. By WILLIAM J. M. A. MALONEY, M. D., Fellow of the Royal Society, Edinburgh; Fellow of the New York Academy of Medicine; Fellow of the New York Neurological Society, etc. Illustrated. New York: D. Appleton & Co., 1918.

The refreshing thing about this book is that the author approaches the problem presented by a tabetic individual from the physiological side as well as the pathological and clinical. He holds that in tabes we have a perfect example of the result of disturbance of reflex integration. He approaches the ataxia, which is, after all, the chief disabling symptom, from an entirely psychological standpoint. He holds that it is a symbol of imperfect thinking, and proceeds to correct the faulty process. It must not be thought, however, that he neglects the luetic pathology of the disease. On the contrary, he devotes much space to the syphilitic lesions and their antisyphilitic treatment. It is when we come to his chapters on the mental state of tabes and its treatment that we find a highly original, illuminating discussion. Maloney gives a masterly analysis of the complex fear states seen in these patients, with minute directions for their alleviation. His discussion of pain shows deep insight. If his methods of dealing with this symptom were put into general practice we should never see the distressing sequence of visceral crisis, morphia

His plan for dealing with the ataxia of tabes gets away from the old idea of wing vision to replace the lost kinesthetic sense, and substitutes instead thinking of an act and then performing it. A blind tabetic, we hear, suggested this idea originally. Whether or not he actually does get his results in the manner he thinks he does is open to question. But the idea is a good one, and probably what happens when the tabetic is trained is that he develops a sensation of "innervation," a term popular thirty years ago, discarded,

and lately revived, and by the help of these three sensations learns to measure movement not, as Maloney says, by the "systematic ordering of the mental processes," but by attempting to perform the movement over and over until the reflex arc is formed. However he gets his results, he certainly does, and his book is a valuable one. From its reading, the general practitioner as well as the neurologist, will greatly benefit.

A Textbook of First Aid and Emergency Treatment. By A. C. BURNHAM, M. D., Medical Corps, U. S. R., Instructor in Surgery in the Polyclinic Hospital, New York City; Attending Surgeon, Department of Surgery, Vanderbilt Clinic, College of Physicians and Surgeons, New York City. Illustrated with 160 engravings and 2 plates. Philadelphia and New York: Lea & Febiger, 1917. Pp. 307. (Price \$2.)

This small, handy volume is particularly suitable for the untrained first aid worker and the advanced student who may be expected to practise first aid under the conditions of modern warfare. Combined with the principles of treatment, it is an outline of anatomy and physiology written in lecture form, comprehensible to the first aid student. The author discusses general principles, anatomy and physiology of the various systems of the body, treatment of wounds, hemorrhage, infection, fractures, and dislocation; and in a splendid section, profusely illustrated, describes the uses of the various kinds of bandages. Miscellaneous first aid treatments for such conditions as suffocation, poisoning, and directions for transportation and nursing are very adequately discussed. The section on common emergencies is well written, to the point, and practical. Altogether it is not only a valuable book of reference for the advanced student, but is a splendid textbook which should fill the needs of the present popular demands for such a work.

Surgical Contributions from 1881-1916. By RUTHERFORD MORISON, M. B., F. R. C. S., Edinburgh; F. R. C. S., England, Consulting Surgeon to the Royal Victoria Infirmary, Newcastle-on-Tyne; Professor of Surgery, Durham University; Examiner in Surgery, Liverpool University. In Two Volumes. Volume i, General Surgery; volume ii, Abdominal Surgery. New York: William Wood & Co., 1916. Pp. xii-427, xii-953. (Price \$10 a set.)

The contributions consist of two volumes of the collected papers of this eminent surgeon, practically his entire surgical records from 1881 until 1916. Volume i deals with general surgical subjects, volume ii exclusively with abdominal surgery. The volumes are profusely illustrated, and the text elucidated by many diagrams and half tones. The volume on abdominal surgery is a most valuable collection of papers; moreover, the writer's style is very personal intensely interesting, and in a most open and instructive way he discusses many of his surgical errors. The work is written in a chronological manner, and, therefore, while there is very little system in it, it is interesting to compare the methods of operation in the early 80's with those of the present day. The papers relating to stomach and liver surgery are particularly instructive, and it is a great asset to have them in their original state and collected under one cover.

Electrotherapy in Gynecology. By SAMUEL SLOAN, M. D., F. R. F. P. S. G., Consulting Physician to the Glasgow Royal Maternity and Women's Hospital, and to the Glasgow Hospital for Diseases of Women; Examiner in Midwifery and Gynecology to the University of Glasgow, etc. New York: Paul B. Hoeber, 1918. Pp. xxii-208. (Price, \$4.)

This valuable record of twenty years' work in electrotherapy comes from one who is a recognized authority in gynecology as well as electricity. The book does not deal wholly with the ray, the galvanocautery, or radium, but gives an accurate description of the modern theory of electrons, and ions, their physiological action in electrolysis and electric ionization. There is an illustrated description of the armamentarium required for the application of static, galvanic, faradic, and high frequency electricity in gynecology with definite instructions for their use. An important section of the book discusses the gynecological disorders in which electricity has been found by the author to be not only desirable and effective but preferable as the sole therapeutic application. In fact a hundred pages of

case reports omits those in which electricity was used in conjunction with other operative or nonoperative measures.

The author does not use the heavy galvanic currents originated by Apostoli for the cure of uterine fibroids but a milder current for its curative effect upon the congested and bleeding endometrium without attempting a reduction in the size of the tumor. He has not seen very encouraging results in nocturnal enuresis. The reports of four or five hundred cases give an idea of the "complaints" treated. They include: Pruritis—vulvar and anal; pelvic distress—dragging sensation due to prolapse; neuritis and other abnormal sensations, external and internal; dysmenorrhea—various forms; subinvolution without hemorrhage; hemorrhage, apart from fibroids—menorrhagia and metrorrhagia; septic vulvitis, vaginitis, endometritis, or metritis; pelvic inflammation—cellulitis, peritonitis, salpingitis, ovaritis; fibroids; sterility, when a cause of mental distress to the patient; irritability of bladder—functional; incontinence of urine; nocturnal incontinence of urine; cystitis; hemorrhoids; constipation, when otherwise incurable.

A very interesting chapter describes the successful treatment of constipation, even such obstinate cases that the rectal masses had to be removed by manual pressure applied through the vagina. The static induced current is used with an electrode in the rectum and a large one over the abdomen. Twelve treatments, given every other day, commonly effect a cure. Of course we assume that the author's cases were dependent upon muscular atony rather than upon numerous dense deforming and obstructing adhesions.

"Hemorrhoids can be practically cured by high frequency local applications with almost absolute certainty." He uses a metal rectal electrode of somewhat the shape of a dumbbell, so as to make contact with the whole surface of the anus, the anal canal and the lower rectum. The application is a monopolar one of 150 to 200 m. a. for fifteen minutes. Several treatments are necessary. "Fissure of the anus can generally be cured by zinc ionization."

The book will be a most useful and practical guide to this field in nonoperative gynecology.

Births, Marriages, and Deaths.

Married.

ARNOLD-MOUILLEFARINE.—In April, Dr. John Arnold, of Baltimore, Md., to Renée Mouillefarine, of Paris, France.

Died.

ASPER.—At sea, in April, Dr. Burt Jacob Asper, M. R. C., U. S. Navy, of Chambersburg, Pa., aged twenty-nine years.

BROOKS.—In New York, N. Y., on Friday, April 26th, Dr. George Frederick Brooks, aged sixty years.

ECKARD.—In Peoria, Ill., on Sunday, April 21st, Dr. Elmer M. Eckard, aged forty-five years.

FLEMING.—In Brooklyn, N. Y., on Thursday, May 9th, Dr. Martin J. Fleming.

GREEN.—In Walker, Minn., on Tuesday, April 23d, Dr. Edgar Fossin Green, of State Sanatorium, Minn., aged forty-three years.

GROW.—In Lynn, Mass., on Tuesday, April 23d, Dr. Timothy Rose Grow, aged seventy-eight years.

HOAG.—In Manhasset, N. Y., on Monday, May 13th, Dr. William H. Hoag, aged seventy-eight years.

HUNTER.—In Erie, Pa., on Saturday, April 20th, Dr. Wallace R. Hunter, aged fifty-two years.

JACKSON.—In New York, N. Y., on Sunday, May 12th, Dr. Alfred William Lyndon Jackson.

JOHNSTON.—In New York, N. Y., on Saturday, May 11th, Major James Chew Johnston, M. R. C., U. S. Army, aged forty-six years.

MORRISON.—In Newton, N. J., on Friday, May 10th, Dr. Ephraim Morrison, aged sixty-six years.

SKINNER.—In New York, N. Y., on Saturday, May 11th, Dr. Frederick C. Skinner, of Davenport, Ia., aged thirty-nine years.

WILLIAMS.—In Brooklyn, N. Y., on Saturday, May 11th, Dr. George Albert Williams, aged sixty-three years.

WILSON.—In Baltimore, Md., on Wednesday, May 8th, Dr. Henry Merryman Wilson, aged eighty-nine years.

YATES.—In New York, N. Y., on Thursday, May 9th, Dr. David Gilbert Yates, aged forty-eight years.

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Original Communications

HYPERACIDITY OF THE GASTRIC SECRETION THE PRIME FACTOR IN ATTACKS OF ANGINA PECTORIS.

A Clinical Study.

By H. ILLOWAY, M. D.,
NEW YORK.

Late Visiting Physician, Jewish Hospital, Cincinnati, Ohio; Late Professor of Diseases of Children, Cincinnati College of Medicine and Surgery; Fellow of the New York Academy of Medicine, etc., New York.

That there may be no misunderstanding as to the form of cardiac disturbance referred to here, I beg to premise that what I understand by angina pectoris, in its fully developed form, is characterized by the following symptom complex.

1. The patient is seized with a pain at the upper third of the sternum, extending, at times, a little way over on to the corresponding region of the left thorax. The pain may be of a stabbing character (as if a knife had been pushed into him, as one patient described it) or it may be a severe pressure; the patient feels as if he were in a vise and powerfully compressed from front to back. 2. Though the pain may occasionally remain confined to the chest region described, it radiates, most frequently, into the left arm and down as far as the tips of the fingers. Sometimes the radiation may take place into the right arm and in rare instances into both arms. 3. This pain is, in my experience, brought on by motion only, and mainly by motion in the open air. When the patient is quiet in his home or even walking about in his rooms, he will remain free from pain, but let him walk a short distance even half to one block in the street and he will have a seizure. He will be compelled to stop for from five to fifteen minutes; then the pain has passed and he will be able to walk a much longer distance before he has another attack. In its severest form even a slight motion of the body, as a turn from one side to the other in bed or the getting up from a chair, however lightly and carefully executed, may bring on the spasm (1).

As there are variations from the typical case in all diseases, so also with this one there are variations in the symptom of pain. In some cases, the chest is pointed to as the seat of the terrible pain and but little complaint is made of the arm. In some rarer instances it is the pain in the arm that is so violent in its cramping and burning that the pain in the chest is almost lost sight of.

The lungs, heart, and stomach being connected by one cable, if we may so term the vagus nerve (besides the various filaments of the sympathetic system), it is not at all strange that patients should present symptoms which point to the stomach and frequently lead them to believe that their ailment is altogether gastric. Even many years ago my attention was directed to the rather close relationship between the heart and the stomach (2), and when these cases presented themselves, it was a further opportunity to continue the study.

One particular feature that all these cases have in common, and which in a subsequent study attracted my attention, is the hyperacidity of the gastric secretion as shown by an examination of the chemismus of the stomach. It must also be borne in mind that in all these cases the chemismus was examined after an Ewald and Boas test breakfast, with a bland meal (all acid fruits and drinks and spicy food preparations excluded) taken the evening before and usually a glass of milk before retiring. The conclusion is fully justified that but for this prohibition of all stimulant food or drink, as described, a much higher degree of acidity would have been connoted.

Case I. January 2, 1903. S. K. Traveling salesman. Age 42. Married. No children. 5 feet 7 inches in height, 170 lbs. For two or three years has smoked only two cigarettes a day, formerly more. Drinks a glass of beer with his lunch. He works very hard.

Up to about eighteen months ago he was in excellent health, then one day whilst sitting in his office he was seized with a peculiar pain in the chest, about the middle of the sternum. He felt as if his heart were moving up and down, and as if he were being torn asunder in his chest and face. His eyes pained him greatly. It lasted for about two minutes, then he heard a snap inside and the attack was over. Five months later he had another attack, more severe than the first and of longer duration; it lasted one hour. In January, 1902, he was one day suddenly seized with a pain in his left shoulder; it traveled down his left arm, and his fingers were drawn together like a claw. He took some medicine, and in two days was relieved. The attacks have been recurring with increased frequency—five since last October—and have been growing in severity, lasting seven to eight hours now. Since the second or third attack (he is not certain which) he has a feeling of great pressure at the upper part of the sternum, impeding breathing.

He says he is nervous. Was so as a youth. If he heard something that startled him, his bowels would run off. Now, instead of the diarrhea, he gets a choking feeling. He thought at the time of the attack that it was due to an excess of gas, and tried to relieve himself by belching; he succeeded in eructating two or three times, but the relief was only momentary. Formerly he could run up and down

four or five flights of stairs. Now, even a slightly hurried walk on the even ground will bring on a pressure in the chest. He has been under treatment with an eminent practitioner, who prescribed a mixture of pepsin and dilute HCl, to be taken with meals, and a mixture of nitroglycerin and morphia to be taken when he has the attacks, but he has not benefited in the least. He is a hearty eater. Three good meals a day. Belches very little. Bowels regular. Sleeps fairly good, but he does not go to sleep easily; it seems to him that he breathes with some difficulty when he lies down.

Examination. General appearance good. Heart negative. Tongue light white coat. From xiphoid cartilage to umbilicus, sixteen cm. Gastrothoracic region resonant from upper border of sixth down to the tenth rib. Left epigastrium resonant to crease. Median line resonant from xiphoid cartilage down ten cm.; from there to umbilicus, dull. Right epigastrium same as left. No splashing. Water, eight ounces. No splashing; further five ounces of water; no splashing (even with mouth open and knees drawn up). No succussion. Liver and spleen *in situ normale*. Abdomen negative. January 6th. Test breakfast (E. & B.), one hour; tube; 120 cc. stomach contents—bread and fluid. Very little bread; fluid white, opaque. (Considerable salivary froth came with it and formed the top layer in the glass.) React., blue litmus + React. Congo. + React. : Phloroglucin van. + Free HCl, 27. Total acidity, 49.

Diagnosis. As to ailment: *Angina pectoris* (pseudo). As to stomach: *Secretion hyperacid*, with a tendency to further exaggeration of the acidity on stimulus. Motor function normal.

Treatment. Dietary directions in consonance with the state of the stomach. Cold sponging. To walk a measured and somewhat slow gait. To avoid all overexertion. To stop smoking altogether. Application of the Faradic current (S. & R.) over the upper half of the thorax and the precordium and shock according to the method of Duchenne (of Boulogne). For the nervousness, the static current (patient upon the insulated platform and chain connection of this to the battery). January 7th and 9th. Faradization. Static. January 12th. He thought he felt some quivering yesterday, the same as before, but had no pain. He was out in the evening, and whilst walking in the street that feeling of pressure in the upper part of his chest came on him. As soon as he got home he was all right. Faradization. Static. Sparks to chest. January 22d. He came in from the country yesterday. The whole day he had a taste of brine (like mackerel brine) in his mouth. About 11 p. m. he woke up and had a spell; a shaking movement (up and down) in his chest, as described; also felt a drawing in his face. Altogether the attack was less severe, and lasted only half an hour. He made a movement in his throat as if he wanted to hawk up something; at once something seemed to have become dislodged in his throat, or to have changed its position (gas?) and the attack was over. Faradization. Slow, with coarse coil, followed by rapid, with fine coil. He has had no pains in the head except for the short period of the attack last night. Ordered. Tincture nux vomica, ten drops in one ounce of Vichy, twice a day, after lunch and dinner. January 25th. He is doing nicely; walked up four flights of stairs, and found it easier than before. Still gets a little pressure in his chest when it is very cold and out in the open. He locates it just beneath the pommum Adami. Potassii iodide, five grains twice a day. January 29th. Continues to improve. The medicine on the first day loosened his bowels and gave him cramps in his stomach and bowels. The next day, some cramp, but much less than yesterday. No loose bowels. After eating, the pain at once disappeared. He has slept better the past two nights. January 30th. He telephoned that the medicine did not agree with him; advised a chocolate coated tablet, which agrees better with him, but he takes only one a day. He feels good all day, but toward evening a little pressure about the second and third right rib. A few days later, whilst here for treatment, he said that in the evening when he was out in the street he would get a feeling of pressure in his shoulders; he felt as if his overcoat were too heavy for him. February 25th. Feeling very good; he found he could walk quite briskly during a cold snap without feeling the least discomfort. Warned him to go slow; to take things easy for the next five or six months

yet. March 5th. Doing very well. Faradization. Has some rheumatic pain in right shoulder. Yesterday his stool was very offensive, so also the flatus discharged. Ten to fifteen grains of salol (given thrice daily). March 8th. The rheumatic pain relieved. Continue salol today. Faradization. Static. March 11th. Treatment as before. Going to leave in a few days on a long business trip. October 31st. Came in today and reported as follows: In May he had a severe attack that lasted about two hours; is certain that it was brought on by something eaten, and which disagreed with him. About the end of June he had a slight attack lasting about ten minutes. It was brought on by jumping from a car with a high step. End of July, another attack. Came on suddenly whilst he was engaged with a customer. It lasted one and a half hours. August 15th or 20th he jumped from a car in Milwaukee, and felt a little pressure in his chest. In the attacks above recounted there was no bulging of the eyes, and no congestion of the veins of the face and neck, as there had been in the attacks previous to his beginning treatment with me. For the last week he has felt bloated, like a man who has overeaten—cannot walk without losing his breath. Faradization. Nux vomica and Fowler's solution. November 4th. Feeling better. No pressure in stomach. No bloating. Bowels regular. Faradization of chest and stomach. November 29th. He felt a recurrence of the tremor in his chest, which lasted about ten minutes. He felt the muscles of face and neck stiffening, made a swallowing and retching movement, and was relieved. He had a sort of premonition, a feeling as if there was to be a recurrence of his spells, for the last three or four days. His appetite is good; three meals a day. Bowels regular. Says that when he lies down in the barber chair he gets dizzy, likewise if he makes a rapid turn with his head. Static. Spark, to chest. Presuming the dizziness to be dependent upon a defective digestion (possibly a slight deficiency in the HCl element of the gastric juice), I prescribed a bitter tonic with a little dilute phosphoric acid. He volunteered the statement that he felt vastly better than he did a year ago; at that time his head felt as if it was full of stones.

I saw him again in June, 1906, when he brought his wife for treatment for a chronic constipation. He was feeling very well, and though very much on the road had had no recurrence of his old trouble.

Case II. July 16, 1907. M. L. R. Traveling salesman. Age 34. Single. 182 lbs. 5 feet 7½ inches. Smokes about twenty cigarettes a day. No alcohol. He has had occasional attacks of indigestion for the last two or three years, but for the last four weeks has had attacks of pain in his chest which go into his left arm. He came out of the subway one day, and in going up the steps was suddenly seized with a pain about his heart (præcordium). At first the attacks were located there, rather more over the gastrothoracic region, and then moved over to about midsternum. The pain shoots into his left arm as far as his elbow. He will have an attack if he walks soon after a meal; he took a walk after his dinner last evening, and had a very severe one. The same thing happened this morning after breakfast. Once he had an attack in the night. His appetite is very good. Breakfast: Oatmeal or eggs in various styles, coffee, rolls, and butter. Lunch: Mainly vegetarian. Dinner: Soup, meat, vegetables, dessert. He has cut out vinegar, as he thought it hurt him. Belches considerably. He is constipated. For the last three weeks he takes on rising a glass of hot water with sodium phosphate. No headaches. Sleeps well.

Examination. Tongue, light white coat. Teeth good. Gastrothoracic region resonant. Epigastrium: Nothing abnormal to inspection or palpation. Dull on percussion. No sensitiveness anywhere. No splashing. Water, eight ounces. No sound. Liver, spleen in normal position. Abdomen: Good panniculus; abdominal walls somewhat loose, as if he had lost some fat, though he says not; no sensitiveness anywhere. Heart normal in size and sounds. Pulse sixty-six at left wrist.

July 17th. Test breakfast (E. & B.), 1 hour; tube; 40 cc. Stomach contents: bread and fluid, bread well worked up. All of the usual appearance. React. blue litmus + React. Congo + React. : Phloroglucin van + free HCl, 26. Total acidity, 71.

July 18th. *Diagnosis.* Angina Pectoris. Hyperacidity. Constipation.

Treatment. Absolute prohibition of smoking. Dietary directions in consonance with the gastric and intestinal state. Vichy, Celestins, three times a day. Water (plain) before or after meals. Toilet rule.

Case III. January 29th, 1908. H. A. Forty-nine. Married. No children. Height, 5 feet 5 inches. Weight now 157 lbs. Usual, 163-4 lbs. Is an inveterate smoker; has smoked all his life, thirty to forty cigarettes a day. Now, three or four cigars. No alcohol. He has been troubled with muscular rheumatism for many years—never had the inflammatory variety. Has had uric acid gravel for many years. Two years ago, when living in San Francisco, he found that after climbing a hill he had to sit down and catch his breath. After the earthquake he came back East, and one day found that when he walked some distance he felt a marked oppression in his chest, but no pain. Three months ago he had a midnight attack of angina pectoris, and he had six attacks during that night, the pain running down his left arm. Has had no recurrence of the night attacks, but cannot walk half a block, even slowly, without getting a severe, stabbing pain through the middle of the thorax. He must sit down, and is quickly relieved. Gets heartburn and sourness frequently. Appetite good. Two meals a day. Breakfast: Fruit, two boiled eggs, Graham roll, hot milk and coffee. Dinner: Chicken soup, white meat or boiled ham, vegetables, string beans, spinach, asparagus, salad, ice cream, black coffee. Drinks no more than two or three glasses of water a day. Bowels: Takes a lapactic pill or Apenta water every other day. Headaches formerly, but not lately. Sleep: He retires about midnight, and since the midnight attack, noted above, his sleep is much disturbed. Has had attacks of urticaria, which small boned fish may bring on. Herpes and itching, which have lasted for nearly five years.

He is the son of a physician who was eminent in his locality; is a pharmacist himself and is therefore well acquainted with drugs. He has taken iodide of potassium and strophanthus; now takes aspirin (more for his rheumatism).

Examination. Epigastrium: Nothing abnormal to inspection or palpation. No sensitiveness anywhere. No splashing. Water, eight ounces. No splash; no sound. Liver and spleen in situ normale. Abdomen: Nothing abnormal. Heart: Size normal. Sounds normal. Pulse 72, of good force. No evidence of atheroma or of arteriosclerosis.

January 30th. Test breakfast, 1 hour; tube, 50 c. c. Stomach contents, bread and fluid, bread well worked up. React, blue litmus +. React, Congo +. React, Phenolphthalein - van +. Free HCl 2. Total acidity, 82. Pepsin +. Rennet +. Urine shows slight trace of sugar. React, Nylander +. Sp. Gr. 1.028. Acknowledged that he takes sweets, such as candy and ice cream, quite freely.

Diagnosis. Angina pectoris. Faulty metabolism (uric acid gravel). Muscular rheumatism. As to stomach: Hyperacidity; increase of rennet, none of pepsin. *Treatment.* Absolute prohibition of tobacco. Diet. Eat mainly milk and eggs. Allowed fish, and, twice a week, a little chicken; water, vegetables. Eat three meals a day. Go to bed early and get up early. Medication: An alkaline powder with extract of belladonna. To come in for treatment by electricity as detailed in Case I. February 10th. He is doing well. Can walk much better, the pain on first starting out is very much less, and when he sits down is quickly relieved. He can then walk quite a stretch before he feels anything more. February 13th. Faradization of heart (S. and R. and shocks). He has had three such treatments since the first. March 17th. Returned from Atlantic City, where he had gone because of rheumatic pains. Was very well down there; had no spell even when constipated. Since his return, some rheumatic pains again. July 1st. Reported again; is feeling very much better. Sugar has disappeared from urine. No unprovoked attack in five months, but when he walks a block he gets a pressure in his left side and præcordium. Has been examined for life insurance, and passed. July 14th. Saw him today; is looking very well; feeling generally fine. No hyperacidity; no sourness or burning; can move about much

better. Still smokes, though not as much as before; says he cannot stop altogether. He is going to Baltimore, where he has many friends among physicians, to get high frequency treatment. I did not have the necessary apparatus at the time. September 21st. He reported today. Had been in Baltimore for two months, and had received high frequency treatment, also vibration massage.

Is in fine condition. He says when he starts out in the morning he must stop once or twice and then can walk all day. He carries a heavy sample electric battery round with him, for which he is canvassing the physicians. Smokes as before.

Case IV. November 12, 1912. L. P. Merchant. Age, forty-five. Married. Children. Five feet seven inches. Weight, 183½ lbs. Smokes eight or more cigars, and three or four cigarettes a day. Drinks occasionally a little wine. No whiskey. Began to ail about six weeks ago; vomited everything he ate and had cramps in his belly. The vomiting lasted eight days, and then stopped, but the cramps continued. The last few days the cramps are not as severe. For two weeks he has had pain in the epigastrium, which spreads from there into his left chest. With this, a severe cramp in his left arm, from shoulder to fingers, which lasts about eight minutes. Has about two attacks a day, one in the morning and another later in the afternoon. His appetite is good, but lately he eats only milk and eggs. Bowels always regular. Tongue coated, heavy white coat.

Examination. Heart normal in size; sounds normal even after some forcible exercise, i. e., running several times up and down the length of the room. Epigastrium: Nothing abnormal to inspection or palpation; no sensitiveness anywhere; no splashing; water, eight ounces. No splashing; no sound. Liver and spleen in situ normale. Abdomen, nothing abnormal. November 13th. Test breakfast (E. & B.), 1 hour; tube; 25 c. c. Stomach contents: bread and fluid, all well mixed together, emulsified. React, Congo +. Free HCl 52. Total acidity, 65. Filtered very slowly because of the large amount of gastric mucus in it. Had to change filters after a while. *Diagnosis:* Angina pectoris. As to stomach, hyperacidity, gastralgia, intestinal colic.

Treatment. Absolute prohibition of tobacco, alcohol, and butter. Medication: Alkaline powder with extract of belladonna reinforced with the extract of hyoscyamus. November 15th. The pain as before; if anything, more severe. This morning at 7 a. m. turning about in bed brought on a severe attack. If he walks a block he gets the pain and must stop for some minutes till it passes.

Directions to continue the diet, leave off the powders, and take sodii iodide gr. vi t. i. d. Pillul. belladonnæ (Trousseau), for two days, one pill morning; then two pills each morning for two days, then three pills each morning; also

Sodii bicarb.	.....gr. xl;
Sp. ammon. arom.	.....ss.
Hoffmann's anodyne,	.....ʒi.
Aq. dist.	.....q. s. ad ʒiii.

One tablespoonful in two of water when pain comes on November 20th. The attacks come on five or six times a day, but more lightly than before. (He walks about much in his business.) Altogether, the attacks have been much less severe than before. As he was tired of eggs, allowed him plain boiled fish and rice once a day. Instead of the aromatic spirits of ammonia I ordered tablets of nitroglycerin. He took one tablet before the attack, and more than three tablets a day. If the attacks should be unusually severe, he can take two tablets at one time. Faradization. December 6th. Reported today. Much better; he still gets attacks, but less frequently and milder. His tongue has a rather yellowish coat. Reexamined heart; normal in size; sounds normal but somewhat low in tone. Pulse fairly full, soft, easily compressible (seventy-six per minute). Static (on insulated platform and stool attached to battery) for fifteen minutes. Continue the diet. Increase the sodium iodide to twelve grains three times a day. Continue nitroglycerin tablets pro re nata. Because of the coated tongue I ordered a pancreoprepina tablet. December 17th. Doing very well; can walk very well now, only, if he should strike out at a rapid gait he would get an inkling of

his pain. A specimen of his urine which he brought in by direction showed much uric acid. To drink Helenes Quelle.

On March 30, 1913, I was called to see him. He had eaten some extraordinarily heavy meals lately and on the 26th was seized with vomiting and has been vomiting ever since. At first he vomited only what he ingested, lemonade, soup, etc.; now vomits bile; very much nauseated. Examination negative. Ordered one teaspoonful of Potio Riveri every fifteen minutes for eight doses, then every half hour. Sinapism back and front every four or five hours; no food or drink till further orders. At 11 p. m. his daughter telephoned he had not vomited since 8 p. m.; was feeling easier. Continue the prescription as directed. To quench the thirst, one teaspoonful of milk and lime water, equal parts, hot, every half hour beginning about 3 a. m.

April 1st. He is better; has not vomited in the last twenty-four hours. Very little nausea. Can increase the quantity of milk and limewater to half cup every two hours. If this agrees, then later on give a cup of milk with half an ounce of limewater every two hours. Three to four one minim tablets of tincture of nux vomica, in Vichy, three to four times a day. April 5th. The daughter telephoned that her father had very severe abdominal cramps. Directed powders of camphor and codeine, half a grain of each. April 10th. He came in this evening and reported that he still has very severe cramps. They came on two or three hours after meals. The camphor and codeine powders give no relief. Presuming that the cramps were due to a hyperacid condition of his gastric secretion (as it had been a few months before), I prescribed the alkaline powder with extract of belladonna. April 14th. Reported by telephone. The cramps relieved and he is all right. October 15th. For a week he has had colic, due to overeating. Directed him to live on a rather bland diet, milk, corn-flakes, soft boiled eggs, for three or four days, then to return gradually to normal diet—according to the diet list I had given him. October 20th. He is feeling well again and following the dietary directions given him.

I heard from him in the spring of 1916 when he called me up relative to another patient. He informed me that he had not had any recurrence of the attacks for which he first consulted me.

CASE V.—May 5, 1914. Ch. S.; sexton; age sixty-four; married; one child; five feet seven and one half inches. His greatest weight was 198 pounds, one year ago. Now has 180 pounds in his clothes. He smokes six to eight strong cigars a day. Drinks rarely. He has up to now enjoyed good health; usually eats one large meal a day at noon, the main element of which is meat. For breakfast, grapefruit, coffee, and rolls; supper, tea, bread, and butter. He is very fond of olives and of highly spiced food preparations. In January, 1914, sugar was noted in his urine, 2.1 per cent. (he had polydipsia and frequent micturition, and therefore took a specimen of his urine to the laboratory for examination). On April 10th a reexamination of his urine showed a reduction in the sugar to five sixths of one per cent.

Last Friday, 5 p. m., while walking in the street, he was suddenly seized with a pain in his chest. He managed to get to the barber shop (a short distance on) and sit down in the chair. After a time the pain passed. In the evening he had for supper boiled salmon and lettuce dressed with oil and vinegar, drinking only water. Two hours later, he was seized with a violent pain in his chest, about the middle of the sternum, which radiated into both arms. The pain lasted all night and a physician was called to attend him.

Test breakfast (E. and B.), one hour; tube; fifteen c. c. Stomach contents, bread and fluid. Ordinary appearance. React. blue litmus+React. Cong.+React. Phloroglucin van +free HCl. 28. Total acidity 57. Residue on filter looks fairly well worked up; considerable mucus, apparently of gastric origin, on it. May 6th. Further examination: Appearance of countenance, haggard and suffering; color, somewhat ashy. The pain, when it comes on, is at the left

sternal junction of the third and fourth ribs, and from there radiates into the precordium and arms. Heart normal in size. Sounds rather low but normal; pulse 70, fairly full and soft. Blood pressure, systolic 120, diastolic 100. Epigastrium: nothing abnormal to inspection or palpation; no sensitiveness anywhere; no splashing; water 58, no splash, no sound. Liver and spleen in situ normale. Abdomen negative; large panniculus. He reported that last evening about 7 p. m. he was again seized with the pain in his chest. He feels it still in his left hand.

Diagnosis: As to seizures: Angina pectoris. As to the stomach: a hyperacidity of the gastric secretion with a tendency to become excessive under stimulus. Glycosuria. *Treatment:* Diet: Cream mixtures, three table-spoonfuls of cream to six ounces of warm water, and eggs, medium or poached. *Medication:* Vichy (Celestin) morning and night. An alkaline powder with an addition of the extract of belladonna three or four times a day. Stop smoking altogether and abstain from alcohol. Seven p. m. Telephoned his pain is relieved. To continue as previously directed. May 8th. He is doing fairly well. Was free from the pain till last evening, when it set in again after running three or four times between the synagogue where he is employed and his home—a distance of one long block; was not severe and did not last very long. This morning only a faint sensation of it. The powders are inclined to purge him; he has had a loose movement after each one.

Directions: Diet as before. Omit the powders. Take sodii iodide, six grains three times a day. Troussseau's belladonna pill according to his directions. For the attack:

Sodii bicarb.,	3ii
Spirit ammon., aromat.,	3ss
Hoffmann's anodyne,	3ii
Aqua destill.,	q. s. ad 3iij.

M. Sig.: 5ss in aq. 3i pro re nata.

May 11th. Last Friday night he had another attack but not very severe. Last night he again had pain, but lower down than in the previous attack, rather more in the stomach. One dose of the aromatic mixture relieved him. May 14th. On the night of the 12th he was again seized with pain. This time, however, he said it was not in his chest but in his stomach. It came on after supper and continued all night. The aromatic ammonia mixture did not relieve. He had been very much on his feet that day. Directions: I told him in case of recurrence of pain to take one of the powders first ordered and repeat it every three or four hours till relieved, and increased the sodium iodide to seven grains, also to take two pancreo-pan tablets after the eggs. May 18th. He had been rather costive, so, Friday night (16th) he took an enema, which was effective, and he felt all right. The following morning he took a seidlitz powder and had several movements. Last evening, about 5 o'clock, he was seized with pain down in his abdomen, which lasted all night. He also had a pain in his back, and put on hot water bags, but with little relief. Presuming that much of the pain in the abdomen was due to flatulence, I prescribed:

Rhei. mist. et sodii,	3v
Hoffmann's anodyne,	3iij.

M. Sig.: 3i pro re nata.

If this brought no relief, then:

R Sacch. lact.,	gr. x
Codein.,	gr. ½
Camphor, pulv.,	gr. ¼

M. Sig.: 5i pro re nata.

Sig.: One powder for pain in stomach or bowels; can repeat in one hour if necessary.

To prevent costiveness or constipation a phenolphthalein tablet every other night. His weight today is 174½ pounds. May 19th. Last evening, about 5 p. m., he was again seized with the pain. He took three doses of the mixture without relief, then an enema, and had a very large hard gray stool. After that the codein powder, but as the pain continued he repeated it at intervals of an hour until he had taken three powders, then fell asleep and slept all night. Has had no pain today as yet. Has great thirst; feels parched; no appetite. Leave off the belladonna pills. The pains being evidently due to an insufficient secretion of bile and possibly also of gastric juice, I prescribed HCl, diluted, four drops in a glass of water, with his dinner and supper. For variety's sake allowed him a little plain boiled carrot with

his noon meal. Urine: Sugar free, but shows some uric acid gravel. May 20th. No pain yesterday and none today. Bowels moved by the phenolphthalein tablet. May 21st. Bowels acting freely. Occasionally gets a stitch in his back in region of kidney, most likely due to the gravel. Weight 175 pounds without coat or vest. May 24th. Feeling much better; has had no pain since. Stools yellow (egg yolk in color). Reexamined heart, normal. Sounds low. Pulse 62. Continue as before. Take the HCl twice a day with meals and continue with the phenolphthalein tablet effective. May 27th. Reported he had no movement yesterday; did not take phenolphthalein tablet because they gripe him; so took an enema this morning and had an enormous evacuation; first part yellow in color, second part grayish in appearance. A little later had to go to the toilet again and had a small yellow looking evacuation. Liver normal. Pulse 70; under a little excitation, two or three quick turns the length of the room, it came up to 80. Blood pressure, systolic 110, diastolic 90. Directions: Ordered kal. iodide, five grains three times a day. Continue the HCl dilut. and the pancreopepsin tablets. For the bowels a laxative water. Weight 172½ pounds in light summer wear, without coat or vest. June 2d. Doing very well. Said he walked a long block and felt a faint reminder of the pressure. Tongue clean. Gave him a Faradization (S. and R.) of the upper part of his chest and shock after the manner of Duchenne. To increase the potass. iodide to seven grains thrice daily. Leave off HCl. June 5th. Heart feeling very well. Can walk well. No pressure. Faradization as described. If all goes well till Sunday, he can then have some boiled chicken.

June 19, he had been out in the country for two weeks. Said if he walked fast, he would get the pressure, though much less than before; but at an ordinary gait he could walk a mile and a half without the least inconvenience.

Bowels regular. Has a constant desire to go to stool; passes much flatus. Stool yellow. Gave sodium salicylate two teaspoonfuls in three ounces of water, thrice daily, as an hepatic stimulant. June 22d. Stools same color, yellow. Appetite good; no pressure. Faradization. Leave off the sodium salicylate and resume the potassium iodide and the digestive tablets. Can have a mutton chop. June 26th. Faradization. Take the potassium iodide only twice a day. July 7th. Doing very well. (Weight 175¾ pounds.) Faradization.

Saw him on August first as he raised a long and very heavy scroll with his hands from a table, grasped it by the two handles at the bottom and raised it straight up before him, without the least discomfort apparently. He looks well and feels well; has gained eight pounds since I saw him. Happening to be in his neighborhood I saw him as he walked at a very rapid gait to his synagogue. Saw him later and questioned him. He had not felt anything unusual.

September 5th. He is looking well, ten years younger, face full and rounded out. Can walk, can even sprint when required. Is careful in diet. November 9th. Saw him this evening. He had a long black cancer on his mouth; and he was taking a cold smoke; has been smoking some the last few weeks. The pressure and pain, when he walks a little faster, are returning. To cut out the tobacco and come the day after tomorrow for treatment. November 18th. Saw him today. Asking him why he did not come for treatment as I had directed, he replied that he had quit cigars and the pain and pressure were disappearing rapidly. November 28th. Has no pain or pressure. Has tried himself by running the length of the block (a very long one), and has felt no discomfort. Could not do that before he quit the cold smokes.

January 1, 1917. He has had no recurrence of his angina. For a year he has been smoking again, but more moderately than before.

CASE VI.—November 7, 1915. E. M.; merchant, age fifty-nine; widower (four children); five feet four inches;

average weight, 142 pounds; at times he has gained ten pounds, but never fell below 140; usual net weight, 132 pounds. Never smoked. No liquors. About ten months ago he found that he had to get up frequently in the night to micturate. Consulted a physician, who said he had some irritation of the kidneys. Stopped eating red meat and fish, took only chicken and lamb chops. Four weeks later he consulted another physician, who pronounced him in good condition and told him he could eat anything he pleased. He, however, kept to his diet. For two or three weeks he belches much, especially when he has climbed some steps. After walking in the street a short distance he gets a pain in the upper part of his chest; it settles on his shoulders and goes down into his left arm. The pain is a heaviness, a pressure. He rests for a few moments and it passes; comes back again when he walks on again, but not as strong. He is better in the afternoon than in the morning. Appetite varied, good, medium, and bad. Occasionally he gets a pressure in his stomach after meals; becomes bloated; sometimes has heartburn. Breakfast: Cream cheese, dry toast, milk and water sweetened with sugar. Oatmeal causes heartburn. Coffee gives him a pain in the back and causes insomnia. Lunch: Milk (diluted somewhat with water) and crackers. Dinner: Lamb chops or chicken; vegetables; boiled onions, stewed fruit or macaroni and cheese, baked or broiled fish (whitefish or carp); hot water and milk. Occasionally he eats an orange, but he cannot eat any grapefruit now. No cold water. Bowels are constipated; takes interol or Pluto water, and once a week an enema. Headaches formerly, but not now. Sleep is usually good; the last few nights rather restless; had to get up several times in the night to urinate. Last night, after a dinner of macaroni, milk, spinach, dry toast, he had cramps. Tongue coated light white coat.

Examination: Blood pressure, systolic 115, diastolic 98. Heart normal in size. Sounds at base seemed slightly roughened, low in tone. Pulse: Right 57, left 55; slow, regular. Radial arteries felt somewhat stiff. Epigastrium: Negative to inspection or palpation. Sensitiveness to percussion in median line from one centimetre below xiphoid cartilage

not elsewhere. No splashing; water eight ounces. No splashing, but sound of water rolling out of the stomach. Liver and spleen *in situ normale*. Abdomen: Negative to inspection or palpation. Slight sensitiveness over lower half of linea spina u. dextra, but this is not positive, as when percussed there he feels the pain more in the epigastrium, in the median line. Likewise when percussion is made over the left linea.

November 9th. Test breakfast, one hour; tube, 25 c. c. Stomach contents, bread and fluid, ordinary appearance; bread well worked up. React. blue litmus + React. Congo + (str.) React. : Phloroglucin van + free HCl 58. Total acidity, 73. Reported he had very much heartburn last night. Diagnosis: Angina pectoris. Hyperacidity of the gastric secretion. Treatment: Diet: Milk (all milk warm with pinch of salt). Eggs (poached or medium or cold hard boiled); cereals, except oatmeal, white bread and butter. Vichy. Medication: Sodii iodide, six grains thrice daily. November 14th. For the first three days he felt somewhat better, but for two days has felt very bad again. Has much pain; short sharp pains in upper third of the thorax (on both sides). Heartburn. Headache. All his bones ache. Restless night; tongue gets dry in the night, feels stiff like leather; he must get up several times and rinse his mouth with water. He is constipated. Directions: Leave off the sodium iodide. For the stomach, an alkaline powder with bismuth and extract of hyoseyamus four times a day. For his bowels, phenolphthalein tablets as required. For the driving of his tongue (due most likely to his sleeping with his mouth open), a nasal spray of alcohol and menthol to be used at bedtime. For the pains in chest and bones, novaspirin as required; locally a salicylated unguent. November 25th. Still has some pressure especially after eating; still much heartburn, though less than before. When he has the pressure, he feels as if something were coming up into his throat. Sleeps well. Changed the powder slightly. Continue diet as before. November 27th. He telephoned this morning, no more heartburn, but some pressure. Resumed the sodium iodide. December 5th. Some days he has no pain at all. Still feels it when he walks fast. Had some heartburn this week; thinks the drops may have

caused it. As, possibly, the pain may be due in part to atmospheric changes (rheumatic), changed the medication to a belladonna pill (Trousseau) in the morning and sodium salicylate, twelve grains thrice daily. December 12th. Weight 133¾ pounds. Says the pressure is the same as before. Sometimes so severe that he feels it in both arms, especially when he walks uphill or upstairs, and more especially if he walks right after eating. He feels more desire for food; gets hungry more frequently. Sleeps better. (Had a sore throat a few days ago. Must have had an ulceration on his left tonsil; some traces of it still to be seen. Use an antiseptic mouth wash and gargle.) Gave him a Faradization (manner of Duchenne). Potassium iodide. Admitted that he does not belch as much as before and the pressure under the heart (gastrothoracic region) is not as strong. December 19th. Still complains of the pressure after eating. He has gained in weight (135¾ pounds). Continue diet as before directed. For the pressure take:

Bismuth subnit.,gr. v;
Sodii bicarb.,gr. iii;
Pancreat.,gr. v;
T. nux vom.,Mss. 3.

M. Ft. pulv. one thrice daily, five minutes after meals.

If necessary take a powder at bedtime. Continue the potassium iodide. January 4, 1916. He has had two attacks of grip; cough. Has a morphia or (codeia) cough mixture prescribed by the family practitioner, but feels very bad; cough racks him; has pains in his back; his nose is stuffed. Complains of pains in his epigastrium. Examined his lungs; did not discover anything except a slight bronchial irritation. Ordered him a mild expectorant mixture of ammonia carbonate and syrup of squills, and aspirin, ten grains, to be taken at bedtime. January 9th. His cough is much better. Thinks he has had more pressure since taking the iodide. After the powders he belches very much and loudly (can be heard at a distance), especially morning and noon, not so much at night when he is at home for dinner. The pressure under his heart (noted above) is gone. Continue the cough mixture and resume the powders. January 20th. Telephoned he is feeling much better. To continue treatment as directed. February 6th. He felt well till yesterday, when he ate something which disagreed with him (which was not in his diet list). A hot feeling in bowels. Pressure is gone. On the whole he feels much better and stronger. Complains of pain on left shin. For the bowels infusion of chamomile flowers. If the pain on the shin should continue, take a mixture containing sodium salicylate, leaving off then all other medicines. February 14th. Has been having pains over different parts of his body, which seem to be of a rheumatic character. They are apparently influenced very much by atmospheric changes; he feels good in fine weather and gets worse when stormy weather is coming. He has lost somewhat in weight; now 131¾ pounds. He also had a slight return of the pressure in the chest. Prescribed some antirheumatic medication (a vegetable pill). Advised a trip to Mt. Clemens. March 20th. Telephoned he thought the antirheumatic pills did not agree with him any more. He belches more since taking them. Says he slept heavier and felt heavier when he awoke in the morning. To stop the pills for three days and take the powders instead; then resume the pills for three days and report. April 4th. An examination of his urine shows a faint trace of albumin, a few small uric acid crystals. Urotropin tablets.

On April 23d he came in to say he is fifty per cent. better. Has no cramps, though he still belches considerably. Pressure only occasionally and then not marked. He has lost in weight, now 127½. This, I believe due to the rheumatic attacks of various character which he has had since the early part of February. Examined his heart. Could not detect anything abnormal. Pulse sixty, of fair force; soft. He is tired of his diet, does not eat with pleasure, belches much after eating. Allowed him a full diet with necessary regard to his hyperacidity. As he complains of his eyes I advised him to consult

an oculist who reported that patient had a myopia for fair vision and he had prescribed glasses accordingly.

CASE VII.—March 12, 1916. M. F.; male; age fifty; married; children; five feet 4 inches in height. Weight four weeks ago, 155 pounds; never weighed more. Never smoked. Drinks: Formerly a little whiskey with his evening meal; since four weeks none at all.

Seven years ago he had an attack of pain in his epigastrium which went through to his back. It lasted four weeks; two weeks of that time he was laid up in bed. Four weeks ago he had another attack, and the pain has continued since. When he walks half a block he gets the pain, a pressure through the chest, front to back, and must stop and gasp for breath. The pain shoots into his left arm; it feels cold, numb. Last night after drinking a glass of tea with lemon he was seized with a sudden compression of the chest, cramplike; had the same cramping sensation in the left arm; he did not feel the pressure in the back. When he is at home he is comfortable. When his stomach is empty he can walk a whole block before he gets the pain; when he has eaten, a walk of half a block brings it on. Appetite good; but lately he belches much. Breakfast, a glass of milk and a piece of cake; dinner, soup, chicken, stewed prunes, or orange, or baked apple; supper, herring or sardines, farina, or fried eggs, milk; cold water, formerly he drank a glass after each meal, since two weeks none; he thought it caused him pain. Bowels are regular. Once a week he takes a bottle of liq. citrate of magnesia, sometimes an enema. Headache only when he has the pressure. Sleep good; tongue rather clean.

Examination: Epigastrium, nothing abnormal to inspection or palpation; no sensitiveness anywhere; no splashing; water, eight ounces, no splashing, no sound. Liver and spleen *in situ normale*. Abdomen: Good panniculus; nothing abnormal otherwise; no sensitiveness anywhere. Heart: Size normal; sounds normal. Pulse 80, full, forcible, indicative of rather high blood pressure. I had intended to take his blood pressure a few days later, but he did not return after the last mentioned date.

March 13th. Test breakfast, one hour; tube, 25 c. c. Stomach contents, bread and fluid, well mixed, rather thick. React.: blue litmus + React.: Congo + React.: Phloroglucin van + free HCl 31. Total acidity 54. March 15th. Diagnosis: Angina pectoris. As to stomach: hyperacidity of the gastric secretion. Treatment: Milk, cereals (except oatmeal), eggs, white bread, and butter. Vichy (Celestin). Medication: Alkaline powder with belladonna. In case of constipation, phenolphthalein tablets.

It might perhaps be said that these cases belonged to the category of pseudo angina pectoris (mock angina of Allbutt), of gastric origin, a subdivision elaborated by Huchard (3), and looked upon as not at all serious; really, only an aggravated form of dyspepsia, and such was the diagnosis made by me and so recorded in my case books until the following case of severest type and ending quickly (as it were) in death came under observation.

CASE VIII.—May 16, 1909. Louis K.; barber; age fifty-two; married; three children; five feet seven inches. Greatest weight, 175 to 180 pounds, eight months ago. Smokes three or four cigars a day. Alcohol very rarely. For two months has spells. He is seized with a sharp pain about the præcordium and for the time being cannot move; must sit down at once. It will pass in a short time. Does not go into his arm. At the same time quite a quantity of water comes up into his mouth; it feels hot, but he does not know whether it is sour. The spells come on two or three times a day, mainly after meals. (That is also the time when he smokes.) Appetite good. Breakfast, oat meal, coffee with milk, two or three rolls; lunch, two hard boiled eggs, five or six slices of bread and butter, a bottle of milk-dinner (6 to 7 p. m.), soup, meat (no red meat), vegetable, salad, coffee. Drinks about four or five glasses of cold water a day. Bowels more than regular, two or three movements a day; natural, formed stools. Headaches rarely. Sleep not very good, especially lately. He is very restless in the night. Tongue, coated white coat. Teeth in good shape. Has a bad taste in his mouth. Examination:

Heart normal in size and sounds. Pulse of fair force, 85 per minute; occasionally one beat is dropped, sometimes after four beats, then again after fifteen or twenty, altogether about two or three per minute. Epigastrium negative. No sensitiveness anywhere. No splashing; water, eight ounces; no splashing; no sound. Liver and spleen *in situ* normal. Abdomen large, comfortable. Nothing abnormal to inspection or palpation. May 17th. Reported that he started out this morning and had walked but a few blocks and the pain came on, although he had eaten nothing. Had to get into a street car and ride down. Test breakfast, one hour; tube, 100 c. c. Stomach contents, bread and fluid, mainly fluid, very little bread; bread well worked up. All of normal appearance. React. blue litmus React. Congo + React. Chloroform can + free HCl 57. Total acidity 83.

Diagnosis: As to spells, angina pectoris. As to stomach, markedly hyperacid gastric secretion and gastroscorrrhea. 6 p. m. He sent word that he had had three attacks already and had suffered intensely. Directed an alkaline powder with one seventh of a grain of the extract of belladonna, to be taken every four hours. In case he is not relieved, to have half a grain of codeine and one fourth or half a grain to be repeated in forty minutes if necessary. For nausea, aromatic spirits of ammonia. Diet for the present: Milk only, six to eight ounces every two hours. Stop smoking absolutely. I advised him to keep quiet at home, but he persisted in going down to his shop. May 18th, 6 p. m. He had a slight spell at 5 a. m. The milk agreed very well with him today. Tomorrow can have some soft boiled eggs in addition to the milk, but no bread. Milk and Vichy, half and half, before retiring. He took but one codeine tablet last night. Is taking the powders as directed. Urine: Appearance, clear, transparent; color yellow. React. blue litmus.—React. red litmus + very faint. Sp. Gr. 1.025. React. heat +, addition of a few drops of acid renders it transparent again. Sediment, none. Indican, none. May 23. Has had no pain since previous visit. Only when he gets excited does he feel a slight pain. Epigastrium negative. The pulse of greater force, somewhat hard. May take a zwieback and have the eggs hard boiled. May 25th. Had an attack yesterday and another today. Thinks it is due to the zwieback and the hard boiled eggs. Leave off both and continue with the milk alone as first directed. Sodii iodide, five grains thrice daily. May 28th. He is worse than before. Has three or four attacks a day whether he eats or not. Attacks last for twenty minutes. Continue the sodium iodide. A tablet of nitroglycerine, 1/100 as required. He has a tic about the left eyelid (which I had not noticed before). He still smokes. Told him again to abstain. May 31st. The nitroglycerine relieves the severity of the attacks somewhat, but they recur with greater frequency. He had five attacks today. Continue the nitroglycerine. Codeine as before directed. June 2d. *In statu quo*, but attacks very much milder than before. Says a rather free perspiration breaks out on him when he has the attack. He has not passed any urine since yesterday. Take twenty grains of strontii bromidum (in solution) twice daily. Infusion of watermelon seed. June 3d. *In statu quo*. Give three tablets of a grain of codeine at once and repeat half grain in half an hour. After three or four hours repeat. At 6 p. m. reported only two attacks today, one in the morning and one in the afternoon. Continue the same way.

June 4th, the attendant did not get the directions right and instead of codeine tablets, she gave nitroglycerine tablets, nearly thirty tablets. I saw him this morning and he looks wretched, haggard. He is in bed and says the slightest motion, as an attempt to turn on his side, even gently, will bring on the attack. I discontinued the nitroglycerine tablets but continued the codeine, also gave aromatic spirits of ammonia as needed. Salol one gram every four hours. 8:30 p. m. The daughter telephoned that her father was suffering intensely, there was no rest at all for him. Has great burning in his stomach, much hot water coming up into his mouth. Has a pain over his heart, a burning feeling, with pain in right arm, and wrist and hand.

Directions: A tablespoonful of milk of magnesia in half a cup of milk. Repeat in two or three hours as necessary. For the pain, a suppository of morphia, one third of a grain. For the burning over the præcordium, apply an ice bag. June 5th. At noon his daughter called at the office and reported patient could not sleep last night, so they gave him a suppository per os, and he (naturally) felt quite nauseated after it. In the early morning he had had hot water come up into his mouth. At 6 a. m. they gave him a dose of Rochelle salts, but these had not worked as yet. I ordered a dose of milk of magnesia at about 2 p. m. (he was just having his noon meal, soft boiled eggs), to be repeated in one hour if necessary. If preferable, give enema. I saw him at 5 p. m. He said he was feeling better. He could not stand the ice bag over the præcordium. Pulse 92, regular. Heart's action regular; slight sensitiveness over the præcordium and pectoral muscle. Continue the salol. Give the suppository tonight. June 6th. Getting along much better. Salol every five hours now. Tired of milk; try cocoa. June 9th. This morning his daughter reported he had had pain all night. Did not have any suppository on hand. Directed: Morphia sulphate, quarter of a grain every two or three hours as needed. 6 p. m. Daughter reported it required two powders (the second forty minutes after the first) to relieve him. He still has some pain. Leave off the salol, and take sodii salicylate, fifteen grains every four hours.

June 26th. I saw him no more after the 9th, but today read a notice of his death. He had passed away the day before.

The only regret that I have in this case is that I did not carry out the treatment as first initiated with alkalies and with larger and more massive doses if it became necessary. But it is a very difficult matter to control an ambulant patient whom you see only occasionally and his family whom you mostly do not see at all, who all have their own ideas, especially in matters of diet.

The salol and later, the sodium salicylate, were given upon the presumption of a possible rheumatic basis, as muscular rheumatism is quite a common complaint in this locality about this period of the year.

Certainly this case can not be classed with the pseudo anginas. The severity of the spasms, their recurrence at a later period at such brief intervals as to seem almost continuous and above all the lethal exitus make it more than certain that here we have, as must be admitted by all, a genuine case of the malady and here also we have this special feature common to the cases previously recorded, to wit, hyperacidity of the gastric secretion.

Up to the present time the pathology of angina pectoris, or rather the direct cause of the spasm, is clouded in absolute darkness (4). Because of this we have the subdivision of pseudoangina (or mock angina) which is in no way distinguishable from the form hitherto regarded as the genuine. We have the anachronism of an epigastric, an abdominal angina pectoris (5), both an impossibility (6). It is very readily understood how these latter subdivisions came to be made. The diagnosis of angina pectoris once established in a case, spasmodic seizures in the epigastrium, in the abdomen for which no special factor was discoverable were naturally attributed to the angular status and called angina pectoris of the epigastrium or the abdomen. However, with the light thrown out by the cases here reported, the whole subject becomes clearly and distinctly illuminated.

It was Latham (7) who said that angina pectoris

is a spasm, a cramp, of the heart muscle. This spasm is excited by the hyperacid gastric juice through the filaments of the vagus (8). To him who is familiar with the violent spasms that can be excited by this hyperacid secretion as in spasmodic closure of the pylorus (gastralgia, spasmus ventriculi) and even elsewhere (as I shall show in a later communication) this cannot seem strange.

With this view as to the cause of the cardiac spasm, it is apparent that it may supervene in any and all the various forms of cardiac disease, in disease of the aorta, as well as in cases where the whole circulatory system is absolutely normal. It explains the many seeming contradictions set forth by Allbutt in his treatise on the subject referred to. It makes clear to us the intercurrent disturbances occurring in the epigastrium and abdomen, which are not at all due to the angina and which are frequently seen in cases of gastric hyperacidity in which no angina at all exists. It is for this reason also that I have given the histories in detail, to show more plainly that, having a hyperacid gastric juice disturbance, spasms may be excited in the stomach proper without any reference to the anginal attacks occurring at other times. It comports fully with the various etiological factors as set forth by Allbutt (9), Huchard (10), and others. It makes perfectly clear why tobacco should have so baneful an effect in this malady. It explains fully the excellent results claimed to have been obtained by that most eminent clinician, Trousseau (11), in the treatment of angina pectoris with massive doses of sodium bicarbonate and the extract of belladonna.

It accounts very satisfactorily for the deaths which have supervened suddenly, in persons suffering from angina pectoris after a full and liberal meal of various food preparations and the usual accompanying libations—a sudden outpouring of excessively acid gastric juice, a violent tonic spasm of the heart excited thereby (even as a violent spasm of the pylorus may be so produced), an arrest of action beyond restoration (12).

But that which is of the greatest importance is the hope that is held out to us that we may be able to relieve the patient permanently of that terrible pain, that angor animi, which, when it seizes him, makes the sufferer believe that his last hour has come. No more will we give our patient a box of nitroglycerin tablets to palliate, to relieve for the time being, but we will teach him how to reduce the hyperacidity of the gastric juice, to bring it within normal limits, and to keep it there; how to reduce the hyperirritability of the gastric mucous membrane and of the nerve filaments distributed throughout it, produced by the hyperacidity.

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STANDARD METHODS IN DIAGNOSIS AND TREATMENT OF VENEREAL DISEASES IN PUBLIC DISPENSARIES.*

BY HAVEN EMERSON, M. D.,
New York.

When the Wassermann test was accepted as approximately reliable for specific conditions, and the use of salvarsan was found to be so nearly a specific for treatment, it was evident that sooner or later standardized methods for diagnosis and treatment would become usual in laboratories and dispensaries. It is generally about ten years before the medical profession reads in textbooks the new facts and conclusions which are known in the research laboratories and practised and taught by the leaders of the profession. In a disease so important as syphilis, it is hardly fair to ask the community to wait until the profession as a whole has caught up with the facts of experimental medicine. It has therefore seemed worth while to attempt the standardization of the public facilities for diagnosis and treatment of venereal disease, not in any way attempting to interfere with individual medical practice, but to point out to the profession that where it offers service as a public facility in dispensaries or laboratories the public should have uniformly the best available. If the public facilities do not offer an adequate diagnosis and treatment, they should not be permitted to continue in operation.

The Advisory Committee on Venereal Disease of the Department of Health, consisting of Drs. A. N. Thomson, B. S. Barringer, J. A. Fordyce, E. L. Keyes, Jr., Victor Pedersen, E. L. Swan, Homer Swift, S. Pollitzer, Mr. F. J. Osborne, and representatives of the Department of Health, were asked to present a plan under which the diagnostic laboratories and dispensaries in the City of New York might be made to come up to a high grade of service for the diagnosis and treatment of syphilis and gonorrhea. Before this was done, a very careful survey was made of all the dispensaries where venereal diseases were treated, and it was found that of the thirty places in New York not more than four or five were offering the best treatment and follow up care. Taking the opinion of the leaders of the profession as to what a dispensary should be provided with and should offer, we prepared what we believed to be a conservative program. This was submitted to the Public Health Committee of the Academy of Medicine and endorsed by them.

The regulations that I have to present particularly apply to a section of the Sanitary Code, which reads as follows:

No public dispensary where communicable diseases are treated or diagnosed shall be conducted or maintained otherwise than in accordance with the regulations of the Board of Health.

Tuberculosis dispensaries, venereal disease dispensaries, and those for the treatment of other communicable diseases, as whooping cough and communicable eye diseases, etc., are included in this group. At the present time all the tuberculosis dis-

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pensaries are members of an association which requires compliance with certain rules for practice and follow up procedure, and they are more nearly standardized than any others in the city. They already comply with the regulations adopted by the Board of Health. There is only one whooping cough dispensary in the city, but we hope that others will be established and that they will be established under conditions somewhat different from others for children.

Venereal disease dispensaries come within the meaning of this section. The principles that governed the committee were the principles applying to the sanitary control of communicable diseases, namely, that it is the physician's inevitable responsibility to maintain supervision when he is aware of the presence of a disease which the patient, in his ordinary mode of life, would communicate to others if not subjected to a certain control. All such cases (all communicable diseases) must be reported to the Board of Health. After the report is made, some one must be responsible for the treatment of the condition during the communicable stage of the disease so that this stage may be as brief as possible. We believe that the physician who is aware of cases of venereal disease is responsible for carrying out such treatment and placing his patients under such conditions that they will be cured, or the disease will be no longer communicable.

The regulations as in force are perhaps familiar to you, but I should like to take them up one by one. In the first place, owing to the special character of treatment needed, we have asked that the treatment of syphilis be not spread through all classes in dispensaries, but be localized in a special department or in the dermatological department.

Regulation 1. Treatment of Syphilis; Special Department.—The treatment of syphilis, whatever its manifestations, shall be conducted in a special department maintained for such purpose or in the department for dermatology connected with the dispensary or hospital. Provided, however, when the nature of the part affected, such as the eye, throat, viscera, etc., necessitates treatment in some other department of the dispensary, treatment may be given jointly by the two departments.

A syphilologist will see the patient and, if necessary, call for and receive the benefit of the therapeutic advice and diagnostic skill of other departments.

Regulation 2. Microscopical Examination Required.—Every department for the treatment of syphilis shall make microscopical examinations of all suspected lesions.

In many a case, positive diagnosis at the time the patient presents himself will save more secondary cases due to personal contact than an unlimited number of positive Wassermann tests in the tertiary stage of a disease. Immediate diagnosis may save a group of persons in the home or shop from infection the next day.

Regulation 3. Wassermann Tests.—Laboratory facilities for making Wassermann tests should be provided in every dispensary. If such laboratory facilities are not so provided, provision shall be made for the prompt delivery of specimens to the Department of Health or other approved laboratories where such tests are made.

Obviously, it is the duty of the city to put at the service of the patient and of physicians, dispensaries or hospitals, its own diagnostic laboratory service.

Regulation 4. Number of Patients to Be Treated.—The number of patients to be treated at a dispensary shall be

regulated by the number of physicians in attendance and the equipment and facilities provided in the dispensary. The maximum number of patients treated by a physician shall not exceed ten per hour.

Few private physicians would expect to arrive at a well considered diagnosis or satisfy the needs of education and advice for his patient in six minutes, and yet in the practical operation of well organized dispensaries, where clerical and nursing assistance and properly coordinated work among the physicians are arranged for, good clinical results and excellent service can be provided if no more than ten patients an hour, including new admissions and revisits, are accepted.

Regulation 5. Salvarsan or its Analogues to Be Administered.—In view of the fact that the obligation to render a person affected with an infectious disease innocuous at the earliest possible moment rests on the institution to which the patient has applied for treatment, salvarsan or its analogues, in sufficient quantities and at proper intervals shall be administered, with the addition of mercury or other accepted means of treatment, to all cases of syphilis.

The dispensary managers may properly reply to this: We have no money to purchase the required medicaments with. The city is forcing us to provide something we cannot afford, or which the patients cannot afford to get themselves. Experience in the operation of dispensaries, as for instance the one operated at the Brooklyn Hospital, shows that ninety per cent. of the applicants for treatment of venereal disease are willing to pay the cost of the specific medicines used in the treatment of their diseases. Furthermore, I have included in the budget requests for the Department of Health, for the year 1918, the sum of \$1,000 to be used to defray the cost of salvarsan or its equivalent for patients in the communicable stage of syphilis, who have been reported to the Department of Health and are known by the dispensary or hospital to be unable to pay for the drug. This sum, small and inadequate as it is, together with the payments voluntarily made by patients able to pay for their own treatment, will go far to meet the needs of most of the cases applying for dispensary care. It is my opinion that the city ought to make salvarsan, or any other drug which is recognized as a specific for the treatment or cure of any communicable disease, as free to a case of the disease in its communicable stage as diphtheria antitoxin is to be poor of this city at the present time, under proper certification of the attending physician.

Regulation 6. Records.—A complete and adequate record shall be kept of every case of syphilis treated at a dispensary. Such records shall not be open to inspection by the public or to any person other than the representatives of the Department of Health of the City of New York, and such persons as may be authorized by law to inspect such records.

The propriety of such a requirement must be obvious, and as a matter of fact is accepted by those who maintain dispensaries which serve the patients well and have business standards of administration, as well as clinical records adequate and available for study by the physicians in charge.

Regulation 7. Attendance.—A system, approved by the Department of Health, to secure regular attendance by patients shall be established and maintained.

There are so many ways in which records can be devised and kept, by which this requirement

would be suitably met, that it is inadvisable to specify the particular kinds of records or procedure to be followed; but just as a physician would be unwilling to be held responsible for the care of a case of typhoid or scarlet fever, without knowing the progress of the disease until cured, or under what conditions the convalescent stage and period of non-communicability were reached, so with syphilis, we feel that a dispensary offering treatment should hold itself responsible for keeping track of the patient until he is no longer a menace to the public.

Regulation 8. Procedure Governing the Discharge of Patients.—A standard procedure governing the discharge of patients shall be followed. Such standard shall embrace suitable tests and subsequent persistent observations.

Again, in this regulation, provision is made for a method upon which the dispensary and physicians in charge can rely, before considering their responsibility at an end with regard to the treatment or rendering a patient presumably safe from a relapse or recrudescence of the disease. Provocative specific treatment and repeated Wassermann test may not prove to be the only or best way of arriving at a conclusion as to cure, but whatever methods are found by the serologists and clinicians as satisfactory, should be made uniform in the disease in which the consequences of incomplete treatment are so shocking to the individual and his family and so costly to the community.

Regulation 9. Dispensaries to Be Open at Least Three (3) Days a Week.—Dispensaries shall be open at least three (3) days a week.

This regulation requires no particular comment, except to indicate the interest of the Department of Health in what may be considered an adequate service, if any service at all is offered for the diagnosis and treatment of syphilis.

With regard to the regulations for the operation of classes in dispensaries for the treatment of gonorrhea, they are quite similar, with the exception of Regulation 3. This reads:

Regulation 3. Urethroscopic and Cystoscopic Work to Be Performed.—Every dispensary shall be provided with facilities for urethroscopic and cystoscopic work, and such facilities shall be regularly employed by the physicians in attendance.

This is found to be necessary by those attempting to give a service adequate to the prevention and diagnosis of those extending lesions of gonorrhea which are easily overlooked or treated in a slipshod way, if direct inspection of the urethra and bladder has not been accomplished.

In addition to the section of the Sanitary Code above described with its regulations in detail, an important new section, with regulations, has been recently adopted, expressing the interest of the Board of Health in a high standard of laboratory facilities for the diagnosis of all kinds of communicable diseases. It is as follows:

Sec. 105. Diagnostic Laboratories Regulated.—No laboratory offering facilities for the diagnosis of communicable diseases shall be conducted or maintained in the City of New York without a permit therefor issued by the Board of Health or otherwise than in accordance with the regulations of the said Board. (As adopted by the Board of Health, June 28, 1917.)

Regulation 1. Applications.—Applications for permits to conduct and maintain laboratories offering facilities for

the diagnosis of communicable diseases shall be made by the person in charge of the laboratory upon official application blanks furnished by the Department of Health.

Regulation 2. A Duly Qualified Person to Be in Charge.—The person in charge of the laboratory shall be a duly licensed physician or a person whose qualifications are satisfactory to the Department of Health.

Regulation 3. Specimens to Be Numbered.—Every specimen received at the laboratory for the purpose of determining the presence of communicable diseases shall be numbered and so designated as to definitely establish the identity of each particular specimen.

Regulation 4. Records to Be Kept.—The person in charge of the laboratory shall cause a record to be kept wherein shall be entered the following information:

a. The laboratory number and date of the receipt of every specimen to be tested to determine the presence of a communicable disease.

b. The result of the laboratory test. The Department of Health may, in its discretion, require every such laboratory to furnish a statistical report covering a stated period and embodying the above specified information.

Regulation 5. Equipment.—The laboratory shall be equipped with adequate facilities to properly perform such tests of specimens as the laboratory undertakes to make.

Regulation 6. Methods.—The methods employed shall be such as are generally recognized as effective.

Many instances of unreliable and misleading laboratory reports have come to my attention, showing that they were prepared from insufficient material, by subordinates wholly untrained and incapable of carrying out the necessary technic for the determination of the Wassermann test, or the presence of typhoid bacilli in the stools, or the simpler morphological tests for tubercle bacilli and diphtheria bacilli. The private laboratories, of which there are many in town, operated by men of the highest professional attainments and equipped with the most perfect and up to date apparatus, have cooperated in every way with the department in the establishment and maintenance of a minimum standard for diagnostic laboratories. From time to time samples will be sent from the Department of Health to test the quality of diagnostic work turned out by the private laboratories, a procedure which has been found valuable throughout the State of New York, as instituted by the State Department of Health. The reliance of physicians and patients upon the laboratory reports is too important a matter to be subjected to the suspicion of charlatanism or quackery, into which much of the routine medical treatment has fallen, both selfadministered and obtained through unprofessional sources at drug stores. Another important addition to the body of law, directed toward the prevention of venereal disease, is the recent change in the Domestic Relations Law of the State, which requires that applicants for marriage licenses should make the following declaration:

I have not to my knowledge been infected with any venereal disease, or if I have been so infected within five years I have had a laboratory test within that period which shows that I am now free from infection from any such disease.

The value of this query, put to the applicants for marriage licenses, will be chiefly educational for some time to come, but it would appear a more logical and safer requirement than some of the more radical demands made by state legislators in other parts of the country.

Another safeguard thrown, by the laws of the state, around the unsuspecting, ignorant, or foreign-born citizen, is the law which forbids the advertise-

ment of services or materials for the treatment of venereal or sex diseases. I refer to Section 1142-a of the Penal Law, which reads as follows:

Sec. 142-a. Advertisements Relating to Certain Diseases Prohibited.—Whoever publishes, delivers, or distributes, or causes to be published, delivered, or distributed in any manner whatsoever an advertisement concerning a venereal disease, lost manhood, lost vitality, impotency, sexual weakness, seminal emissions, varicocele, self-abuse, or excessive sexual indulgence and calling attention to a medicine, article, or preparation that may be used therefor or to a person or persons from whom or an office or place at which information, treatment, or advice relating to such disease, infirmity, habit, or condition may be obtained, is guilty of a misdemeanor and upon conviction thereof shall be punished by imprisonment for not more than six months, or by a fine of not less than fifty dollars nor more than five hundred dollars, or by both such fine and imprisonment. This section, however, shall not apply to didactic or scientific treatises which do not advertise or call attention to any person or persons from whom or any office or place at which information, treatment, or advice may be obtained, nor shall it apply to advertisements or notices issued by an incorporated hospital or a licensed dispensary or by a municipal board or department of health or by the department of health of the State of New York.

A marked change in the advertisements of the *Police Gazette*, of various of the Italian newspapers, and many other foreign language newspapers sold in the various racial groups within this city, has already occurred. All the papers in the city have been warned that this state law will be rigidly enforced in the City of New York, and we trust that physicians will direct our attention to any advertisements which, to their mind, constitute a violation of the spirit or letter of this law.

A contribution to the control of venereal diseases, which is little known and has been availed of to a very slight degree up to the present time, is the authority of the Board of Health to treat any infectious or communicable disease in its communicable stages, just as we now treat smallpox, namely, by removal to one of the contagious disease hospitals of the Department of Health or to a hospital designated by the department for the receipt of such cases. In order to apply this principle, where necessary, to cases of venereal disease in the communicable stage, who either cannot or will not provide for themselves adequate treatment and supervision, so that their neighbors and fellow citizens may be adequately protected, the Department of Health has now nearing completion and about ready for occupancy and use a small building for venereal diseases on North Brother Island, capable of receiving sixty patients, men and women. The medical staff is already appointed, individuals infected with syphilis and gonorrhea have been taken through the police power and the Board of Health, and held for treatment until no longer in a communicable stage of the disease. Just as cases of irresponsible, homeless, ignorant, or vicious pulmonary tuberculosis have, for many years past and to an increasing degree, been removed from lodging houses or crowded tenements, to Riverside Hospital, so, in the future, the same type of venereal disease cases will be removed and held as a danger to the public. This will still leave a large responsibility for the other hospitals of the city, where, at present, there is a shamefully inadequate provision for the patient with gonorrhea or syphilis, man or woman, or child, who

should, from the point of view of the physician, be treated with the same consideration and the same efficient care as patients suffering from other diseases, which are not supposed to carry the same stigma of immoral conduct with them. It is not for the physician to judge his patient's immorality. His business is to prevent, relieve, treat, and, where possible, cure disease, and in accomplishing these ends it is obligatory upon him to play his part as associate with the officers of the Department of Health in carrying into effect the various laws and regulations above described. With such cooperation as has, at all times, been given, to my personal knowledge, to the Department of Health, within these past four years, by the members and officers of your society, and in particular by the physicians who have made the Brooklyn Dispensary a Mecca for all students of the venereal disease dispensary problem, we should accomplish a reduction in the duration of the communicable stage of syphilis and gonorrhea and prevention of many of the permanent disabilities which now crowd our chronic hospitals and asylums.

VACCINE THERAPY IN CHRONIC INTESTINAL TOXEMIA.*

By G. REESE SATTERLEE, M. D.,
New York.

The diagnosis of specific bacterial infections of the intestinal tract from bacterial findings in the feces is often very unsatisfactory for the reason that the presence or absence of specific bacteria are often of no diagnostic import. The common infections of the intestine are tuberculosis, typhoid, bacillary dysentery, syphilis, diphtheria, staphylococcus and streptococcus infections, amebic dysentery and colon bacillus infections. Among the rarer conditions are actinomycosis, bacillus aerogenes capsulatus and pneumococcus infections and the plague. A few of these can be positively identified by microscopical findings, but, in many of them, the mere presence of the organisms in the feces is of no real value. Quantitative tests for the common bacteria in the stools, except perhaps in children, seem also to be of no real value.

Among the different theories of the causation of chronic intestinal toxemia, the bacterial theory seems to me to be the most attractive and tangible. If not the sole factor, it is at least a very important one. We must from the start make a distinction between putrefaction of intestinal contents and the other slower and more insidious condition, called, for want of a better term, chronic intestinal toxemia. We cannot prove the nature of it any more than we can explain that of uremia or eclampsia, but we can probably fall back upon two main factors, epithelial cells and bacteria, with a contributing element of chemical changes in the contents of the gut itself.

Our modern conception of chronic intestinal toxemia is that of a chronic diffuse toxemia of intestinal origin, the result of aberrant biochemical conditions, usually, but by no means always, bearing a measurable ratio to the delay in the onward passage of the

*Presented before the Medical Association of the Greater City of New York, December 17, 1917.

intestinal contents as visualized by the Roentgen ray (Lynch, Draper, Satterlee) (1).

The colon bacillus has its normal habitat in the large bowel, where it probably plays an important part in the end of digestion. Researches (2) show that the colon bacilli elaborate materials which exert marked inhibitory influences on the putrefactive bacteria in the intestine, particularly the *Bacillus putrificus coli*, and in this way prevent the origin of intestinal autointoxication. Carbohydrate oxidation and fat decomposition; fermentation, not putridity, are caused by the *B. coli* action. Under normal conditions it lives a saprophytic existence and is not only harmless but beneficial to the host. We will see, therefore, that it is probably for this reason that results from sterilization of the intestinal tract have no lasting effect on the intestinal toxemia when the toxemia is thoroughly rooted in the system. When the colon is diseased, however, the colon bacillus is distinctly harmful, either in the walls of the colon or when lodged in other parts of the body, as the peritoneum, genitourinary or respiratory tract, etc. It is then capable of becoming pyogenic and its intracellular poison is set free and can then act on the body of the host. Vaughan (3) says the bacterial cell must die to liberate the poison. Deaver (4) states that the *B. coli* isolated from the intestine in case of disease of that structure is more virulent than that from the normal intestine. We quote Adami (5), who says that under ordinary circumstances the *B. coli* is incapable of forming ectotoxins, but when the intestinal mucosa is affected by traumatism from within or without, it may wander and cause inflammation and thus liberate toxins. It is necessary under these circumstances that bacteriolysis take place through a breaking down and liberation of the resulting split products.

I believe that a severe gastroenteritis or a severe acute disturbance of the gastroenteric functions is often the starting point and causative factor for the biochemical changes in the intestinal epithelia and the *B. coli* that occur later on in the disease. The condition of chronic intestinal toxemia is not altogether unlike that of intestinal obstruction, in which the intestinal epithelia probably play an important part, as shown by J. W. Draper's (6) experiments of causing the symptoms in animals by feeding heterologous jejunal and ileac epithelial cells. Murphy and Brooks (7) also caused symptoms of intestinal obstruction and death in animals by injecting intravenously epithelial cells of isolated loops of the small intestines. They consider the symptoms and cause of death to be due to absorption of a toxin which is formed by bacterial growth and does not pass through a normal mucous membrane.

From clinical study of my cases, I believe that after an intestinal toxemia is once established, the effect on all the body cells may be of long duration, and that it is not merely a local condition, but a general one. It is essential to establish a diagnosis of chronic intestinal toxemia, which can only be accomplished by an exhaustive study and careful elimination of other diseased conditions which may coexist. The diagnosis of chronic intestinal toxemia is based upon four chief factors, the history, the x ray and the symptomatology and physical

signs. The history of these patients begins frequently with an attack of acute indigestion, and often a so called ptomaine poisoning following the ingestion of some easily decomposed or indigestible article of food. This is followed by a prolonged interference with the digestive system and by nervous disturbances, the latter frequently predominating. The primary trouble is probably an intestinal putrefaction, the secondary a chronic intestinal toxemia in which the colon bacillus, metamorphosed, plays the important rôle in the toxins liberated. Routine examination of the feces is made on every patient, but not, however, until they have been on a fixed diet for about a week. The value of excessive fermentation or putrefaction under these circumstances can be readily seen. Protozoa or parasites should of course be excluded. Among the bacteria that we have especially worked on are the streptococci and colon bacilli. In cases where there were an excessive number of streptococci, autogenous vaccines have been used with no apparent results, but with the colon bacilli we have had satisfactory and, in some instances, remarkable results. The type of case has been that which has been classed under the diagnosis of the chronic intestinal toxemias.

If the colon bacillus does play as important a role in this trouble as we think, the logical thing to do is to supplement our routine therapy by vaccines or serum. The serum, so far, is not very practical on account of the extreme toxicity the colon bacillus has on animals. This is, moreover, a chronic process, and time can be given to the body to form its own antibodies. Autogenous colon vaccines have not been used very extensively, but have been given in colon infections of the genitourinary tract with more or less success. Stock colon vaccines are used extensively, but are of little value on account of the large number of types of the colon bacillus. For the control test in the agglutination of colon bacillus infections, the serum agglutination test would be very valuable if it were reliable. A. G. Bennett, in his work with us on the subject, has found that the serum of other individuals not suffering from toxemias of colon origin agglutinate also the colon bacillus. Dugeon found that the blood serum of a patient who has a hemic infection with the bacillus coli may not agglutinate the colon bacillus. This might be accounted for by the numerous different strains of the colon organism. We have tried the patient's serum against their own organism without success. For this reason, agglutination tests have been discontinued on my cases. The opsonic index is unreliable, difficult, and has not been practiced. Leukocyte and differential counts were done on a number of the early cases, but were discontinued, as no change after the vaccines was demonstrable. The conclusion is that the index of improvement is the patient's general improvement in the color of the skin, abdominal symptoms, the disappearance of colon crepitation, tenderness and splashing, the disappearance of the headache, neuralgias and myalgias, and, above all, the mental improvement. The finding of colon bacilli in the blood is not necessary for the diagnosis of infection by this organism; if we had to wait for that we might never make a diagnosis, because it is very

infrequently found. What we have to contend with is not the number of colon bacilli, but the virulence of the organism, and the degree of resistance of the individual. The organisms should be obtained from the cecal contents following a full dose of castor oil. The method of isolation of the colon bacillus and preparation of the vaccine follows the ordinary bacteriological routine for this particular organism.

TECHNIC OF ADMINISTRATION OF VACCINES.

The initial dose is from ten to twenty-five million of the dead bacteria subcutaneously, depending on the amount of toxemia in the individual. This dose is repeated at intervals of every four to seven days. The dosage is gradually increased by twenty-five million each time until the maximum of 200 or 300 million bacteria is reached. Relief of symptoms is not usually obtained until three doses have been given. Occasionally quick response is seen, and in most uncomplicated cases three months of treatment give permanent relief.

In those patients who have a relapse, quick response to vaccine injections is usually seen. In very obstinate cases it may be necessary to continue the vaccine treatment for a year or more. A reaction after the injection of the vaccine usually occurs. This consists of a local redness, the size of a fifty cent piece, pain and swelling at the site. In a severe reaction this swelling spreads until the whole upper arm is involved. This local reaction begins in six to eight hours and lasts twenty-four to seventy-two hours. At the same time a general reaction takes place. A brief description of this is that there is an exaggeration of all the symptoms: headache, malaise, vertigo, and occasionally nausea. A decided increase in the severity of neuralgic or myalgic pains, and of pain, soreness or discomfort in the abdomen, if these symptoms had been present. This reaction is followed by decided relief of all the previous toxic symptoms. In markedly toxic cases, if an active colon organism from the diseased part of the colon has been obtained, early reactions are severe. The reactions have usually been severe in most cases in which excessive doses, such as 300 to 1,000 million bacilli, have been administered.

In those cases in which no reaction is obtained the cause may be (a) attenuation of the organism from which the vaccine has been made; (b) previous immunization of the patient, as after prolonged dosage of vaccine; (c) mild degrees of toxemia, or (d) absence of colon bacillus toxemia in the body. In the last stated cause, by elimination the vaccine becomes of value in diagnosis. In no case of profound intestinal toxemia, as yet, has there been a complete absence of reaction following the administration of the vaccine. The converse also holds good, that in no case in which a sharp local and general reaction has taken place could we exclude chronic intestinal toxemia.

Loose bowels and intestinal evacuation have occurred in quite a few instances, following the vaccine injections, and improvement continued. For the diagnostic value of local reactions following vaccine injections, I refer to Noble P. Barnes (8).

The following classification for the use of autogenous colon vaccines has been suggested by the

author's success in the vaccine therapy: mild chronic toxemias which do not respond to diet; all severe chronic toxemias; operative cases, before and after operation; doubtful cases, as an aid to differential diagnoses.

It is essential to make a thorough study of every case, which includes a radiographic gastrointestinal investigation. Symptomatology is very important, but we should not take any one's word or personal opinion about the state of his bowels. In numerous instances "absolutely regular bowels" are proved to have large residues. It seems pretty certain to the writer that all patients with chronic intestinal toxemia have had a constipation at some time, and that this is a very strong etiologic factor, and also that the laxative habit does not cure, but rather aggravates the toxemia. To prove this we find many "residual cecums," "sigmoids," etc., in patients who have regulated bowels by taking cathartics or laxatives regularly. But these patients have symptoms of toxemia, which are frequently not recognized. Nature often finds its own best relief, so we hear often that "the osteopath has given me most help, but has not cured me." On account of the predominance of nervous and mental symptoms, these people frequently consult the neurologist, who, if thoroughly up to date, should recognize the trouble and institute proper diagnosis and treatment. There are undoubtedly many cases of primary nervous system lesions in which the gastrointestinal toxemia is secondary. There is every reason that these patients should have the proper care of the toxemia, even if it is a secondary complaint. The insane asylums claim their share of chronic intestinal toxemias. As example, three of the patients under consideration for this paper had been declared insane, and are now well. One patient, an old lady of seventy-six, with the diagnosis of senile dementia, had the mental symptoms cleared up for weeks at a time by means of dietetic measures and autogenous colon vaccines, with remarkable and lasting results.

The nature of this presentation, and lack of time, make it inadvisable to give any detailed case histories. A detailed analysis of sixty-four cases has already been published in the *Journal of the American Medical Association*, December 9, 1916. Since that time there has been no reason to believe this method of therapy a failure.

I would like to describe one case (9), that of a patient who had intestinal toxemia for years, with profound depression amounting to insanity for two years. The urine was saturated with indican, and she was mentally incompetent. The colon was kinked and diseased. Developmental reconstruction of the colon was done by Lynch and Draper, but the mental condition became worse, with delirium and coma, severe albuminuria with all kinds of casts, and for a week she was expected to die hourly. Autogenous colon vaccines were given, followed by very severe reactions, increased delirium, restlessness, and the patient had to be restrained to the bed. These reactions lasted for from eight to twelve hours, followed by a period of calm and general improvement, and a diminution of the indican and albumen and casts. Vaccines were administered every four days for a month and a half, when they

were discontinued, the patient leaving the hospital weak, but in good mental condition. It was then for the first time that I obtained an intelligent connected history from her. Two years after the operation she was in good physical and mental condition. I quote from the nurse's notes:

November 4, 1914. Second dose of vaccine, 75,000,000. Slight rise of temperature, marked rapidity of pulse, extreme restlessness, and slight delirium, lasting twelve hours.

Doctor's notes on November 16th, the beginning of the sixth week after the operation.

Marked improvement in the general condition and spirit; noises in the ears still present; crash of paper causes agony; can read the dial on the watch for the first time today.

Nurse's note on November 20th, after the sixth dose of the vaccine:

Difficult breathing; immediate weakening of the pulse. One hour after, pulse hardly perceptible, responded to stimulation slightly; weak and exhausted condition; lasted twelve hours.

Urinalysis: albumin diminished, indican still in large quantity.

December 2d. Ninth dose of the vaccine, 100,000,000; reaction very slight, general condition improved. Urine, no albumin, moderate amount of indican. Apparently the colon vaccine saved her life.

CONCLUSIONS.

The predominating factor in the symptomatology of chronic intestinal toxemia is the colon bacillus.

In diseased conditions of the colon, the colon bacillus may become very harmful to the human organism by forming and liberating toxins, thus causing a toxemia.

This toxemia gives a definite symptomatology called chronic intestinal toxemia.

Putrefactive organisms often play an important part in intestinal toxemia, but the lasting effects are due to the colon bacillus.

In the study and treatment of all long standing or severe chronic intestinal toxemias, autogenous colon vaccines should be administered in proper doses.

Autogenous colon vaccines are helpful in the diagnosis of chronic intestinal toxemia.

The method of action of the colon bacillus vaccine is probably an immunization and sensitization of the body cells.

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125 WEST FIFTY-EIGHTH STREET.

The Surgical Treatment of Pernicious Anemia.

—C. K. P. Henry (*The Canadian Medical Association Journal*, February, 1918) from a review of the literature and personal experience concludes that this disease continues to be uniformly fatal, but that the life of the patient is prolonged by splenectomy and transfusion. After splenectomy, when the case is clinically greatly improved the blood picture still is that of typical pernicious anemia. The splenectomy is always best preceded by transfusion.

SOME ASPECTS OF SYMPTOMATIC TREATMENT.*

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In that not very remote period of medicine before vaccines and serums and internal secretions and metabolism became therapeutic catch words, a period which we sometimes allude to as the prescientific period, treatment was generally described as of three kinds, specific, expectant and symptomatic. The specifics in those days were very few, and expectant treatment was unpopular; symptomatic treatment occupied most of the field. Even now, when true specifics, mostly biological, are constantly being discovered, symptomatic treatment constitutes a very large part of medical practice. But increase in our scientific knowledge, particularly in our knowledge of physiology, brings up certain questions in connection with symptomatic medicine.

One is: What is a symptom, and to what extent is symptomatic treatment rational or permissible?

We may define a symptom as an unusual functioning of the body, or, to use more precise terminology, as functioning which is abnormal, hypernormal or hypnormal. Unusual functionings are more or less regularly associated with disease conditions, and also occur without demonstrable pathological basis.

Symptomatic treatment, as a universal dogma, rests on the assumption that these unusual functionings are themselves morbid manifestations, or a part of the disease, and as such deserve to be suppressed or abated. Acting on this assumption, fever has regularly been reduced as a bad thing, diarrhea has been checked, constipation has been overcome, pain has been dulled, high blood pressure has been lowered, etc.

But is this assumption correct? Are symptoms essentially morbid manifestations?

Study of the processes of nature convinces us that whatever nature does regularly is usually done for a constructive purpose. Nature is not an anarchist, she is a conservative. The conservation of a normal state of health is one of her prime objectives, and when she does something unusual in unusual conditions, especially if she has been observed to do the same thing regularly in similar conditions, the presumption is that she is acting constructively and not destructively.

The symptom of high blood pressure is a clear illustration of this point. Accepting the doctrine that whatever the circulatory apparatus does regularly is in the interests of an adequate circulation, high blood pressure appears as a manifestation of compensatory activity to meet some circulatory requirement. It may signify that the organism is trying to maintain an adequate circulation in the presence of some obstruction, or of some extra demand for elimination; the high pressure may be required for the benefit of a vital region whose blood supply is impeded by arteriosclerosis; or it may be required for elimination of waste products whose elimination has been rendered more burdensome or more difficult by pathological changes in the kidneys or else-

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where. It appears plainly as a physiological instead of a pathological procedure, and as regularly useful rather than harmful.

Fever appears, perhaps, a more recondite symptom than high blood pressure; but we cannot doubt that in general, fever is also an evidence of Nature's reparative activity, perhaps part of her curative plan and not a disease; although the contrary idea has so far prevailed that the name of this symptom has been incorporated into the names of several diseases, as typhoid fever, scarlet fever, intermittent fever, etc., thus perpetuating the mistaken notion of its nature. The following facts seem to give the clue to the meaning of fever: Invasion of the body by pathogenic bacteria, except when the invasion is local or trivial, is regularly attended by a rise of temperature; and in invasion by pathogenic plasmodia, as in malaria, the same thing may happen. In those bacterial and plasmodial diseases which are regularly accompanied by a continued or an intermittent fever, the febrile movement diminishes or ceases when recovery is in sight or the activity of the pathogenic microorganisms has been controlled. In general, the height of the fever is in proportion to the severity of the infection. In cases in which the height of the fever does not correspond to the severity of the infection, but is comparatively low, the prognosis is generally worse than when it is as usual: pneumonia with a considerable involvement of lung or a virulent type of pathogenic organism, and a comparatively low temperature, has generally a worse prognosis than when the fever is of the customary degree. The presence in the blood of the toxins of pathogenic bacteria, introduced as vaccines, regularly excites a reaction fever, as if the body inferred from the presence in the blood of the toxins of the bacteria the presence of the bacteria themselves, and reacted accordingly. Also, absorption of toxins produced in the alimentary canal by bacterial activity may similarly excite a reactionary fever.

Diarrhea, in general, appears as nature's attempt to rid the bowel of matters which disturb it. Constipation is not always easy to understand, but sometimes it can be interpreted as a conservative action on nature's part, as in certain inflammatory conditions in and around the alimentary canal. Pain is plainly nature's method of letting us know that something is wrong with our body, and in most cases the region of the body where the trouble is located is indicated.

With this understanding of the nature of symptoms, viz., that they are regularly evidences of Nature's work in combating disease, if not part of her combative process itself, what becomes of symptomatic treatment? Have we any warrant at all for treating symptoms?

The answer to this question is a qualified yes; for we have it under certain conditions; and it is this:

While Nature's intentions are always right, and while she always works in the right direction, she has not yet achieved, through the slow process of evolution, perfect and universal success in her adaptation of means to ends. She has not yet become absolutely and altogether efficient in her therapeutic procedures, wonderful though her accom-

plishments are. One of the failings which she sometimes shows is in not knowing when to stop, especially in conditions which do not yield readily to her constructive procedures. In the presence of very difficult or insuperable conditions she sometimes loses her head, so to speak, and keeps on with her hyper- or hypo- or abnormal functionings to such an extent as seriously to disturb the organism or even to threaten it with new trouble. When this is the case, legitimate indications for symptomatic treatment may appear, and we may have a just warrant for interfering with Nature; we may have to hold her hands when she is thrashing around too wildly in a desperate or futile fight. Also unusual functioning may be kept up so long as to threaten to become a habit or a truly functional disorder, and for that reason may be a legitimate object of symptomatic treatment. And some of the hypofunctionings may involve actual morbidity and require treatment to stimulate the functions to meet vital necessities of the body; as when cardiac contractions are too weak and vasomotor tone too lax to insure an adequate circulation. Pain is a symptom which frequently calls for treatment: the alarm clock may continue ringing too long, waking up the neighborhood, and require to be choked off.

High blood pressure does not often require direct treatment; occasionally, however, it does; as when its continuance at an exaggerated height threatens acute injury to the cardiovascular apparatus, or increase of damage which already has taken place; when cerebral hemorrhage has occurred in the presence of very high blood pressure arteriodilators may be indicated; and in certain conditions of aortic disease, and in some cases of angina pectoris temporary lowering of the blood pressure may be rational treatment.

Fever, being regularly curative, should be let alone in most cases, but hyperpyrexia, when its continuance threatens harm, distinctly calls for antipyretic treatment. It may be well here to emphasize the wrongfulness of routine reduction of fevers. I myself up to about five years ago was accustomed to give all my patients with typhoid fever sponge baths to reduce their temperature when it rose as high as 103°; since then, however, I have not done so, but only attempt to reduce the fever when distinct hyperpyrexia is present; and I have observed no bad effects from this conservative action, but rather the contrary.

Constipation is often a disease and a cause of disease, as well as a symptom. In connection with the treatment of constipation it may not be amiss to call attention to the fact that in the present practice of medicine, viewed at large, overcatharsis seems to prevail widely; and the second aphorism of Hippocrates, which says that artificial evacuations, if they consist of such matters as should be evacuated, are well borne and do good, but if not, the contrary. A wise European recently made the discovery that the national drug habit of America is the excessive use of cathartics. Certainly the routine use of cathartics, for the sake of catharsis, lacks justification. In some diseases, notably typhoid fever and pneumonia, constipation of moderate degree, provided certain precautions are taken in respect to the diet, seems to be beneficial rather than otherwise.

I would repeat that while symptomatic treatment has a large and important place in therapeutics, in order to be rational it must avoid interfering with Nature when she is doing her work well.

1218 PACIFIC STREET, BROOKLYN.

THE RELATION OF FRESH AIR AND HOUSING TO HEALTH.

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A great many of the interiors of homes are breeding places for disease, because of the difficulties in the way of admitting fresh air and by reason of the many objections to its free use.

It has been reported that tuberculosis is a disease which in the majority of cases occurs in houses of three rooms and under—the number of cases is larger in two roomed houses than in three, is larger in houses of one room than in two, also the number of cases of tuberculosis and pneumonia increases almost in direct proportion to the number of small overcrowded houses in any district or ward of a city. Today we recognize that fresh air is a remedy for pneumonia and tuberculosis, and may be considered preventive of disease generally. As it is thus essential for good health, it is necessary to make arrangements for obtaining it in every enclosed space used as a shelter by human beings. In all countries where winters are severe man's ideal shelter has been one that would ensure the best protection from the cold, but, unfortunately, this protection has been gained by excluding fresh air. The poor, in the attempt to prevent the waste of fuel, make their living rooms as near air tight as they can. In the North, fresh air is shut out in order to obtain a comfortable temperature. In the South, it is shut out to prevent malarial fevers. Millions of people in malarial countries believe that night air is the carrier of deadly disease, and they use every means to keep it out of their homes by closing windows and doors as soon as the sun disappears in the west. It is not uncommon to find whole communities closing their houses carefully at sundown and not opening them again until morning. This custom, naturally, should be abolished, for since the discovery that the mosquito is the carrier of tropical fever, and not the night air, one may breathe fresh night air with impunity if he protects himself from insects. Fresh, cold night air stimulates and tones up the body and induces healthy sleep, which is normally followed by renewed strength and a fresh outlook upon life.

Appreciating the value of fresh air, more attention should be paid to ventilation. The most scientific information on ventilation is that air, to be healthy, must be kept in motion and the humidity kept low. These two factors are more important than the proper proportion of oxygen and carbon dioxide. However, it is advocated that the human organism requires from eight hundred to a thousand cubic feet of fresh air per hour to keep it in efficient working order. A room twelve and a half by ten, by nine and a half, is a good sized room

for a slum quarter. Yet the number of cubic feet of air which it contains is less than twice the amount required for the health of the average person, even if there is not a stick of furniture on the floor. Add the ordinary amount of furniture, every piece, which subtracts cubic feet from the total space, and put four or five or more people in the room instead of two. How much chance does each have of getting the minimum amount of fresh air, even provided the air can be completely changed every hour? When the air is raw and too cold out of doors to permit the opening of windows with comfort, but not so cold as to necessitate the use of the furnace, a number of people will often gather in one room in order that the warmth of their bodies may produce a comfortable temperature. It is obvious that the atmosphere of rooms heated in this manner soon becomes foul and unhealthy. Lamps and gas burners also raise the temperature very rapidly, and one of these will remove about the same amount of oxygen from the air and produce as much heat as three or four persons. Heated air and gases from the lungs and bodies being warmer than the surrounding atmosphere, rise and are held in suspension below the ceiling in a closed room. This layer of foul air is more or less deep, and gradually fills the entire room. In such a room one becomes drowsy, yawns and complains of headache. Fresh air is as much an essential in the bedroom at night as during the day, and every one should sleep with windows wide open during all seasons of the year. A small aperture at the top and bottom of the window does not give a sufficient supply of pure air to the sleeper. Too much emphasis cannot be placed on this phase of the fresh air problem, because the habit of closing up sleeping rooms at night is prevalent throughout the entire country.

It is also important that infants as well as children receive as much fresh air as possible. In summer an infant may be allowed out of doors at the end of the first week of life. He should be kept in the open air as much as possible during the day. In the fall and spring this should not be permitted until the child is at least one month old, then only when the out of door temperature is above 60° F. During the outing the head should be protected from the wind, and the eyes from the sun. The duration of the outing should be from fifteen to twenty minutes, and the time gradually lengthened to two or three hours. The child should be gradually accustomed to change of temperature in the room by opening wide the windows for a few minutes each day even before it is taken out of doors, the child being dressed meanwhile as for an outing. When children are born late in the fall or winter this means of giving fresh air may be begun when one month old and followed throughout the first winter. Changes should be made gradually, both as to the length of airing and temperature.

It is a matter of very serious importance that every infant be furnished an abundance of fresh air in winter as well as in summer. When the plan above outlined is carefully and judiciously followed, the tendency to catarrhal affections, instead of being increased, is thereby greatly lessened. When four

or five months old there is no reason why a healthy child should not go out of doors on pleasant days if the air is not too cold. While there is a prejudice against a child sleeping out of doors in cold weather, it is a practice which is seldom followed by any but the most beneficial results. The days of all others when infants and very young children should not be out of doors are when there are high winds, especially those from the northeast, an atmosphere of melting snow, and during severe storms. It is important to remember that the nursery or child's room should be the best ventilated room in the house; it should have plenty of sunlight, and nothing should be allowed in it that contaminates the air. No drying of clothes or napkins; no food should stand about the room, and the gas should not be allowed to burn at night. In so many instances the room is kept too warm. Often no other explanation can be found for chronic indigestion and falling weight than this. The furniture of the nursery should be simple, the children should use separate beds if possible, and where a cradle is in use it should be of the sort that does not rock. It is important to remember that the position of the child should be changed from time to time. The violation of these simple rules of hygiene is at the bottom of many of the milder disorders and often of some of the more serious diseases seen in infancy.

It is essential that tuberculous patients should spend not merely a brief portion of the day out of doors, but should remain in the open air as many hours out of the entire twenty-four as weather conditions will permit. It is far from sufficient to advise the invalid to stay out of doors as much as possible. If left to the exercise of his own judgment and inclinations, the period of fresh air existence is lamentably short and usually accompanied by unfortunate indiscretions in the way of physical exertions. For consumptives to obtain fresh air at all hours and at the same time to remain completely at rest, frequently special provision must be made for this purpose. The requirements to be observed, first relate to devices for securing the maximum of fresh air with the invalid at rest within doors, and, second, the arrangement for the comfort and shelter of the patient if in the open air.

The window tent was originally devised in order to give the open air treatment to the tuberculous patients in their own home when they could not procure the use of porches, outdoor tents, or be treated in a sanatorium. As window tents have proven both convenient and economical, they are now used by many healthy persons who wish to sleep during the winter months without cooling off their houses. These tents are all constructed practically on the same principle, the difference between them being largely in the shape and manner of their manipulation. A frame, usually of steel, supports a canvas cover, and this canopy incloses a space inside the room connected with the window. The tent frame is either attached to the window casing or the head of the bed, and projects over the bed, covering the head and shoulders of the person lying on it. Another important phase of

this treatment is the arranging for the comfort and shelter of the patient. An essential feature is the adequate protection of the body despite low degrees of temperature. This is positively important in cases of low vitality. The desired effects of the fresh air treatment are to be obtained without chilling the body. Being adequately protected by good, warm clothing, the fresh air acts as a stimulus not only to the parts exposed, but other normal functions of the body are benefited. However, when the patient is very sick and his strength is at a low ebb, and he is unable to produce sufficient bodily heat to combat with the external conditions, it is unwise to keep the patient out of doors or at an open window or on a sleeping porch, unless in the latter instance heated air is being supplied. This is also true in the aged.

In addition to the protection of the body by means of proper clothing, it is important that various means of outside shelter be devised. During the summer, provision should be made in all cases for protection from the intense heat of the sun and the sudden showers, and also means afforded for the avoidance of nervous irritation and loss of sleep produced by the fly or mosquito. In winter, adequate shelter must be provided from chilling blasts and storms. Finally, it appears that if the poor are able to devise inexpensive means of adapting their homes to the "fresh air idea" surely the wealthy should provide every facility in the construction of porches, opening directly from the sleeping room upon the second floor. In fact, there are some sections of cities where this feature is the general rule. The porches should be covered by a permanent roof, sheathed from the bottom a distance of three feet, with a wide sill, and inclosed with wire screening or netting.

It is encouraging to note that the general public is beginning to realize the importance of fresh air, and many of the modern houses are being equipped with sleeping porches, while others utilize their balconies for that purpose, thus increasing their resistance and making them less susceptible to invasion by various pathological organisms.

The intimate association of the question of proper housing to the problem of fresh air is easily recognized. In the study of housing conditions in one of our large cities it was found that the infant mortality rate was 87.8 per thousand for the whole city. Of those that slept in rooms rated as well ventilated the rate was 28.1; of those who slept in rooms rated as poor the rate was 169.2; a difference of 141 per thousand. Sir Arthur Newsholme, the great English authority on public health, rightly says, "Infant mortality is the most sensitive index we possess of the sanitary condition of the home." The question of infant mortality at this period in our national life is a grave one. As Samuel McC. Hamill (1) says: "This country faces a serious situation. Its man power is threatened. Immigration has ceased and probably will never again be a very potent factor in the increase of our population. We have established literacy laws which in normal times would have caused a great decrease, but what is of much more significance, the loss of men in the countries which were once the source of our supply has

been so great that these countries are considering the advisability of placing a permanent embargo upon immigration, which will practically end this source of increase." Today we are handicapped by not having enough men to do the work in our industries. If men are to be killed in battle or maimed for life, if our birth rate decreases, and by any chance our infant death rate is permitted to increase, we will create conditions that will require generations to overcome. We readily recognize that the basis of all health work is education. Hamill reports that England was able to reduce her infant death rate from 110 per thousand living births to 91 in a single year by multiplying her educators. The government financed every private agency of standing and multiplied her health visitors—the women who go into the homes of the people to tell them how to care for their babies and children—so that she had one to every 500 children born. New Zealand attained her results by the education of all classes, especially of the mother in the home.

Disease causes absence from work, which means reduced earnings and increased expenses, and, in extreme cases, a state of mind which has been termed "slum disease" is developed, in which individuals have become chronically careless or indifferent because they have found themselves unable to cope effectively against the depressing influence of their surroundings. The serious effect of this attitude of mind upon industrial and commercial developments is obvious.

220 KELKER STREET.

REFERENCE.

1. SAMUEL McC. HAMILL: *The American Journal of the Medical Sciences*, 1918, civ, No. 1.

THE TREATMENT OF FLAT FOOT.

By F. RICHARD NEWMAN, M. D.,
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Flat foot, or pes planus (known also as splay foot, acquired, or spurious valgus), is a flattening of the arch usually with abduction and eversion of the foot. The causes include all those conditions which induce a disproportion between the weight of the body and the strength of the muscular and ligamentous tissue controlling the foot and diseases or injuries which alter the relation or shape of the bones, such as: Improperly fitting shoes, prolonged standing, rapid increase in weight, general ill health, prolonged disease of the foot, resulting in muscular weakness, infantile or other forms of paralysis, rickets, injury (particularly Pott's fracture) and arthritis of gonorrheal origin. Symptoms may be absent in a well marked case or severe in a case in which the deformity is slight or absent. Pain, particularly after using the foot, is most marked in the sole and midtarsal joint, but may occur in other portions of the foot, sometimes being reflected up the limb even to the lumbar region, occasionally associated with muscular spasms. Normal flexibility of the foot is lost; there is tenderness over the points of ligamentous attachments; the gait is shuffling, and some swelling may be present leading to an incorrect diagnosis of rheumatism. The deformity is obvious in well marked cases and is accentuated when the

patient stands. The inner border of the foot is lengthened and rests on the ground, the internal malleolus and head of the astragalus are unusually prominent, and plantar ligaments and muscles are stretched, the tibialis posticus weakened and the peronei contracted. (An impression of the weight bearing portion of the sole may be obtained by having the patient step on cardboard covered with lamp black.)

Treatment.—In static cases due to disproportionate weight is the application of a flat foot plate, massage and electricity to strengthen the muscles, and exercises, such as rising on the toes, walking with the foot in a varus position. When the symptoms have disappeared, the plate should be gradually discontinued. When the foot is too tender for the use of a plate, rest in bed with a plaster cast applied is beneficial. Where eversion is well marked, a steel bar running up the outer side of the leg and supplied with a strap which passes around the internal malleolus and pulls the ankle out should be applied. Plates and supports are useless unless the deformity can be corrected. If the foot is fixed in deformity an anesthetic may be given and the deformity overcorrected with the hands or the club foot wrench and a plaster cast applied, a support being used when the pain has disappeared. Paralytic cases are treated by transplantation of nerves. The peroneus brevis is passed under the tendon achillis and attached to the scaphoid and the peroneus tertius attached to the same point after being passed beneath the anterior tendons. The extensor longus pollicis or the tibialis anticus may be passed through a hole bored in the scaphoid and turned back and sutured to the periosteum. When the condition is osseous, a wedge of bone may be removed from the inner side of the tarsus. Osteotomy of the neck of the os calcis and astragalus, removal of the scaphoid, supramalleolar osteotomy, longitudinal section of the os calcis with displacement downward of the posterior fragment, all have been resorted to, with reports of success in several cases.

Bismuth Paste in War Surgery.—Emil G. Beck (*Annals of Surgery*, April, 1918) summarizes as follows regarding this paste: The methods of primary sterilization by means of flushings with hypertonic solutions should be thoroughly tested to determine their effectiveness without the additional use of pastes. The radical excision of infected tissues, as now practised in the war hospitals, should be adhered to, as a means of preventing chronic suppuration. In those cases in which early sterilization was not obtainable and the wounds persist in suppurating, the bismuth paste injection or similar formulæ should be employed before another radical operation was resorted to. Correct technic in employing the paste was essential if satisfactory results were to be obtained; it and similar formulæ were applicable in chronic suppurations resulting from war wounds, as well as in those due to chronic infectious diseases. In cases in which the bismuth paste treatment was not effective, the sutureless skin sliding operation should be employed, since with this method we were able to clear up nearly all of these apparently hopeless cases.

CHOOSING THE ANESTHETIST.

BY ISIDORE JOSEPHSON, M. D.,
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Ever since general anesthesia was first introduced into surgery the choice of an anesthetic was the field of experimentation and investigation. At the present day the value of each has been tested and proven, and the choice of one for a certain operation and patient is easily determined. The value of ether, chloroform, nitrous oxide, ethyl chloride, etc., as a general anesthetic has been fully determined and very little can be added in our present state of knowledge.

Choosing the anesthetist to decide whether it shall be the nurse or the intern, the experienced physician or the novice, is a matter still in the experimental stage.

A well known surgeon once said that if he were to be operated on his first question would be, "Who is going to be my anesthetist?" The apprehension which the layman experiences as regards his anesthetic is only too well known, and the majority fear this part of an operation more than the operation itself, the surgeon himself more than anyone else, appreciating the importance of the anesthetiser. In spite of this, this important task is often entrusted to some underling, who pursues his task unconscious of its importance, and it is surprising that so many surgeons tolerate this.

Anesthesia, as an art and science, is a comparatively new study and it is only within recent years that it has been elevated into the realm of specialties. Thus there are now specialists in anesthesia just the same as there are specialists in any other medical specialties. Numerous books have within recent years been written on the art and science of anesthesia, and the literature on the subject is voluminous—for the administration of the anesthetic is become more and more to be considered next to, if not of as equal importance, as the operation.

Now the practice of any specialty implies a preliminary thorough groundwork in general medicine. In spite of this fact the administration of an anesthetic is often entrusted to individuals who have never even seen the inside of a medical school, particularly the trained nurse, and working on the supposition that anesthesia is a specialty of medicine it is hard to understand why the trained nurse, after more or less instruction in anesthesia, should be permitted to practice this specialty. Surely no one would expect a trained nurse or any other non-medical individual to become a competent ophthalmologist or gynecologist or specialist in any other branch of medicine, no matter how extensive the period of training nor how competent the instructor. P. J. Flagg in his preface to *The Art of Anesthesia* says: "How can a lay person intelligently form an opinion upon such vital matters as acidosis, toxemia, carbon dioxide, stimulation and depression? How can he unravel and relieve the untoward symptoms which might arise in a case complicated by respiratory obstruction, morphine depression and reflex inhibition?" No one can deny that these factors must constantly be uppermost in the mind of the individual officiating at the head of the table if he is really in earnest about his work, but earnestness does not imply a medical education.

There is one other medical specialty practised extensively by nonmedical individuals, and which can be given here in comparison, namely, obstetrics. We all know of the havoc wrought by the midwife. The medical profession is beginning to realize the gravity of permitting poorly trained women to attend a woman in labor, a procedure that sometimes assumes the proportions of a major operation. Shall the science of anesthesia also be permitted to be practised by those who are not competent?

The fault, no doubt, lies in the fact that in both cases some degree of mechanical skill is involved, a skill easily acquired, but with forgetfulness at the same time that there are a great many fundamental principles of medicine and surgery at the bottom. An individual cannot be called an anesthetist when just able to guide a patient through an anesthetic by virtue of certain signs which he has been taught to recognize, any more than a woman who has been taught how to make a vaginal examination and can guide the head over the perineum without getting a tear, can be called an obstetrician.

The medical man to whom the ether cone is most often entrusted, is the hospital intern. The advantage in having the intern administer anesthetics is that he possesses a medical training. Still, there are some disadvantages unless his work is supervised by competent anesthetists. Most hospitals do have regularly appointed visiting anesthetists, for the purpose of acting as instructors to the interns, and the system would be ideal were the instructor always present on operating days. He very often fails to make his appearance and the intern is left to get along as best he can. I maintain that no intern should be permitted to administer an anesthetic without the presence of the visiting anesthetist. Since no house surgeon is permitted to perform an operation without the presence of the attending surgeon, no exception should be made as regards the anesthetist.

A surgeon who is constantly diverted from his task in worrying about the anesthetist, cannot give full measure of his skill to his patient, and without coordination between surgeon and anesthetist the patient is deprived of both their individual attention, the burden most often falling upon the ward patient. The average intern when left to his own resources, and after having overcome the first difficulties of his art, acquires a certain degree of contempt for this part of his training, whereas the more experienced and thoughtful man ever acquires a greater respect for his work. To quote Flagg again: "A thousand anesthetics instead of leading to crudeness should make one a thousand times more careful." The intern, however, considers this part of his training as something to be soon over, and it is a common thing to hear interns say, when speaking among themselves, that they are tired of "slinging dope." It takes a great deal of experience and practice to become an expert anesthetist. The intern changes his service every three or four months. Just about the time the surgeon is beginning to have confidence in one man, his service changes, and the surgeon finds a new one to cope with. Naturally every surgeon expects good work, and many surgeons are cranks on anesthesia, and properly so. The poor intern is, of course, crude in his work and is often the butt of the surgeon's remarks. The latter for-

gets that the intern is placed in a peculiar position, namely, that of a novice endeavoring to do the work of an expert.

My chief argument is in behalf of the general ward patient, who is the usual one to suffer. The private patient can choose his own anesthetist. The surgeon usually sees to it that only an experienced man will act in this capacity for his private cases, for it is a great source of comfort to him. But the patient in the general hospital ward has no choice in either operator or anesthetist. As far as the surgeon is concerned no patient need fear, for most surgeons on the attending staffs of our free hospitals are appointed only after demonstrating their worth. The same should apply to the anesthetist. Nurses as anesthetists should be entirely eliminated. An intern should act in this capacity as part of his training only in the presence of and under direct supervision of the attending anesthetist. In this way the surgeon's peace of mind would be preserved, the operation pursued with greater despatch, and the patient's welfare thereby safeguarded.

789 DAWSON STREET.

GALLSTONES.

History, Diagnosis, and Medical Treatment.

BY SAMUEL WEISS, M. D.,

New York.

(Continued from page 936.)

AMNESIS AND EXAMINATION.

As a rule, the medical profession is content with the general diagnosis of gallstones, without determining their manifold expressions, the degree of inflammation, and the location of the stones. Whoever wishes to review and recognize a disease must first of all apply himself to the study of its pathological anatomy with all the means at his command. Unfortunately for the practitioner of internal medicine, the study of these processes as they develop in gallstone diseases is extraordinarily impeded, since he is for the most part thrown upon his observations at the bedside and the autopsy table. This is the reason why the majority of doctors fail to recognize all the changes which gallstones produce in the living, and since they are not master of the pathology or pathological anatomy of cholelithiasis, its special diagnosis remains for them an unsolved riddle. The pathological anatomy of cholelithiasis forms the foundation for its special diagnosis and treatment, and without its exact understanding we can neither frame good diagnoses nor initiate a rational treatment.

The fact that anger or an error in diet can excite an attack of colic is not to be ignored. Patients with a general enteroptosis, especially with prolapse of the liver, may have pains which one can well explain by an atony of the gallbladder. Large and lax, with thin walls, the organ lies there in the belly, without a stone, inflammation, or adhesion to be found. The muscular structure of the gallbladder is so weakened that it cannot expel the bile collecting in it; this bile is dammed back, distends the walls of the gallbladder, and thus excites

colicky pains. What can this fearful pain in the region of the stomach suggest? It might be an innocent gastralgia or the approaching perforation by an ulcer of the stomach, a serous cholecystitis or a severe form of purulent inflammation which, indeed, after a few days, might lead to death. Even the busiest practitioner makes the attempt to investigate thoroughly the cause of the pain. It is not always possible to take the previous history of the disease with this exactness; the patient has long forgotten when his disease began, and the stomach cramps may not be connected with the picture of gallstone disease. Most patients have at some time been jaundiced, before they permit themselves to become convinced that they are suffering from gallstones. Furthermore, the taking of the previous history is greatly impeded by the extreme suffering of the patient and his disinclination to respond to the cross questioning of the physician. He asks nothing more than release from his torture. In most cases for the moment it is a matter of indifference whether we have to deal with an attack of gallstone colic or a stomach cramp; the treatment is much the same; yet it is of great consequence that we should immediately make a correct diagnosis. It is a grievous wrong for the physician to seek to calm the patient and his relatives by lightly throwing out the remark, "It is only a cramp of the stomach!" If he takes a few minutes with a few questions concerning the previous course of the disease, to investigate well the kind of pain, then it will become clear that it is a case of gallstone colic. The following are important points in the taking of the amnesia.

Age and sex.—Gallstones are very rare in the first twenty years and then increase in frequency. That the female is more disposed to cholelithiasis than the male is a fact from the nearer investigation of which I refrain.

Disease of parents, brothers, and sisters.—In many families, cholelithiasis is very much at home. Often the patient states that her mother suffered from gallstones, her father died of cancer of the gallbladder, and a brother or a sister suffer with their stomachs. With the enormous frequency of gallstones, I do not lay the great stress which Riedel does upon the heredity of cholelithiasis, but when I diagnose gallstones in people whose parents have died from cancer of different organs, then I feel it my duty to warn them of the fact that in fourteen per cent. of all gallstone cases cancer of the gallbladder develops, and that the operation is indicated more clearly in them than in others.

Previous disease of the patient.—The children's diseases play no part here. With sure proof of lues and articular rheumatism, an operation is to be seriously considered. Frequently, it may be found that the first symptoms of cholelithiasis appeared after typhoid or gastroduodenal catarrh with jaundice. In many amneses, we hear of appendicular inflammations, rightsided movable kidney, or ulcers of the stomach; I have frequently been able to establish that not a trace of the three diseases was to be found. The right kidney was immovable and was not dislocated; the appendix was not sensitive; there was no trace of ulcer in the stomach.

Kind of pain.—The character of the pain, its localization, its appearance, and its dependence upon meals must be carefully examined by us in order to find the diagnostic points which differentiate the pain of ulcer from gallstone colic. Its differentiation is important. Here may we only hint that gallstone colic pains are frequently dependent upon the beginning of menstruation or of pregnancy, and it has long been known to the gynecologist that in connection with operations which he performs upon the uterus and its appendages, attacks of gallstone colic occur not infrequently. Sudden changes in the relation of the circulation of the abdomen seem to play an important rôle in the transition of cholelithiasis from the quiescent to the active stage. The same is true of trauma. Of course, external injuries produce no formation of gallstones, but concretions resting quietly can be set in motion by the inflammation which trauma sets up. The physician ought to know this, since he may come into a position where he will have to explain this to accident insurance companies.

Jaundice.—Although jaundice occurs in gallstone disease relatively seldom, not at all as frequently as it has been assumed heretofore, yet it forms in the amnesia an important factor. "Have you ever had jaundice?" This question we must always ask, and we learn then whether it appeared immediately with the first cramp attack or later, how long it continued, what intensity it assumed, whether it remained the same or changed. At this time we inquire as to the condition of the stools, whether they change their color or remain uniformly free from color.

Fever.—This is observed in all possible symptoms of cholelithiasis, but it is especially characteristic in choledochus obstruction by reason of its intermittent form. We inquire as to the height of the fever and its duration, and are frequently able to determine the extent of the inflammatory progress which the gallstones have excited by attention to the relations of the fever.

Relation of the stomach.—Frequently as the stomach is disturbed in its function during the attacks of colic, so often can it in the interval be perfectly healthy. The patient may digest the most exceptional tidbits, but usually suffers from eructations, distention, and nausea. If vomiting is present, we find out whether, for example, the vomitus was mixed with blood; whether at any time a stone was vomited. The fact that cholelithiasis is not rarely complicated with carcinoma and ulcer ventriculi indicates the importance of attention to the condition of the stomach in taking the anamnesis.

Condition of the intestine. Many gallstone patients are treated for intestinal troubles for years since the colics occur more rarely as the bowels become regular. One often hears, "If the wind passes freely, then I always feel well," and many have rid themselves of attacks of gallstone colic by using enemas. The occurrence of stones in the feces is the best indication of the presence of cholelithiasis. The complaint of diarrhea alternating with constipation is heard frequently in the

amnesia. I believe that this change in consistence in the feces is to be ascribed to adhesions between the gallbladder and intestine.

Body weight.—During the colic, the patient shows no inclination to take food or drink; he loses weight and quickly recovers it if the gallstone disease remains localized in the gallbladder and the inflammatory processes abate. With frequent recurrences the organism is not in condition to regain the former weight and emaciation makes still greater progress if the stomach is involved in the complication and jaundice appears. In its chronic form without cancer, cachexia may develop which reminds one of the cancerous cachexia. The general condition of many patients will be absolutely unchanged by gallstone suffering; they look sun-browned and weather seasoned and many a corpulent woman with a good layer of fat in her abdominal walls does not look as if she almost weekly suffered from colic with violent vomiting.

Nervous symptoms.—It is not remarkable that the gallstone patient through constant pains so suffers in his nerves that the slightest excitement drives the bile into his blood; it is well known that anger is the worst poison for men who suffer with their liver and from gallstones.

In obtaining the previous history, proceed with the greatest care. The examination which follows the amnesia will thereby be greatly simplified. It is selfevident that the examination should have regard not only to the field of the disease, the liver and gallbladder, but the entire body. Every organ of the body should be examined. If we are called to the patient's house, we usually find him in bed; if he comes between attacks to the physician's office, he should be placed upon the examination table. The physician places himself on the right side of the patient and turns his face to him. Good light should be provided. Before beginning the special examination of the diseased organ, we ascertain the condition of the heart and lungs and the quality of the pulse, and take the temperature. If necessary, we examine the rectum and vagina and determine the motor power of the stomach by trial breakfast and the chemistry of the stomach's digestion.

The urine should be examined for albumin, sugar, and bile coloring matter and the stools should be carefully inspected. Bile coloring matter is always found where jaundice exists; albumin is met with in the disease of the bile ducts attended with fever; sugar appears now and then. The regular search of the feces for stones is not always possible and practicable. One cannot expect the physician who has many gallstones cases under treatment, to spend his time armed with sieve and stick in stool analysis. The soft masses crumble simply in the intestine and dissolve. I give my patients the following advice: "Observe carefully the color of the stools; as long as they are putty-colored, they need not be examined closely; so soon as the brown color returns then it is necessary, if one wishes to run down the stone."

The general examination of gallstone patients is under no circumstances to be neglected. The special examination begins with inspection. An ex-

perienced diagnostician will be able to make the diagnosis at first glance from the existence of jaundice, the expression of the face, and the presence of cachexia. Of course, a carcinoma patient is usually a greater sufferer than one with choledochus obstruction; but the latter may also so fail that he looks like a cancer patient, especially, if fever comes on and the infection advances. The patient produces then an impression of extraordinary suffering. We should not rely too much, however, on inspection, since patients might thus be left unoperated who had decided cancerous cachexia and in whom by an operation perfect health could be reestablished. I recall several cases from my practice in which the physicians previously treating them had positively diagnosed a cancerous affection, while there were gallstones only.

Turning the attention to the right hypochondrium and requesting the patient to breathe deeply, the liver will be seen to move before our eyes following the respiratory movement of the diaphragm. The hydrops of the gallbladder or the organ distended with an empyema often appears as a globular tumor. It also ascends and descends with the respiration, unless fixed by adhesions. We notice in acute cholecystitis, the prominence of the right hypochondrium and the pit of the stomach, which indicates inflammatory processes going on there. If the gallbladder is visible as a tumor and marked jaundice exists, there is almost always a tumor on the choledochus which compresses this duct. Carrying inspection further, we examine the relation of the stomach, whose pylorus may be adherent to the gallbladder by inflammatory processes. Even without filling it with air, it will be clear that it is dilated; following the peristalsis of the bowels, it will not merely cease in the region of the gallbladder but become reversed. From this we assume adhesive and inflammatory processes in the gallbladder.

In gallstone disease, palpation is most important. It is difficult to learn palpation from a description. Many a doctor with extensive practice and experience never learns it, since lightness of hand is wanting in him. The art and manner of examination is frequently not properly pursued, and for this reason, I allow myself some remarks in regard to this. The patient on his back draws his knees up and opens his mouth while he breathes quietly. The examining hand should be warm and it is wrong to rush immediately to the seat of the disease; first, examine the parts of the abdomen which are apparently free from pain and then gradually approach the seat of the pain. Finding the region of the gallbladder sensitive, inquire as to the kind and intensity of the pain, and then determine how extensive the painful region is and whether the sensitiveness is solely localized in the region of the gallbladder. This manner of examination suffices only for a few cases, as, for instance, when large tumors of the gallbladder, are concerned or when the peritoneum participates in the inflammatory process. By the bimanual examination, we attain far better results. The doctor lays the left palm on the right side of the patient's back and presses carefully but strongly on the liver from behind upward against

the curvature of the ribs, while the right hand, lying on the gallbladder region, palpates gently and cautiously the diseased parts. The eggshaped figure of the gallbladder, then frequently appears, or one feels that limited resistance which is so important in making the diagnosis. Only in cases of excessive tenderness does the patient so contract his abdominal muscles that all endeavors to attain our end by palpation are in vain. Also if the gallbladder lies concealed high up under the liver, it will elude the examining finger, although it is distended with inflammatory or purulent exudate. These are the cases which the physician ought to recognize thoroughly, since a suppurative inflammation can quite well exist in a gallbladder inaccessible to palpation while jaundice, enlargement of the liver, and fever are completely wanting. In these cases the bimanual procedure is often decisive, since one with the frequent use of the same, can always again prove a painfulness concentrated at a particular point. Palpation of the gallbladder is followed by palpation of the liver. Palpate the lower liver border to discover whether it is sharp or rounded and glide gently with the finger over its smooth or uneven upper surface. One part of the liver which enlarges frequently in cholecystitis is the part overlying the gallbladder, which grows downward into a tongue-like process and can easily cause confusion with rightsided movable kidney. With cholangitis and chronic choledochus obstruction, the liver is markedly enlarged; in chronic obstruction of the common duct by a stone, one seeks usually in vain for the gallbladder, while in obstruction of the common duct by a tumor, it is clearly to be palpated. If we can palpate the liver, it does not mean that it is enlarged or diseased. Women who suffer from enteroptosis exhibit livers the lower borders of which far surpass the normal boundaries. By lacing, the form of the liver can be changed in such a way that the largest part of the right lobe may extend far down deep in the abdominal cavity.

Percussion is necessary to prove these conditions. In diseases of the liver, percussion gives valuable information. We determine the upper and lower boundaries of the liver dullness and thus obtain a picture of the size of the organ. One should assume that the region over the palpable gallbladder is dull and that the dullness of the gallbladder passes directly over to that of the liver. By auscultation we attain little in cholelithiasis. At all events, I trust more to palpation, less to percussion, and least of all to auscultation. One method of examination I do not employ is diagnostic exploratory puncture. It is of no value and may cause injury. Attention to the previous course of the disease, exact examination, test of the motor and chemical functions of the stomach and of the stools, etc., will clear up the results of palpation and will frequently suffice to indicate a correct diagnosis.

Until recently the Röntgen rays have rarely demonstrated gallstones successfully, but today this means is extended to the special diagnosis of gallstones. Whereas formerly, it was available in two per cent. of the cases examined, today it is available almost in fifty per cent. Very lately the diagnosis

of cholelithiasis has been made through finding increase in the cholesterin in the blood.

CLINICAL PICTURE.

Gallstones are often present in the gallbladder without giving rise to any symptoms. Kehr (3) states that the symptoms occur in only five per cent. of persons whose gallbladders contain calculi.

Onset.—The extremely violent pain of biliary colic may come on suddenly or may be preceded by shivering, nausea, and vomiting. It was formerly thought that contractions of the gallbladder were set up reflexly by the passage of food into the duodenum and that three to four hours after ingestion of food was the most probable time for the onset of the colic, but now it is known that biliary colic more commonly commences at night. The onset of the menstrual period was believed to aggravate an attack of biliary colic by inducing nervous disturbance and general engorgement of the abdominal viscera (4). During pregnancy and lactation, biliary colic is infrequent or absent, but after weaning, severe attacks may occur. In my own cases, I have found that pregnancy favors the development of gallstones and Naunyn (5) estimates that ninety per cent. of women with cholelithiasis had borne children. Attacks of pain of less severity may be due to spasm set up by a stone in the gallbladder, which has not actually entered the cystic duct. Inspissated bile and precipitated masses of cholesterin and bile pigments in the ducts, may also induce modified attacks of biliary colic. Inflammation and spasm extending to the ducts from cholecystitis must also be reckoned with as a cause of biliary colic. In other words, biliary colic may, like the pain of appendicitis, be independent of calculi. Cholecystitis with closure of the cystic duct from any cause will give rise to painful contractions of the gallbladder; in many cases the factor responsible for closure of the cystic duct is a calculus.

It is, therefore, clear that some conditions other than those of ordinary life must be responsible for the passage of calculi into the cystic duct, and that something more is required than the ordinary muscular contractions of the gallbladder which suffice to drive out the bile. Vigorous contractions of the gallbladder, such as might be induced by violent emotion, may determine the passage of gallstones into the cystic duct. Occasionally, jolting, such as riding in a cart without springs, a railway journey, or riding a bicycle, has been thought to cause calculi to pass into the cystic duct. Clinical palpation of the gallbladder, is sometimes followed by colic. Traumatism, such as a fall or blow, may cause colic. Acute cholecystitis following diarrhea, typhoid fever, or influenza, may be the antecedent condition to an attack of biliary colic.

Signs and symptoms.—The pain in biliary colic is due to two factors. There is probably nearly always acute inflammation of the gallbladder which precedes and may be the determining factor in the expulsion of calculi into the cystic duct. The pain of acute cholecystitis is felt in the right hypochondrium and epigastrium and when the calculi pass into the cystic duct, severe muscular spasm is set up which manifests itself by pain in the right

loin and back. The pain may radiate in any direction, especially to the right shoulder, but this is less frequent in biliary colic than in hepatic abscess. That it does occasionally attack the right shoulder and elsewhere I have no reason to doubt, but cannot remember that I have ever heard a patient complain of its having radiated to the thigh or to the tips of the fingers. The point which I wish to emphasize is that when biliary colic is due to the passage of gallstones, the pain begins in the back and not, as in the other affections of the gallbladder and ducts, in the right hypochondrium. Doctor Kraus, of Carlsbad, who has had large experience in the treatment of gallstones and who himself suffered from the disease, insists on this point. Doubtless, however, so great is the influence of phrases recurring in our textbooks, the pain in biliary colic will still continue to be looked for only in the region of the gallbladder, and the first stages of the disease when treatment is of so much importance, will be overlooked or mistaken. I have known several patients treated for some months by physicians for pain in the back, whose acute sufferings from gallstones a few months later an earlier diagnosis would probably have done much to prevent.

When biliary colic is due to a stone entering or traversing narrow ducts, the pain begins suddenly. The patient may be sleeping soundly, laughing or talking and, in less than two minutes he is groaning in agony. The greater number of these attacks begin in the night. Kraus found in the course of one year's practice, that he was called sixteen times in the day, and sixty-two times in the night to relieve patients suffering from acute biliary colic. As already stated, we attribute the prevalence during the night to the fact that the gallbladder becomes distended with bile when there is a long interval between meals. The attack may last only a few minutes and terminate in profuse vomiting. Unhappily, this is rarely the case. With occasional slight intervals due to the entrance of a stone into the wider part of the ducts, the attacks generally last from four to twelve hours. Some speak of pain of this kind continuing for days. I am rather inclined to believe that the pain continuing for days is due to an inflamed or distended gallbladder and not to the passage of stones. When a stone becomes impacted in the ducts, and jaundice supervenes, there are aches and pains of a somewhat dragging character, but there is not often a continuance of the acute agony which is experienced during its direct passage.

It is by no means easy to describe the pain of an acute attack of biliary colic due to the passage of a gallstone. Of all the pains, which mortal man can suffer, this is probably the most severe; women who have borne children have told me that the pain of childbirth is by no means so severe as that of gallstones. A few cases have been reported where death could be attributed to nothing else than the severity of the pain. There is the pain arising from a local peritonitis associated with an inflamed or distended and contracting gallbladder. The pain of acute biliary colic due to the passage of gallstones begins, as we have said, in the back. It begins suddenly and there is a moment when it as suddenly ceases, and

the patient who has been suffering in agony, looks up and says, "I'm all right." Pain arising from an inflamed or distended gallbladder rarely begins in the back, nor is its beginning or ending comprised in a moment of time. It is generally felt in the region of the gallbladder and is seldom so severe as that caused by the passage of a stone. In the early stages of gallstones, these two kinds of pain and their cause may be readily distinguished. In later stages when the gallbladder may be distended or its contents purulent and a stone at the same time is passing the ducts, there may be, as probably there is often, confusion.

There is a third type of pain differing entirely in position, duration, and cause from those we have just mentioned. It has often puzzled me and probably others who were unable to account for a pain in the left hypochondrium below the cartilage of the eighth, ninth, and tenth rib, and have referred to it in some vague way as some disorder of the stomach. To Mayo-Robson we are chiefly indebted for pointing out and insisting on the origin of this pain. I have gone into the history of a considerable number who have pain and tenderness in that position and have always found that some months or years previous to their having experienced this pain, they have suffered from attacks of biliary colic and generally there has been an unmistakable history of gallstones. This pain is doubtless due, as surgeons have found out, to adhesions in the neighborhood of the gallbladder. If the adhesions are comparatively recent and sometimes even years after an attack of biliary colic, pressure over the left hypochondrium will elicit pain in the region of the gallbladder.

Tenderness.—Not only during the attacks of biliary colic, but in the interval between attacks, tenderness is a well marked and important symptom of gallstones. Though this tenderness is more or less widely diffused, its centre is always below the ninth costal cartilage, or to put it precisely, according to Dr. Robert Abrahams in the centre of a line between the costal cartilage of the ninth rib and the umbilicus. Apart from the passage of stones or unmistakable distention of the gallbladder, there is no symptom that points more clearly to some affection of the gallbladder or bile ducts than tenderness at this point. I do not say that this tenderness is never found apart from gallstones or an inflamed gallbladder. I have observed it in mild catarrh of the bile ducts, probably causing such obstruction as to induce stronger contractions of the gallbladder. There need be, however, not the slightest hesitation in attributing it to stones or an inflamed gallbladder.

Evacuation of biliary calculi.—There can, of course, be no more certain proof of the existence of stones than their being found in the stools. The addition of eucalyptus or carbolic acid makes the search less disagreeable, and a few ounces of formalin in a one or two per cent. solution render the stools practically odorless. Pips or skins of fruit, husks of oats, bits of fat, or soapy materials are readily mistaken for gallstones, and the stones, being of varied size, color, and consistence, can readily be overlooked. A failure to find them after an attack of colic by no means proves that they have not passed through the ducts, as sometimes they remain for weeks or even months in the intestines.

Jaundice.—There is an impression, even among medical men, that when there is no jaundice, there can be no gallstones. It is true that in almost all who suffer from gallstones, a slight yellowness of the conjunctiva may be observed, but there is by no means always a well marked jaundice. When there is no obstruction nor pressure on the common duct, there is not necessarily jaundice and even when there are stones impacted in the common ducts, they may be of so irregular shape as to allow the passage of bile. In the diagnosis of gallstones, jaundice as a symptom is always valueless. In the vast majority of cases, their existence ought to be diagnosed long before the advent of jaundice. Further, jaundice arises from so many different causes inside and outside of the liver, that many diseases must be excluded before we can say, apart from other symptoms, that the jaundice is caused by stones.

Fever.—It is often said that the passage of stones is accompanied by fever. I have not found this to be the case, nor do I know any reason why there should be, unless increased temperature should be due to an associated inflammation of the gallbladder or bile ducts. There may be and often is shivering, but I have not observed high temperature. When, however, a stone remains impacted in the ducts, a considerable time there is almost always a rise of temperature.

Vomiting may be frequent during attacks of biliary colic.

Disordered appetite, as a rule, is not frequent, unless the patient is worn out with pain or sleeplessness.

General bodily condition.—When the attacks are frequent, there is generally, but not always, loss of flesh, and especially when there has been prolonged jaundice, the patient may be emaciated. The loss of flesh may be due to the pain and nervous depression, partly also to interference with meals, but apart from jaundice or high temperature I do not think it otherwise results directly from gallstones.

(To be continued.)

Longitudinal Sinus Transfusion.—Earl Mendum Tarr (*Northwest Medicine*, February, 1918) draws upon a personal experience of 507 punctures of the longitudinal sinus in infants, for securing blood for examination, for intravenous medication, or for transfusion. The technic of entering the sinus is simple, and the procedure is absolutely safe under ordinary precautions. For injection into the sinus a twenty milligram Luer syringe is connected with a moderately heavy hypodermic needle by means of two pieces of rubber tubing, four and one half inches long, separated by a two inch glass window. After cleansing the scalp, the needle is inserted through the posterior part of the anterior fontanelle in the middle line, and suction is made to withdraw a little blood so as to be certain that the sinus has been entered. The solution to be given is then injected slowly. Glucose, alkaline and other solutions, salvarsan and neosalvarsan, and blood have all been given in this way with ease and without harm to the patient. The sinus can be punctured repeatedly in the same patient without fear of damage.

Medicine and Surgery in the Army and Navy

ASCENDING OSTEOMYELITIS IN AMPUTATION STUMPS WITH PARTICULAR REFERENCE TO THE THIGH.

By A. MARCHAND, M. D.,
Lyons, France.

Having had recently under observation in the service of Professor Villas, two cases of ascending osteomyelitis in amputation stump of the thigh, it occurred to me that a few notes would not be out of place in relation to the surgery of warfare. The second case was particularly interesting. The patient, age twenty-six, was wounded on March 7, 1916, and was admitted to hospital on April 7th. There was a suppurating osteomyelitis of the remaining femur after amputation of the thigh at the lower third and the interesting point was that of a suppurating arthritis of the hip, due to pus coming from small intradiaphysary abscesses located in the articular portion of the femoral diaphysis. The arthritis of the hip was only discovered at autopsy.

The great military surgeons of bygone days, Roux, Paré, Reynaud, have given masterly descriptions of this pathologic process. Today the pathogenesis of osteomyelitis seems to us a simple matter; it is due to infection of the bone marrow by the bacteria of suppuration.

After an amputation on a subject already seriously ill, about to enter upon a septicemia, perhaps in tissues far from healthy on account of the extension of purulent tracts in a suppurating stump, infection of the osseous tissue must seem almost a certainty, and it is curious that in war surgery this lesion is not more frequently encountered after amputation.

Osteomyelitis in a stump occurs under several clinical types. There are benign limited types, usually resulting in recovery, and graver forms involving the entire bone, usually ending in death.

In simple osteomyelitis ending resolution, the inflammation of the bone marrow is made evident by changes in the medullary granulation. This, in the normal state, offers a rosy hue, projecting slightly, increasing considerably in size and at length spreads out in a kind of mushroom shaped production. It is dark violet in color, turgescient, and secretes a thick, dirty bloody liquid.

Histologically, the bone involved presents a rarefying osteitis or a condensing osteitis, while not uncommonly the two processes coexist.

The end of the divided bone in the stump may assume the most peculiar shapes. Sometimes it is pointed like an arrow, or the sharp edges become rounded and the end of the bone takes on the shape of a club or drumstick.

Osteomyelitis with necrosis is another process met with. During the early stages the same phenomena arising in the medullary buds are the same as in the former process. At the same time the wound changes in aspect, the granulations are pale, suppuration profuse, and the process of repair ceases. The temperature chart shows great oscilla-

tions, and the general condition of the patient is bad. The stump is painful.

If the stump is undergoing cicatrization, it suddenly becomes swollen, painful, and suppuration increases. In these circumstances it may be difficult to determine whether the case is one of osteitis or inflammation of the soft structures. Attention should be particularly directed to the fact that *deep palpation is painful*. Pressure on and percussion over the femur causes pain. Briefly, there is pain in the bone and this symptom should invariably be looked for. Usually, a series of abscesses form and purulent tracts between the muscles are absent. But at length sequestra will be found in the pus which are eliminated spontaneously or direct exploration reveals a characteristic rough denuded bone. This type may undergo an evolution to spontaneous recovery, but only after a long period of suppuration, and in most instances it will be necessary to remove the sequestra surgically.

The sequestra especially involve a portion of the remaining diaphysis and are annular in shape. When the sequestra have been eliminated, either spontaneously or by operation, the suppuration ceases quite rapidly and recovery ensues.

The third type is ascending osteomyelitis with necrosis. In one case under my observation the symptoms were the same as in the type just described and it was hoped that after removal of the annular sequestrum recovery would take place, but such was not the case. After a temporary improvement, the general symptoms indicated an extension of the process of osteitis and a week after the surgical removal of the sequestrum, more were eliminated. Death took place three months after amputation, there was no tendency to limitation of the infection, but on the contrary, there was a progressive invasion of the bone. The gravity of the general symptoms led me to conclude that the case was one of severe infection, and the intensity of the pain in the stump was great. The chronic progress of this case is to be noted. The amputation at the knee was done on September 3d, death occurred on November 30th. Cardot has pointed out that this form of the process never has an evolution of less than one month.

The fourth type is suppurating osteomyelitis. It is always acute, its duration short, usually less than one month. The process has not the time to end in necrosis and at autopsy purulent foci are found under the periosteum, in the bone marrow and osseous tissue. My second case was of this type.

From a clinical viewpoint, the general symptoms should be studied separately from the local ones which are pathognomonic of the process, the former being those of any severe general infection. It begins from ten to twelve days after amputation, and, as said, the general symptoms are those of septicemia in this case having an osseous origin. Such may lead to pyemia.

In my case, the patient showed a collection in the right thigh which was unquestionably metastatic, because it had no connections whatever with a

wound. The temperature varied greatly: there was profuse sweating and an occasional chill. Pulse from 120 to 140. The patient was restless and, occasionally, delirious. Then diarrhea set in along an albuminuria, indicating the action of the infection on the viscera.

The local phenomena in this type of amputation osteomyelitis are pain, and the appearance of abscesses of osseous origin. The pain is both spontaneous and produced by pressure. The spontaneous pain appears early, is intense, continued, and prevents sleep. The slightest movement of the stump causes intense agony.

Examination will indicate the seat of pain. Palpation shows that it is in the bone, while distant percussion likewise produces pain. Then suppuration invades the soft structures and the stump becomes tumefied. Careful exploration of the amputation wound shows that there is no pus in the muscular interstices until the day comes when fluctuation becomes manifest at some point. An incision is made, and then a deep seated abscess in contact with the bone is discovered. In my case, autopsy revealed a suppurating arthritis of the hip joint. It had not given rise to any clinical sign during life and was, therefore, not diagnosed.

The diagnosis of involvement of the hip joint in these cases must of necessity be a very delicate matter. Limited movement and pain in the joint are not sufficient evidence *per se*, so that the symptoms are attributed to the lesions of the soft structures.

During an interference one may come upon an open joint containing a purulent fluid and then resection is done, so it is important to bear in mind the hip joint in cases of osteomyelitis in the stump of a thigh amputation, particularly in the ascending type of this process which involves the totality of the remaining femur. In these circumstances, arthritis of the hip is practically sure to ensue on account of the intra-articular arrangement of the upper end of the femoral diaphysis. All cases of suppurating osteomyelitis so far published, have ended fatally if the process is allowed to continue without surgical interference. The problem of diagnosis offers itself in several aspects. It is not devoid of interest because, according to the solution given, one decides either for noninterference or operation.

In osteomyelitis with necrosis, the persistent high temperature, the profuse suppuration, the formation of abscesses followed by fistulae, naturally lead to careful exploration of the parts if this is not rendered unnecessary by the spontaneous issue of sequestra. The characteristic denudation of the bone will be found.

It is most important to decide if the case is of the limited or ascending variety. At operation, this will be discovered by the condition offered by the bone, but frequently there may be an extension of the osteomyelitis in a bone that appeared to be healthy. This will be recognized by the persistence of the symptoms and the elimination of sequestra which drew attention to the advisability of renewed surgical interference.

As I have pointed out, suppurating osteomyelitis is a true septicemia so that its presence should always be looked for in cases of amputation when a

serious general feverishness continues, without discovering abscess formation, purulent tracts or some visceral process which can account for the symptomatology.

Of course I do not refer to these cases where the patient dies a few days after amputation from a preexisting infection. In osteomyelitic cases the evolution of the process is slower, the pain and general symptoms appear ten days or a fortnight after the amputation in a subject who appeared to be doing well. The location of pain in the bone, a symptom that should always be systematically looked for, will affirm the diagnosis.

In other cases the appearance of an abscess makes diagnosis easier. In a patient whose condition becomes serious after a temporary improvement following amputation, a fluctuating tumefaction in the stump is discovered. This abscess, incised and drained, will be found connected with the bone. The topography of these abscesses is somewhat special and very important for the diagnosis.

When the suppurative process is in the soft structures of the stump, the site of the abscess is less deep seated; the condition is, in reality, purulent intermuscular tracts, usually communicating with the amputation wound.

Suppurating osteomyelitis should always lead the surgeon to fear an ascending type of the process. After amputation at the thigh, when the entire femoral diaphysis is involved, infection of the hip joint becomes inevitable. The symptoms of arthritis, in these circumstances, are indefinite and difficult to interpret. It is, nevertheless, not without practical interest to detect and carefully analyze the various symptoms which will result in making a diagnosis of the clinical type of the osteomyelitis and its complications.

THE REHABILITATION OF DISABLED SOLDIERS IN NEW ZEALAND.

By DOUGLAS C. MCMURTRIE,
New York,

Director, Red Cross Institute for Crippled and Disabled Men;
President, Federation of Associations for Cripples.

There are two principal military hospitals for the treatment of New Zealand soldiers, one in the North Island at Rotorua and the other in the South Island at Hanmer. It was decided to locate our principal military hospitals at the places mentioned owing to the fact that both Rotorua and Hanmer, especially the former, are centres of the hot springs districts so that the soldiers, in addition to getting the ordinary hospital care, can also receive the benefits of thermal treatment. This decision has been amply justified and results have exceeded all expectations. In addition to this treatment, which of course includes massage, high frequency electricity, etc., there is also that known as a mechanotherapy on the lines of that which I believe was first initiated by Doctor Tinel, of Paris, and subsequently ardently taken up by the British medical authorities. To make the treatment as efficacious as possible the Government has imported a great deal of apparatus which is, of course, supplemented as recommended by the medical officers in charge.

The King George V. Hospital at Rotorua special-

izes in the treatment of injured nerves, stiff joints, paralyses, etc. The Queen Mary Hospital at Hammer specializes in shell shock and neurasthenic cases, the climate and surroundings in the latter place being more particularly adapted for the treatment of those diseases. Doctor Herbert, at Rotorua, has done excellent work with regard to the re-education of soldiers, but of course there is a great deal yet to be done. At both the institutions soldiers have received instruction in some of the minor industries, but considerable extension of this work is needed and will undoubtedly be put into operation very soon.

It has been the practice of the Government to supply free of cost to each amputated soldier an artificial limb and duplicate. There has been started in Wellington an artificial limb bureau, the employees in which are men who, having lost limbs in service, were specially selected for instruction in the school for the manufacture of artificial limbs at Roehampton near London. These men are doing very good work, and it will soon be possible to meet all the requirements of New Zealand soldiers as regards artificial limbs. This department is, of course, in close touch with the Discharged Soldiers' Information Department and passes on to that department all men who are fit to undertake any occupation, and at the same time supplying information as to the nature of the work which the maimed soldier could undertake. In the meantime, however, we are closely studying the work done in other countries with a view to helping our crippled soldiers more effectually, and we hope in time to be able to do as much for these unfortunate men as is done in any other country.

SOME PROBLEMS OF NUTRITION IN THE ARMY.*

By MAJOR JOHN R. MURLIN,

Sanitary Corps, National Army; Chief of the Division of Food and Nutrition of the Surgeon General's Office.

Food has been defined as a well tasting mixture which, when taken into the stomach, is capable of maintaining the body in any desired state. The choice of these mixtures in the form of menus, their preparation, their digestion and fate in the body, is the science of nutrition. If we had a complete knowledge of every food substance and the transformation it undergoes in the body, just what purpose it fulfills and how it fulfills this purpose, and what becomes of it afterwards we should have a completed science of nutrition. A person is satisfactorily nourished when he is maintained in a good physical and mental status.

In our army the first requisite is to create a body of well muscled men. Any one who could see the great bodies of these men would agree that this aim is being rapidly achieved. In the muscle up period a plentiful amount of muscle forming materials, the best of which is beef, is required. The first legislation fixing the components of the army ration is dated November 4, 1775, when the Continental Congress fixed one pound of beef and one pound of bread as the allowance for each man per

day, "three pints of beans or peas at a price not to exceed \$1.00 per bushel, one pint of milk, half a pound of rice or one pound of Indian meal a week, one quart of spruce beer or cider for each man, or nine gallons of molasses for each company of men per week." The ration also included candles and soap. The ration fixed July 16, 1798, is in some respects the same as we have today. In 1818 Calhoun, who was Secretary of War, recommended that the liquor components of the ration be discontinued. This was concurred in by Surgeon General Lovell. Congress, however, failed to act, and the liquor continued as a component of the ration until 1838. In 1817 Andrew Jackson, who was commander of the army, became so impatient with the contractor system that he organized a commissary department for his own army entirely without authority from Congress. This resulted in legislation dated April 11, 1818, which laid the foundation of our modern Subsistence Department. In 1832 coffee was for the first time made a part of the ration. That which prevailed throughout the Civil War, fixed by legislation dated August 30, 1861, was as follows: Beef, twenty ounces; bread or flour, twenty-two ounces; potatoes, sixteen ounces three times a week; beans, rice, or hominy "in proportion with above." Then for each company of men, or 100 rations: Coffee, ten pounds; sugar, fifteen pounds; vinegar, four quarts; soap, four pounds; candles, 1½ pounds.

Besides the garrison ration, fixed by legislation dated January 11, 1911, the American army has the reserve ration, the travel ration, and an emergency ration. The last named has been well defined as "a substitute for nothing." The Division of Food and Nutrition in its effort to find a satisfactory emergency ration has not been entirely successful, but believes that the most satisfactory form of concentrated ration is hard bread supplemented by potted beef or ham, dried beef or sardines, and, when there is opportunity for the use of a portable cooker, three ounces of sliced bacon should be added. The ration forming the basis of feeding in training camps does not prescribe what the men shall eat. It is merely used as the basis of money allowance for the ration. A long list of substitutes is carried by the quartermaster department, but the soldiers must not spend more than the amount of money represented by the cost of the garrison ration, with certain definite percentages of substitutions, at the time and place where they are stationed. If the men do not like what the quartermaster has in store they are at liberty to take money from the quartermaster in lieu of rations and buy materials outside. This is at the discretion of the commanding general. On the whole it must be said that the mess system in vogue in the American army works well. The work of the Division of Food and Nutrition is not to supply food for the army. Its duties are largely of an advisory or inspectorial nature, and its officers are authorized to inspect all the food in camp with especial reference to its nutritive value; to seek to improve the mess conditions; to determine the actual consumption of food and amount of waste, and to report these facts to the division commander. The division now contains sixty-five officers and some fifty enlisted men. A nutritional survey party, consisting of four officers and several enlisted men,

*Abstract of a paper read at a meeting of the College of Physicians of Philadelphia, Wednesday, April 3, 1918.

spends from two to four weeks in a camp studying food conditions and making recommendations and then returns to observe improvements. One contingent has gone abroad to report to General Pershing for similar service in France. Already the food division has been able to improve food conditions and has already gathered a considerable body of information regarding the actual consumption of food and the amount of waste. Recent reports from Camp Funston and Camp Sevier show that waste has been reduced to a practically negligible point. Company commanders at their discretion can compel a man to eat at the next meal anything he has left on his plate. It has been found that the most economical way of serving men in large numbers is by the squad system in which the squad leader shall have authority over the serving of his men. The work of the food division has given the first instance in warfare in which the actual amount of food consumed is estimated directly in the camp and field. This is made possible by our system of feeding men by companies. Meat is the most economical repair material for muscle and other active tissues. The British army allows one pound of meat a day for each man; the French army, three quarters of a pound; the Italian, one half a pound. Our allowance is one and one quarter pounds, but the actual consumption in the camps in this country does not exceed three quarters of a pound. The question may fairly be asked whether the Government would not be well advised to reduce the quota of meat and replace the amount thus saved with sweets, provided as a part of the ration. The dehydration of vegetables is a question of great interest to the army and the quartermaster department has placed orders for dehydrated potatoes, onions, and carrots for the use of General Pershing's army. By simply soaking in water and boiling in the same water these vegetables are brought back to the condition of fresh vegetables and often cannot be distinguished from them. The saving of time in the company kitchen is also a highly important element. The Division of Food and Nutrition has already found a method of making meat powder by dehydration at low temperature and a high vacuum. Imagine the difference in the cost of transportation, quite aside from the cost of refrigeration of these food products. At the request of the American Red Cross the food division prepared an American prisoners' ration which could be shipped to the Red Cross Headquarters at Berne, Switzerland, and packed in parcels not to exceed eleven pounds. This is sent to each American prisoner held by Germany three times every two weeks. The list was somewhat as follows: Rice, sugar, dried beef, pork, and beans; peanut butter, soda crackers, evaporated milk, milk chocolate, desiccated strawberry jam, nutmargarine, and dried figs. At the request of the Red Cross the food division also prepared a ration to be known as the invalid ration. The following ration has been approved by the President and adopted: Unpolished rice, yellow cornmeal, sugar, potted chicken, Julienne or compressed soup tablets, dried milk powder or malted milk, beef extract, minute tapioca or other form of prepared pudding, crackers, tea, milk chocolate, marmalade, fresh fruit or fruit juice. These articles, however, are regarded as only supplementary

to those of the regular ration. The status of the science of nutrition in America is equal to its status in the land of our enemies at the beginning of the war and our Government has been foremost in the support of scientific investigations along these lines.

MEDICAL NOTES FROM THE FRONT.

War Wounds and Antisepsis.

GENEVA, February 12, 1918.

The use of antiseptics in the treatment of wounds in warfare has given rise to much thought and discussion. So I shall review the substances and methods now most generally employed and which have stood the test of an experience of over three years, but making no reference to the relative values of antiseptic and aseptic treatment.

Carbolic acid is pretty generally discarded, but still has some friends left. Bilhaut uses it in a five per cent. watery solution to which some glycerine is added in order to render the crystals of the acid more soluble. However, he does not use it for irrigation or for dressings, only for painting wound surfaces. Baumgartner advises its use, particularly in bone and joint surgery, while Leblond employs it at the strength of five per cent. in oil. Sublimite is about given up, but Hg. cyanide has taken its place. This is of particular interest to me, since I was the first to advocate its use in the United States, as the readers of the NEW YORK MEDICAL JOURNAL will recall, having published therein a signed editorial some sixteen or eighteen years ago. Danysz uses at the strength of 1:500,000 in irrigations frequently repeated, in order to avoid toxic effects.

In order to be antiseptic, alcohol should be ninety degrees at least. Iodine may be added to it in varying amounts. The following combinations have been used:

I.

Alcohol, 90°;	
Ether sulph.,	ãã 450.0 c. c.;
Iodine, .....	.....100 gm.

II.

Alcohol, 90°;	
Ether sulph.,	ãã 450.0 c.c.;
Camphor, .....	.....100 gm.

These are injected into wounds several times in twenty-four hours. The first formula is particularly useful in wounds of the limbs, while the second is employed in wounds of the abdomen and thorax, in which case the camphor acts as a tonic and hypes-thenic. In very septic wounds a combination of alcohol, ether, and formol has been used by some.

Ether has for some time been used in peritoneal irrigations for peritonitis. It can be employed pure or with iodine at 1:1,000. A ten per cent. ether-iodine mixture is still in use, or aristol, salol, camphor, or benzoin in like proportion may be used instead of the iodine.

Formol (commercial at forty per cent.) is used in five and ten per cent. solution. The following combination has been advised:

Alcohol,	}	equal parts.
Glycerine,		
Formol,		

This solution is very painful, and is dangerous when used in the neighborhood of large vessels.

Iodine is unquestionably one of the most employed antiseptics, in the form of the tincture. Chevrier has proposed a means of obtaining a prolonged action of this metalloid. A French product called *néol* is treated with sodium iodide. *Néol* has the property of giving off free oxygen for hours in the form of ozone, so that this product, plus the sodium salt produces nascent iodine for a number of hours, which colors the solution a brownish yellow. The sodium salt is preferable to potassium iodide because it is less caustic to the tissues.

Chevrier calls a *pure solution* of iodated *néol* a mixture of equal parts of *néol* and a one per cent. solution of sodium iodide. The normal solution is:

Néol;
Sol. sodium iodide at 1 per cent. 1 part;
Water, 3 parts.

It can be made weaker by adding four or five parts water. The mixture is made at the time of use, or, better still, directly in the wound. It is only to be used for dressings, never in irrigations, and must not be used around the scrotum or eyes.

We are all familiar with the colloids in general, and the electrochemical colloidal iodine has been proposed as a very powerful antiseptic. It is obtained by dissociation of metalloid iodine with an electric current. It is nearer to the chemical colloids of the collargol series, but its grains are smaller than the colloids prepared by Bredig's method. It is held in a twenty-five per cent. suspension in sterile olive oil, washed with alcohol and saturated with a hydrocarbon in order to prevent the iodine from combining with the fatty body. The product is very diffusible, and not caustic. It has been found very satisfactory in the treatment of bad septic irregular wounds, and Auregan, who has treated tetanus by serotherapy with or without disinfection of the focus with colloidal iodine, obtained 28.8 per cent. more recoveries when it was used than when serotherapy was alone employed.

Many other iodine preparations have been essayed, but have not given any better results than the combinations above mentioned, so I shall not refer to them. There has been much discussion as to the antiseptic value of iodine in the treatment of war wounds. Certainly it has not prevented the development of gas gangrene or tetanus, even when applied directly after the receipt of the injury. Now, although it is unquestionably excellent when applied to fresh wounds, it certainly is not active in the case of old ones, and it is not tolerated by some wounds. It should always be applied by the surgeon himself, and never left to the nurse. A five per cent. tincture of iodine is perhaps, on the whole, the most satisfactory; the solutions of iodine in chloroform or the tetrachloride of carbon do not appear from all accounts to be better than the alcoholic solutions. Oxygen is largely used in the form of oxygenated water. It must be absolutely neutral and diluted one half or one quarter its strength. It must not be used in large, bleeding wounds, as gas embolus is to be feared. It is particularly recommended in recent wounds on account of its stimulating and mechanical action, and also in gangrenous wounds. Powdered potassium permanganate gives off its oxygen in presence of the organic secretions, and is said not to be toxic. Zinc peroxide enjoys

the same property when dusted over wound surfaces. Oxygen heated at 1,000°, in order to produce ozone, is produced with a Gaiffe apparatus of 120 volts. When sprayed on the wound, the superheated oxygen carbonizes it superficially and a complete sterilization is obtained. This must be done under general anesthesia.

Of turpentine and various antiseptic compounds which have been devised I shall not speak. Some of them are undoubtedly effective, but I question if any thoroughbred surgeon would care to make their acquaintance.

Danysz has shown that antiseptics develop their full action when used in very dilute solution. If an infected tissue be placed in a dialyzer with a mixture of serum and broth, and is then placed in running water, and if an antiseptic is added, the solutions giving soluble compounds with protein matter are the most powerful antiseptics. Sublimate coagulates albuminoids up to a one in 20,000 solution. Up to a one in 50,000 dilution the proportion on insoluble compounds decreases, and then at length sublimate will only give rise to soluble compounds. Cyanide of mercury is not toxic at one in 500,000. In the experiment with the dialyzer, the prolonged action of the very diluted antiseptic solutions is enough sometimes to completely sterilize the contents of the dialyzer.

Diluted alcohol has a more powerful action on the pyocyanic bacillus than absolute alcohol. Silver nitrate is low in toxic power, and twenty-four grams can be ingested without any severe symptoms arising. It is also topical in action, becoming fixed at the point to which it is applied, probably because it becomes attached to the envelope of the cells, which is their least vital part.

An intravenous injection in a rabbit's ear at the dilution of 1:50,000 destroys the endothelium, the destruction being less evident when 1:100,000 solution is used, while at 1:200,000 no lesion results. A solution of silver nitrate at 1:1,000,000 kills nearly all bacteria in the water, and this is also true of a 1:500,000 solution. If the bacteria are in broth a solution of 1:500,000 to 1:200,000 is necessary to kill them. The salt contained in the broth forms silver chloride, which is almost insoluble. A 1:200,000 solution can be kept for a long time if very pure distilled water is used, but if boiled water is used, in order to avoid the formation of silver chloride, the solution should be made fresh for use.

If epidermization of a wound is desired, a 1:500,000 solution should be employed, as the epithelial cells are sensitive. The wounds should be irrigated with this solution twice daily. It has been successfully employed in suppurating wounds. Chlorine as a disinfectant has been known for some time, but recent researches have brought it back to use, particularly the hypochlorites. Labarraque's solution is composed of calcium 100 grams, sodium carbonate 200 grams, and water 4,300 grams. Tavel's solution is not stable, and should not be used in wound treatment.

Dusting wounds with a powder composed of one part calcium chloride and four parts boric acid will result in the slow liberation of hypochlorous acid of several hours duration, and some believe this

method superior to all others. Ammonium chloride has been used in a 1:10,000 as an antiseptic. Physiologic salt solution contains sodium chloride, Locke's serum calcium, and sodium chloride, while a solution of magnesium chloride has been advocated by Delbet. These solutions are not employed as antiseptics. Dakin and Carrel's solutions are so well known to all that they need not be referred to. I would only say that opinion is greatly divided as to their effectiveness in war surgery.

Cohen and Dakin have studied the sodium salts of the aromatic sulphochloramides, particularly the derivatives of benzene and toluene. In these bodies, the chlorine being combined with nitrogen, they do not dissolve necrotic tissue.

Paratoluenesodiumsulphochloramide (one would fancy that this is a word of the land of *kultur*, but it is not) at 1:10,000,000 kills the perfringens in suspension in water, in two hours. If this bacterium is suspended in serum a concentration of 1:2,500 to 1:5,000 is necessary. The staphylococcus in water is killed by a 1:1,000,000 solution; when in serum, by a 1:2,000 solution. The pyocyanic in water is killed by a 1:100,000 dilution, and in serum by a 1:1,500. Dakin recommends a four per cent. solution for clinical purposes. Mayer has proposed the use of magnesium hypochlorite. This he obtains by treating 190 grams of magnesium dissolved in two litres of water with calcium chloride, 100 grams diluted in two litres of water. To separate the precipitate of calcium sulphate the mixture is filtered. A noncaustic excess of magnesium remains. The clinical results of this product have not as yet reached me.

Bifluoride of ammonium has been obtained by Kritschewsky by the action of ammonium carbonate on fluorhydric acid. It has been advised on high surgical authority as an antiseptic in a 7:1,000 solution.

CHARLES GREENE CUMSTON.

MEDICAL NEWS FROM WASHINGTON.

Instruction at the Naval Medical School.—Candidates for the Dental Corps.—What Is a Naval Surgeon?—Senator Owen's Bill.—What the Bill for Vocational Rehabilitation Promises.

WASHINGTON, D. C., May 18, 1918.

Another course at the Naval Medical School at Washington began on May 15, with a class of thirty newly appointed members of the Medical Corps of the Naval Reserve force. The course will be of six weeks' duration, and it will cover practically the same field as previous courses for members of the regular Medical Corps, except that it is somewhat shortened. Medical Director E. R. Stitt, of the navy, is in command of the school.

* * * * *

An examination has just been completed at the same school, of some forty candidates for appointment to the regular Dental Corps of the navy. There are at least fourteen vacancies in the grade of dental surgeon, but it is expected that any qualified candidates above this number will be given temporary appointments in the Dental Reserve Corps until vacancies occur in the regular corps.

The Comptroller of the Treasury has informed the United States Employees' Compensation Commission that a naval surgeon acting in the capacity of a private physician, doing surgical work in a private hospital or a private home, is not entitled to present bills or to collect fees in connection with work done to United States employees injured while in the performance of their duties.

According to the comptroller, "the naval surgeon is a medical officer of the United States, and the Government is entitled to his whole time, so that at least he cannot have the Government as a private pay patient, which would be the effect of compensating him for services to injured Government employees payable by the United States. Where he renders such service, it is rendered in the time of the Government."

* * * * *

No action yet has been taken on the bill introduced by Senator Owen, of Oklahoma, to increase the Army Medical Department. A subcommittee, which includes Senators McKellar, of Tennessee, and Warren, of Wyoming, has been appointed to report on the pending legislation to the Senate Military Committee. Senator Warren is absent in Wyoming, and it has been agreed that no report will be made until his return to Washington. Representative Hicks has introduced a bill providing that the Surgeon General shall be a member of the General Staff Corps.

* * * * *

The bill providing for vocational rehabilitation and return to civil employment of disabled persons discharged from the military and naval establishments has been passed by the House. One section of the bill provides for the control by the army and navy over the disabled soldier or sailor during the period of his functional rehabilitation—that is, while he is undergoing medical, surgical, or other treatment to physically and mentally rebuild him. It also is provided that, in case he should have bedside or curative treatment, called provocative training, the vocational board shall act as an advisory body only for this character of training. In making plans for vocational training, the vocational board shall co-operate with the War and Navy departments to insure against disturbance of a continuous process of useful training.

Rating Soldiers for Promotion.—Dr. Walter Dill Scott, of the Carnegie Institute of Technology, was selected by the Government several months ago to perfect a system of rating privates in the National training camps for promotion. Doctor Scott is well known throughout the country as an eminent psychologist and a student of the human factor in industrialism. He perfected a system of rating candidates for promotion that is officially endorsed by the War Department and has been used in the promotion of 27,000 officers on our National Army. Doctor Scott surrounded himself in his work with big men in the commercial field who have shown ability as leaders of men and proven well qualified for this work. A man who has recently returned from service with Doctor Scott and who is well known to the drug trade is Woods A. Caperton, salesmanager of Eli Lilly & Company.

Editorial Notes and Comments

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A Weekly Review of Medicine

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SASKATCHEWAN AND THE DRUGLESS HEALERS.

Saskatchewan, like the province of Ontario, was troubled with the "drugless healers" flux. The government there, too, some time ago appointed a Special Commission to inquire into the various cults doing business in that province. The report of the Special Commission was issued, the Council of the College of Physicians and Surgeons went very thoroughly into the report, also into the draft legislative measures as a result. A decision was arrived at by the council which was in the form of a recommendation to the legislative body that the practitioners of medicine and irregular practitioners should be kept separate and distinct. The legislative body fell in with that suggestion. Presto! An amendment to the Medical Profession Act of the province; a new act respecting drugless healers.

So far as the amendment to the Medical Profession Act concerns the medical profession of that province, a worthy feature seems to be that it defines specifically unprofessional conduct. As the substance of that is of special interest to med-

ical men in America, as there is said to be considerable emigration from the United States into Saskatchewan and the sister province of Alberta, the clauses from the act are here set out in full: (a) Wilful betrayal of a professional secret; (b) abandonment of a patient in danger without sufficient cause and without giving him an opportunity to retain the services of another physician; (c) the giving of a false statement or certificate respecting birth, death, the notice of disease, state of health, vaccination or disinfection or respecting any matter relating to life, health, or accident insurance; (d) dividing between physicians or between physicians or druggists any fees or profits that may result from either consultations or surgical operations without the patient's knowledge or consent; (e) the habitual use of alcoholic liquors or narcotics; (f) impersonation of another licensed practitioner.

In respect of clauses (d) and (e) this, so far as ascertainable, is the first instance of legislative enactment upon either or in any province of Canada. They are both to be heartily commended. A qualified medical man under this act henceforth going into the province of Saskatchewan may be granted a provisional permit to practice in remote districts for a specified time, such special permit being granted by the Council of the College of Physicians and Surgeons, and under their control.

The Drugless Practitioners' Act is specially interesting on the subject of unqualified people usurping the title "doctor" without let or hindrance, as has so often occurred in Saskatchewan and the other provinces of the Dominion; likewise, elsewhere. The law upon that is here set out: "A drugless practitioner may use words or symbols to designate his calling, and for this purpose may employ the term 'doctor' or 'physician,' provided it is used in connection with words indicating that he is a drugless practitioner or practises some branch of drugless healing, or he may adopt the title 'manipulative surgeon,' but otherwise he shall not use the letters 'M.D.' or the prefix 'Dr.' or the term 'Doctor' or 'Physician' or 'Surgeon' or the words 'Doctor of Medicine' or 'Physician and Surgeon' in connection with his name, nor shall he by advertisement, announcement, or otherwise represent himself as physician or surgeon." And further. "A drugless practitioner shall not prescribe or administer drugs or medicinal preparations, or treat any

venereal disease or any infectious or contagious disease as defined by the Public Health Act of that province, nor shall he perform any surgical or obstetrical operation unless he holds a general license for the purpose."

Of the drugless healers who practised in Saskatchewan six months prior to December 31, 1917, only he who can show "that he holds a diploma from an incorporated school or college of osteopathy or chiropractic, empowered to grant such and approved by the University of Saskatchewan," shall be admitted to the register and licensed to practice. No correspondence graduates are allowed. Furthermore, in the act it is provided that "the University of Saskatchewan shall hold two regular examinations, and such supplemental examinations as may be deemed advisable, each year, in accordance with such regulations as may be prescribed for the purpose by the senate of the university. The university shall consult with such drugless healers as may be deemed advisable concerning suitable persons to examine in the subjects required of candidates for license as drugless practitioners."

Whether the case in Saskatchewan was the same as that in Ontario, it was known in Ontario that so called drugless healers were very satisfactory patrons of the drug supply houses of that province. They—the devotees of the art—did not live up to their name and their cult. Now, however, Saskatchewan has enacted a law on the whole subject. When examinations are prescribed, a course of study required, and limitations placed upon practice, irregular practice will not likely flourish like the proverbial Green Bay horse—beg pardon!—green bay tree.

THE ETIOLOGY OF CONGENITAL OPHTHALMOPLEGIA.

Congenital ophthalmoplegia is an affection which appears to be more prevalent among boys, the proportion being sixty-five per cent. in these and thirty-five per cent. in girls, this high percentage in boys coinciding with the malformations in general, which are much more frequent in this sex.

The affection is hereditary and familial in nearly fifty per cent. of the cases. In one case the affection was transmitted by the mother to her three children; in another, by the mother to her daughter, and the latter in turn transmitted it to her son, who also had a son afflicted by congenital ophthalmoplegia. In Gourfein's case the affection passed from the grandfather to the father and to his four sons. In Lawford's case

the disease was transmitted by the father to three out of seven of his children, one of the remaining four presenting a congenital ptosis.

Generally speaking, the affection is familial, several members of the same family being afflicted. In Gourfein's case, it would even appear that the disease selected the sex in which it appeared, and it seemed as if the first born of the family were those in which it occurred, quite contrary to what was observed in Lawford's case. In other instances the disease is familial in the sense that cousins or other blood relations have been subjects of the malady.

The affection is always congenital. The children are born at term in good health or otherwise, and usually there is no history of difficult labor requiring the use of the forceps. The children do not offer any luetic manifestations, although in Tilley's case the father was considered syphilitic, and in Henck's case there was an increase in size of the epiphyses and various cicatrices, indicating a rachitic condition.

As to other malformations or anomalies occurring at the same time as the ophthalmoplegia, three cases presented closed fontanelles, others a flattening of the lower border of the orbit and malar apophysis; the existence of the epicanthus with partial congenital paralysis of the ocular muscles in the son of a congenital ophthalmoplegic; the presence of a very marked subcutaneous venous circulation in the upper lids and an exaggerated development of the down; protrusion of the eyeball, very marked excavation of the papilla and staphyloma; an abnormal pigmentation of the fundus oculi; malformations of the hands, fingers, and feet, and finally, anesthesia of the trigeminal nerve and facial paralysis. A tardy bodily development has been recorded, and in two cases the infants' eyes remained closed for two weeks following birth.

As to the antecedents of the parents, there is little to be said, and, making abstraction of the familial cases, no antecedents of congenital or acquired ocular affection has ever been noted. Syphilis and tuberculosis in the father or mother have once or twice been suspected, but the data pertaining to this point is too vague to be seriously considered. In no case has alcoholism or miscarriage been recorded, but consanguinity is noted in Gunn's case. None of the parents have apparently had a congenital defect, and in only one instance is congenital trouble mentioned in the collateral antecedents, this being a paternal aunt of the patient, who had a very marked strabismus.

It is clear that serious foundations for estab-

lishing the etiology of congenital ophthalmoplegia are decidedly wanting. Perhaps tuberculosis, syphilis, and all the common factors resulting from infectious diseases or intoxications act by the hereditary channel or directly upon the fetal organism during pregnancy, but this is simply an hypothesis. Neither is it probable that accidents which may disturb fecundation or gestation have any part in the etiology of the affection. However, they should not be completely eliminated, because their influence in teratologic etiology, in its broadest sense, is unquestionable.

CONSISTENCY.

Yearly, in a few cases, a mad dog scare is produced by the presence in the community of a genuinely rabid animal. At once a whoop and a halloo sounds not only through the town but throughout the State, and an edict goes forth for the muzzling and leashing of all dogs. So great is this annual agitation and so sure the legislation, that one might suspect the manufacturer of muzzles to be at the bottom of it all. However, there is quite sufficient cause for this effective effort at control, in that hydrophobia is a rare disease with striking symptoms. If only other diseases were as uncommon and as spectacular!

A muzzle for a mad dog is a most effective means of prophylaxis, provided it is really worn, and it should not only be applied to the dog but kept on as long as is necessary to stamp out this dread disease, but why not muzzles or something in kind for man? There are but a few hundred cases of disease transmitted by the bite of sick animals per annum in this country, but a thousand, doubtless a hundred thousand times as many persons suffer from serious disease by mouth transmission from the human animals with whom they come in contact.

Muzzles, if we may use the general term, are to be seen on surgeons in many operating rooms in order to prevent droplet inoculation of the field of operation, and are worn patiently and without much discomfort for hours at a stretch, but then the surgeon cares much for the results of his intimacy with the insides of the patient before him. We observed recently, in a city laundry, that one of the women feeding a large mangle with towels and napkins wore a similar protecting mask, though she neither coughed nor sneezed in the few minutes we watched. This is certainly a refinement of prophylaxis, worthy of all emulation, even if this were compulsory, for here the person who might possibly be infected from sputum was not only hidden far away among the millions of a great city, but there lay between

her and that possible receptive host the heat of the mangle, which in so many laundries is advertised to "sterilize everything."

In dire contrast to the refinements of prevention represented by the surgeon and the laundress, there lies the great army of the unmuzzled, whether abed, convalescent, or "carrier," in the too narrow sense, who go about coughing, sneezing, spitting, talking, or otherwise spraying the germs of pneumonia, tuberculosis, diphtheria, influenza, sore throat, or what not, over our food, napkins, into the air we breathe, or directly into our mouths. If it is wise and practical to muzzle a laundress, is it any less so to cover the mouth of the man who milks our cow or who cooks or serves our victuals? If the surgeon and nurse can muzzle themselves for the sake of their helpless patient, cannot the proud possessor of a cold or sore throat thus protect the innocent victim who must come in contact with him? It would certainly be less of an inconvenience than the wearing of the masks all day, by workers in some industries, for self protection.

Of course dogs are not consulted as to their likes in the matter of wearing muzzles, but should human animals be, where life and health are concerned? Of course, when it becomes "the style," muzzles will be worn by men, and especially women, with pleasure. Yet the sick abed should not care much for appearances, and as for others, a handsome fan or an elegant pocket handkerchief before the face is not unbecoming. As a special invention for the purpose a screen of glass or celluloid with a handle after the manner of an enlarged lorgnette might not only be inoffensive to the fastidious and certainly as becoming as one or more glasses for the eyes. Seriously, patients and the public should be urged to use some such means of preventing the showering of their fellows with their microbes as they would abstain from spraying them with any other poison, while all those who serve the public in a capacity that renders their discharges dangerous, should be compelled to wear a protecting mouth and nose mask while at work.

RENEWING PRESCRIPTIONS.

The good mother, or the chronic invalid of the family does not throw away the magic, unintelligible prescription when the need for it is past. No, she treasures it as carefully as a love letter, for it not only cured her but cost money, and who knows that some of the family may not have the same complaint? Besides, there are neighbors—impecunious ones—and it is a kindly act to lend the prescription and save them expense. We have known one from Sir Russell Reynolds, hardly decipherable and much

mended by gum paper, which had been used and lent for some twenty years without regard to age, sex or individual symptoms. Another evil is that many pay only one visit to the doctor, when they get a prescription, of which he meant to see the result, but they cannot or will not return, yet, with dull conscientiousness, continue to take the medicine, in some cases getting to like it or rely on it if it contain a stimulant meant only to tide them over a crisis.

But there is another evil ahead when the kind hearted or commercially minded druggist uses prescriptions wholly or as a guide for dispensing himself. We have even known them say "That only contains so-and-so; I can give it you in this patent medicine, which will only cost you half as much." It need scarcely be said that he does not do so except with the prescriptions of out of town doctors. A curious but true story is told of a rich lady afflicted with a persistent scalp trouble who was told that she must patiently use the remedy given by one of the leading dermatologists in London for a month. This meant curtailing her social pleasures a little, so she speedily tired. But the disease being worse when she was once staying at the seashore, she went to the local druggist and showed him the prescription, asking for something speedier in its effects. He said he had a splendid cure, efficacious in hundreds of cases, but the patient must stay right there in the town and let him apply the remedy, adding, I will make one condition; if cured, you must give me £100 and, if I fail, nothing." His confidence and terms were convincing, so she submitted, and at the end of the month, the scalp was quite clean and the £100 paid. On returning to London she laughingly boasted of the cure to the doctor who had failed to help her. Soon after, he was spending a week end at the place she had stayed at, and, as a matter of curiosity, asked the druggist what he had used. The druggist, who had been a fellow student long ago at Guy's Hospital, grinningly answered that he had used the remedy prescribed by his friend, recognizing its value!

A solution is difficult, but, meanwhile, if the carefully tied up bundle of prescriptions, each one labelled "For Johnnie's sore throat," "For Mary's bad leg," etc., could be abstracted from the family archives, much harm would be averted from the home and neighborhood.

A NEW SWISS PERIODICAL.

The recent appearance upon the medical horizon of a new periodical is an incentive to fresh courage and activity in the scientific world. It comes from one of the few nations able to maintain neutrality

in the struggle that is either preventing scientific advance along the ordinary lines of peace or else absorbing all effort into warfare or in rebuilding what war has destroyed. The new Swiss *Archives of Neurology and Psychiatry* comes forward to throw itself into the breach, continue the work otherwise so largely interrupted and to stand ready when the war is over "to renew the scientific alliance between the nations which the war has divided." Its name in reality is printed in German, French and Italian, significant of its broader cosmopolitan purpose as well as of its place as an organ for the separate parts of Switzerland which speak different tongues, and of its close geographical and scientific relation to these three languages. The names upon its editorial staff and board of supporters give assurance of the high character of the work to be expected, and the high ideals medically and internationally for which it will stand. With such names as that of Professor Monakow as chief editor, Professors Dubois, Bleuler, Villiger, Manzoni, and others associated with him, both the neurological and the psychiatric interests are well provided for.

The need of such a journal has been particularly felt since, as the editor in chief expresses it, the Swiss Neurological Society as well as the Swiss Association of Alienists have had no organ in which to collect and report the proceedings of their meetings or the individual research work of their members. They have been too long merely dependent upon the hospitality of foreign journals, those of Germany for the German speaking workers, those of France for those who work among the French speaking portion of the country. An opportunity will now be at hand for surer and quicker publication, less expensive than through private publication or through the brochures which have been published of society proceedings. Private and official matter will thus be more accessible for interchange among the workers themselves and will be brought also to a larger circle of readers. This will in turn give impetus to individual work and to the dissemination of results won among an increasingly wider group of neurologists and psychiatrists.

This first number fulfills the promise given not to devote undue space to one branch of interest in neurology and psychiatry but to touch on neurology, anatomy, physiology, pathology, clinical experiences, psychiatric problems, also to supply good illustrations freely. Now, when our shelves are absolutely bare of so much that came from abroad and was instructive and stimulating in neurology and psychiatry, this periodical should give especial satisfaction and encouragement. Only one number has yet found its way to us, but it presages good things.

News Items.

Meetings of Medical Societies to Be Held in Philadelphia during the Coming Week.—Monday, May 27th, Genourology Society, North Branch of the County Medical Society; Tuesday, May 28th, Jewish Hospital Clinical Society, West Philadelphia Medical Association; Friday, May 31st, Southeast Branch of the County Medical Society.

Two More Medical Colleges Admit Women Students.

Announcement is made that McGill University, Montreal, will hereafter admit women students to the study of medicine and dentistry. Washington University, St. Louis, has also opened its School of Medicine to women, thus making the institution coeducational in all departments.

Meetings of Medical Societies to Be Held in New York during the Coming Week.

Tuesday, May 28th, New York Academy of Medicine (Section in Obstetrics and Gynecology), New York Dermatological Society (annual), New York Medical Union, Metropolitan Medical Society of New York City, New York Otological Society, New York Psychoanalytic Society, New York Riverside Practitioners' Society, Therapeutic Club, Valentine Mott Society, Washington Heights Medical Society.

Doctor Warbasse Reinstated.—At a meeting of the executive committee of the Kings County Medical Society, held Tuesday evening, May 21st, Dr. James P. Warbasse was restored to membership in the society. Dr. Warbasse had been charged with having intimated, in an article published in a medical journal, that persons of wealth could obtain certificates from physicians showing them to be physically unfit for military service. He was able to give a satisfactory explanation to the members of the society. A committee has been appointed to investigate the charges.

A New Home for the Bronx Hospital.

Announcement is made that the Bronx Hospital and Dispensary, at present situated at 1385 Fulton Avenue, New York, will move into new quarters next fall. The directors have purchased the property at Fulton Avenue and 168th Street, known as the Eichler Estate, consisting of three main buildings and twelve city lots. Alterations will be started immediately, and as soon as completed the hospital will be opened with about one hundred beds. Dr. Alexander Goldman is president of the board of directors.

Personal.—Dr. Charles William Strobel has been appointed to the staff of the Skin and Cancer Hospital.

Captain Ethelbert T. Smith, son of the late Dr. E. Franklin Smith, who one year ago enlisted as a private in the Service, has been commissioned a captain in the United States Ambulance Corps and ordered to Italy for duty.

Dr. Alfred Gordon, of Philadelphia, addressed the Gloucester County (Pa.) Medical Society, on Thursday, May 16th, on Mental Deficiency from the medical, social, and legal standpoints.

Dr. Charles H. Jaeger has been appointed assistant professor of orthopedic surgery at the College of Physicians and Surgeons, Columbia University, New York.

Public Health Officials to Hold a Conference.

The sixteenth annual joint conference of the United States Public Health Service with State and Territorial Health Officers will be held in Washington, D. C., on June 3d and 4th. The sanitation of extra cantonment areas, especially as related to the work of the State and local health authorities, will be one of the subjects on the program. Reports will be made as to the success of the co-operative arrangement developed during the past year for preventing the interchange of disease between civil and military populations. Attention will also be given to the control of venereal diseases, cerebrospinal meningitis, typhoid fever, trachoma, hookworm, and pellagra in relation to the health of the military forces. Each of these diseases will be discussed separately, but all communicable diseases will receive consideration in their relation to the public health during the war. Other subjects which will be discussed are the relation to public health of industrial hygiene and sanitation, especially in war industries; the care of the health of tuberculous soldiers on their return to civil life; the use of records of drafted men for public health purposes; effects on the public health of the forthcoming shortage in the medical profession. The desirability of securing better morbidity reports, and the question of pure water supplies for railroads will also be discussed.

National Tuberculosis Association.—The revised programme of the annual meeting of this association, to be held in Boston, June 6th, 7th, and 8th, shows that several changes have been made since the preliminary programme was issued in April. The dinner meeting of the American Sanatorium Association, announced for Thursday, June 6th, will be omitted and a short business session will be held at 5 p. m. Friday. Dr. Charles J. Hatfield, 381 Fourth Avenue, New York, is executive secretary of the association and will be glad to furnish complete programmes to all who are interested.

American Pediatric Society.—The thirtieth annual meeting of this society will be held in Lenox, Mass., Monday, Tuesday, and Wednesday, May 27th, 28th, and 29th, with headquarters at the Curtis Hotel. An elaborate programme has been prepared which includes the reading and discussion of fifty papers covering a wide range of subjects by eminent pediatricists, and the meeting gives promise of being unusually interesting. Dr. L. E. La Fita, of New York, is president of the society, and other officers are as follows: Dr. H. M. McClanahan, of Omaha, vice-president; Dr. Howard Childs Carpenter, of Philadelphia, secretary; Dr. Charles Hunter Dunn, of Boston, treasurer; Dr. O. M. Schloss, of New York, recorder and editor.

American Therapeutic Society.—The nineteenth annual meeting of this society will be held in the Jefferson Hotel, Richmond, Va., Friday and Saturday, June 7th and 8th, under the presidency of Dr. W. Wayne Babcock, of Philadelphia. Dr. Stuart McGuire will deliver an address of welcome, to which Dr. Reynold Webb Wilcox, of New York, will respond. The subject of the president's address will be The Treatment of Wounds in War. Other subjects which will be discussed are Disorders of the Intestines and Their Treatment, Management of Some War Conditions; Treatment of Psychoses and Neuroses; Ductless Glands and Their Relation to Therapy; Infections or Intoxications and Their Management; Cardiac Diseases and Their Treatment; Drugs and Their Uses. Dr. Lewis H. Taylor, The Cecil, Washington, D. C., is secretary.

Changes in the Faculty of Harvard Medical School.

Many promotions and other changes in the medical faculty were announced at a recent meeting of the Board of Overseers of Harvard University. Dr. Richard C. Cabot was elected clinical professor of medicine, Dr. Eugene A. Crockett was elected Le Compt professor of otology, and Dr. P. S. Newell, clinical professor of obstetrics. Dr. Worth Hale has been appointed secretary of the medical faculty, to succeed Dr. Melver Woody, who has been commissioned in the Medical Reserve Corps and called to active duty. Dr. W. G. Webber, of the department of preventive medicine and hygiene, has also entered government service. Other appointments were as follows: Dr. Edward A. Boyden, instructor in comparative anatomy; Dr. Ernest W. Goodpasture, instructor in pathology; Dr. Frederick S. Burns, instructor in dermatology; Dr. Calvin G. Page, instructor in bacteriology; Dr. Robert M. Green, instructor in anatomy; Dr. Fritz B. Talbot, instructor in pediatrics; Dr. Charles H. Dunn, instructor in pediatrics; Dr. Edwin A. Locke, assistant professor of medicine; Dr. William J. Crozier, resident naturalist of the Bermuda Biological Station for Research.

Assistant Medical Inspector of Schools.—Among the positions for which the State Civil Service Commission will hold examinations on June 29th is that of assistant medical inspector of schools; salary, \$3,000. The examination is open to men only, and applicants must be physicians, graduates of a medical college approved by the University of the State of New York, and licensed to practice in New York State. They must have had at least five years' experience in the practice of medicine, at least two years of which must have been in health inspection or health education. Applicants should show familiarity with the various physical conditions of school children and be able to teach preventive and corrective measures, and also have a general knowledge of the organization and administration of the public school system of the State, and be familiar with the State rules and regulations with reference to the prompt recognition and suppression of communicable diseases. Preference will be given to those with successful experience in constructive, administrative, and educational work in school medical inspection. For the proper application blanks address a postal card to State Civil Service Commission, Albany, N. Y.

Modern Treatment and Preventive Medicine

A Compendium of Therapeutics and Prophylaxis, Original and Adapted

RECENT OBSERVATIONS IN DIGITALIS THERAPY.

By LOUIS T. DE M. SAJOUS, B. S., M. D.,
Philadelphia.

In the case of but few of the older drugs has so marked an expansion and transformation of our knowledge occurred as that which has taken place with the digitalis group in the last decade. This transformation has been effected not only through the utilization of new, very precise and searching methods of ascertaining modifications in the cardiovascular functions, whether due to disease or to drugs, but also to the realization that observations with large doses of the cardiotonic remedies in animals often cannot be directly applied to disease problems as they occur in the human subject, careful study of the effects of small doses in man under various circumstances being therefore a necessity. Again, experiments conducted in normal individuals, whether in man or the lower animals, are peculiarly apt to fail in the case of the digitalis group to reflect the therapeutic capabilities of these drugs under abnormal conditions. Thus, Hewlett, 1917, studying the effects of strophanthin, intravenously administered in six patients with a normal sinus heart rhythm, including two showing the "pointed" pulse of fever and two others suffering from mild cardiac decompensation, observed no striking changes in the pulse flow, while in a seventh, who showed auricular fibrillation, a slowing of the ventricular rate was noticed, together with an increase in the size of the individual pulse waves. While some of the recent investigations of digitalis action are perhaps not of such fundamental clinical importance as supposed, yet there remains much that has a more or less immediate bearing on the work of the practitioner, and a brief review herein of some of the newer gleanings in this field may therefore be not inappropriate. Throughout it will be advisable to consider only as suggestive, and not as conclusive, experimental work in animals, not yet correlated with or supported by observations in the human subject.

Actions of digitalis on the heart.—Recent studies have brought into special prominence the effects of this drug in overcoming certain definite types of irregular cardiac rhythm; yet the significance of these disturbances should not be overemphasized, and investigations of the precise mode of action of digitalis in relieving decompensation, irrespective of any arrhythmia existing at the time, are still of great interest.

The increased output of blood from the heart under therapeutic doses of digitalis is commonly ascribed to the combined effect of a slowing of the cardiac rate, chiefly through stimulation of the cardioinhibitory centre in the medulla, and of an increase in the vigor of the individual contractions, due to direct excitation of the heart muscle. Experimental work has indicated on the part of digitalis the power to increase both the contractility, tonicity,

and excitability of the myocardium, and even clinical experience with moderate doses leaves little doubt as to any of these properties.

Of late many have discussed the question as to which of the two chief digitalis actions—the cardio-inhibitory or the direct exciting action on the heart muscle—is the more important in its clinical results. According to Gottlieb, 1914, slowing of the heart rate under digitalis clinically occurs only in the presence of auricular fibrillation, and does not account for the benefit commonly noted from this drug in conditions of venous stasis unassociated with arrhythmia or an abnormal pulse rate. A. E. Cohn, 1915, writing of cases in an early, rather than advanced, stage of heart disease, with normal heart rhythm, no edema, and the blood pressure within normal limits, reports the slowing action inconstant in this type. He says the sinus rhythm, *i. e.*, that resulting from impulses arising at their normal site of origin, is slowed by digitalis only in hypodynamic hearts; ventricular slowing from digitalis does occur after considerable doses have been given for some days, but is merely the result of a partial blocking of the auricular impulses before they reach the ventricle. Similar in its purport, apparently, is the statement of C. S. Williamson, 1913, to the effect that slowing due to direct vagus action occurs only with large therapeutic doses. According to Sollmann, 1917, patients with auricular fibrillation, or with adynamic or unstable hearts, respond constantly by slowed pulse to ordinary doses. Fairly normal hearts, however, are slowed by large doses, such as 0.4 gram a day for five to seven days. Sollmann seems disposed to accept Cohn's view that slowing of the rate under large doses of digitalis in hearts not as yet severely diseased is due, not to retardation of impulse production at the sinus, but to partial blocking of the impulses in their transmission from auricle to ventricle. All these statements, it will have been noticed, would lead one to the belief that in the milder degrees of cardiac involvement, benefit from digitalis—if such benefit be produced—results rather from a stimulating or tonifying action directly on the myocardium than from a slowing of the heart rate.

Apparently in opposition to the conception just mentioned are the views of a number of recent students of the digitalis effects. According to H. C. Wood, Jr., 1915, the most constant and earliest appearing effect of relatively small doses of digitalis is slowing to the pulse rate. The increased vigor of contraction and augmented tonicity, while perhaps manifestations of the action of therapeutic doses, occur later than the pulse rate retardation. Sutherland, 1917, goes considerably further, asserting it has not been shown that digitalis in medicinal doses has any direct effect on the wall of the left ventricle, and consequently, one must not assume that digitalis clinically acts on the ventricular muscle. According to this observer, in the cardiac involvement and insufficiency following rheumatic fever, rapid heart action *per se* is an important factor in pro-

ducing the cardiac weakness which leads to symptoms. The main beneficial action of digitalis in such cases is exerted through stimulation of the vagal inhibitory function, the rate of impulse discharge at the sinoauricular node being thus diminished and the ventricular rate, in turn, made slower. The result is a period of rest for the heart muscle from excessively frequent contraction, with consequent restoration of tone and contractile power. Sutherland assimilates the action of digitalis on such hearts to that of rest in bed, which, while manifestly exerting no direct tonic action on the cardiac muscle such as digitalis has been believed to produce, frees it from the prejudicial influence of rapid heart action due to physical exertion or mental excitement.

(To be continued.)

Results of Surgical Treatment during the Last Aisne Offensive.—Tuffier (*Bulletin de l'Académie de médecine*, February 5, 1918) reports on a large number of wounded treated during two weeks of artillery preparation and offensive fighting. Shell wounds constituted seventy-two per cent. and bullets seventeen per cent. of the whole number. Twenty per cent. of the cases could not be transported to hospitals. The head was the part injured in sixteen per cent.; the lower extremity, in thirty-three per cent.; the upper extremity, in thirty-four per cent.; the thorax, in ten per cent.; the abdomen, in four per cent., and the spinal column, in 2.6 per cent. Twenty per cent. of the cases had more than one wound. The mortality among all those treated was 5.18 per cent.; among the untransportable cases, 17.7 per cent. Gas gangrene set in in only 0.3 per cent. of the cases, and tetanus in 0.05 per cent. Among the cases wounded in the abdomen, eighty-six, or eighteen per cent., were subjected to laparotomy, but the mortality remained high—sixty-one per cent. Among those wounded in the chest, 106 were subjected to thoracotomy, with a twenty per cent. mortality. Of 1,736 cases of craniocerebral injury, 9.67 per cent. were decompressed. The mortality among such cases was 13.33 per cent. The treatment of fractures yielded excellent results. Of 231 grave fracture cases, twenty-six were moribund when received; in 115 cases the fractures were closed primarily or secondarily, while in eighty-seven primary suture was resorted to, with success in 73.4 per cent. of the cases. Wounds of the soft parts showed the best results of all, and were operated in, on an average, fifteen hours after the injury. Mechanical disinfection by excision, with prompt suture of the wound, was carried out in about eighty-five per cent. of all these cases; with delayed suture, i. e., in one to four days, in 14.5 per cent. of cases. Prompt suture—within forty-eight hours—was successful in eighty per cent. of the cases; delayed suture, after transportation of selected wounded cases to hospitals at the rear, in ninety-three per cent. Suture after forty-eight hours was successful in 64.5 per cent. Secondary suture, after Carrel disinfection, was successful in ninety per cent. These excellent results are ascribed not only to the improved methods of treatment, but also to perfect cooperation of the various units and hospitals and to careful selection and rapid transportation of the wounded.

Röntgen Examination of Fractures.—Seth Hirsch (*American Journal of Surgery*, March, 1918) says the advantages of x ray examination might be stated as follows: It permitted diagnosis of those fractures in which there was no displacement of fragments and in which the classical clinical signs could not be obtained, as for instance in fractures of the carpal or tarsal bones, the tibial head, fractures of the posterior part of the internal malleolus of the tibia, interosseous, in fissure fractures of the skull, in incomplete fractures of long bones, in periosteal, and in sprain fractures. It permitted the diagnosis of lesions in bones which were palpated only with difficulty, such as the ribs under the scapula, the coracoid process, the pelvis and vertebrae, the radial head, the neck of the femur. It gave such information regarding direction, variety, and number of fracture lines, shape and size of fragments, as could not be obtained by any other examination. It simplified the differential diagnosis between diaphyseal fractures and epiphyseal separation. This was important because of the disturbance in growth which might follow epiphyseal separation. The frequent occurrence of fractures of the diaphysis was at one half to three quarters above the epiphyseal line and made the differential diagnosis by clinical means impossible. If the separation was slight, the tear in the periosteum of the diaphysis gave the clue. An excellent rule in an injury about the joints in children was to take both sides for comparison with the same technic. This may obviate the necessity of waiting in some cases for the callus formation to disclose the presence of a fracture. It gave information regarding pathological conditions in which the complicating fracture might be the first manifest indication of such disease, as in benign or malignant tumors, fragilitas ossium and Paget's disease.

Respiratory Training by the Spiroscopic Method in Wounds of the Thorax.—J. Pescher (*Bulletin de l'Académie de médecine*, February 19, 1918) finds the spiroscopic method of great therapeutic assistance in cases of insufficient respiratory capacity the result of a chest wound. In the milder cases the method saves much time by accelerating the return to a serviceable breathing capacity. Before instituting the treatment the surgeon should first thoroughly examine the case to find out the mechanical resisting power of the lung parenchyma. The breathing capacity is then measured, and the subject at once becomes interested, noting how much breathing capacity the injury has caused him to lose and how much he must regain. On the first few days the breathing exercises are not carried to the full capacity existing at the time, but are merely educative in purpose. The patient inspires through the nose as much air as he can without forcing or fatigue, then blows out slowly into the spiroscope up to a predetermined moderate volume. Thirty such respirations at intervals of a few seconds constitute a sitting, which is carried out two or three times a day. Results are perceptible from day to day, and in one instance even the breathing capacity was doubled in two weeks. As soon as the qualitative breathing exercises have served their purpose, quantitative training is begun to amplify the respira-

tion. This is divided into athletic exercises, carried to the full extent of the existing breathing capacity, and the intensified exercises, executed while resistance to insufflation is offered by partial closure of a cock connected with the apparatus. Spiroscopic training is also recommended in narrow chested children with poor respiration, whose breathing capacity is doubled in five weeks, with corresponding general improvement; in subjects predisposed to tuberculosis, who always show a subnormal breathing capacity; in patients suffering from impaired oxygenation coupled with anemia, autointoxication, or nervous depression, and in cases of bronchitis and emphysema, which generally regain fifteen to twenty-five per cent. of their lost respiratory capacity after a month's treatment.

Repair of Complete Rectovaginal Lacerations.

—Irving S. Haynes (*Annals of Surgery*, April, 1918) emphasized the following steps in repairing complete rectovaginal lacerations. To begin the separation of the rectum from the vagina just above the levatores ani and in the space between the rectovaginal fascia and the rectum. To separate the bowel downward through the anal canal and cut through the mucocutaneous junction and to carry the mobilization of the bowel upward high enough to obtain sufficient sound rectum so that the undamaged rectum might be drawn beyond the level of the skin. To divide the anococcygeal tissues sufficiently far toward the coccyx to permit suturing the retracted sphincter ani externus in front of the rectum. To rotate the rectum through ninety degrees and suture it in place, especially reforming the attachments of the levatores ani to the bowel. To trim off the excess of rectal tissue and suture the skin to the rectal mucosa and drain the region behind the rectum, the operation being completed by a perineorrhaphy.

Physician and Nurse in Tuberculosis Work.—

John B. Hawes (*Boston Medical and Surgical Journal*, March 21, 1918) says that in an idealized plan for controlling tuberculosis the following factors should play important parts: Elimination of sources of infection, both human and bovine. Education of the public, and particularly of children, in methods of right living and proper hygiene. Early diagnosis of clinical tuberculosis disease in adults and children. Sanatorium treatment for the education and care of favorable and suitable cases. Hospital treatment for the care and isolation of advanced, progressive cases. Supervision of the tuberculous patient before and after leaving an institution, and at all times if the patient does not, or can not, have institutional care. Each of these factors is discussed. As regards the first, the elimination of bovine sources of infection is largely a state or administrative problem, but when there is any question as to the cleanliness of the milk supply the physician may well advise pasteurizing the milk and the nurse can give instructions how to do it. The elimination of human sources is more difficult, but much can be accomplished by the strict investigation of the families of patients. The physician has a definite responsibility to instruct the parents of the children, and the children themselves, concerning the methods of right living and hygiene, while the opportunity for the

nurse to do good in this direction is almost unlimited. The early diagnosis of clinical tuberculous disease is a subject in which sanity and common sense are much needed. One must make a distinction between tuberculous infection which most of us have, and tuberculous disease which most of us have not. Hawes says that he is constantly unmaking diagnosis of consumption and trying to overcome harm done in this direction, while on the other hand too many cases of incipient pulmonary tuberculosis are still unrecognized. His experience with the tuberculosis problem as a whole has led him to feel that home treatment can not, and should not, take the place of sanatorium treatment among the poorer classes, if the latter is in any way available. He believes that every tuberculous patient, as far as it is possible, should, at some time, have sanatorium treatment, but the patient's sojourn in a sanatorium should be looked upon as an incident of great or less importance in a course of treatment, the most important parts of which come before his entrance and after his departure from the sanatorium; the responsibility of the physician and nurse does not end when the patient is admitted to a sanatorium or hospital.

Action of Tyramine on the Circulation in Man.

—Albion Walter Hewlett (*Archives of Internal Medicine*, March, 1918) notes that tyramine, a hydrochloric acid salt of parahydroxyphenylethylamine—the most active blood pressure raising constituent in watery extracts of ergot—is like epinephrine in apparently acting only on such muscle fibres and gland cells as receive a sympathetic nerve supply. There are certain qualitative differences in the action of these two substances, however, Baehr and Pick having found that while epinephrine causes dilatation of the bronchi, tyramine causes constriction. On the bloodvessels epinephrine produces a much greater local effect, and tyramine has no value as a local hemostatic. In Hewlett's clinical tests, tyramine was given subcutaneously in doses of from forty to eighty milligrams, the usual dose being sixty milligrams. The most striking circulatory changes which resulted were: an increase in the systolic blood pressure, the pulse pressure, and the volume pulse in the arm; slowing of the heart rate, and an increase in the size of T in the electrocardiogram, with occasional extrasystoles. The increase in pulse pressure appears to be due mainly to an increased output of blood with each ventricular systole. In addition to becoming larger, the arm pulse, if altered at all in form, is more sustained. The result of comparative studies with epinephrine likewise showed an increase in this product. With this agent, however, injected subcutaneously, there was evidence of vascular relaxation. The diastolic blood pressure usually fell, and the arm pulse, while usually larger, often showed a collapsing tendency, as under nitroglycerin. This view that epinephrine subcutaneously usually relaxes the bloodvessels, particularly in the arm, is in accord with recent animal experiments indicating that in small doses it may reduce the blood pressure and that in appropriate amounts it dilates various vascular areas, particularly those supplying the voluntary muscles and the intestines.

Biological Aspects of Dementia Præcox.—F. W. Langdon (*American Journal of Insanity*, April, 1918) reminds us that the importance of dementia præcox may be estimated when we realize that one fifth of the total discharges from the United States Army are for mental disease and more than half of these are dementia præcox cases. The disease is equally prevalent in foreign countries. Langdon postulates that the efficiency in the struggle for existence of races and nations will be adversely affected in proportion to the mentally deficient of all types contained in their population and of these dementia præcox is the most important, hence a nation's future may be said to depend somewhat upon the frequency of dementia præcox among its people. There are three views current in regard to the underlying processes of this disease: A toxin of specific character; an inherently defective organism; a psychogenetic cause. There are certain structural and physiological atavisms commonly found in dementia præcox patients seemingly indicative of biological defect, thus: the "simian hand" of Stoddart; the "præcox hand shake" of Kraepelin; and the "ancient Egyptian attitude" of Steen. In treating these patients, however, we must bear in mind all three of the theories mentioned above. We must remove the patient from the scene of his psychic conflicts and maladjustments, in other words, place him in a hospital to improve his general condition to the utmost and institute occupational and diversional therapy.

Radium in Cancer of the Lip.—Henry H. Janeway (*Journal A. M. A.*, April 13, 1918) points out the favorable nature of cancer of the lip, so far as either radium or operative treatment is concerned, on account of the frequency with which early diagnosis can be made with certainty. Of six patients treated with radium prior to 1916, four had superficial lesions only, and two showed considerable submucous infiltration. One of the superficial cases has not been traced to date, but was apparently healed when last seen. The other five have all been traced to 1918, and in one there was a recurrence two years after radium treatment. This was one of the patients with deep infiltration, the recurrence taking place in the lymph glands, but not locally at the site of the original growth. The other four patients are still free from the disease. In the past year eighteen more cases have been treated with radium, with favorable immediate results in all. The ultimate results remain to be seen, except in one patient, who died a year following the treatment from extensive metastases in the cervical glands. The results so far obtained seem to justify the continued use of radium in the treatment of operable cancer of the lip, especially as its use eliminates the extensive loss of tissue and the production of marked oral deformities. The agent should be used in the form of emanation, enclosed in silver tubes 0.5 mm. thick, and embedded in dental compound to the depth of five mm. The dose for ordinary lesions should be sixty millicurie hours. The use of the emanation instead of the element provides for easy uniform distribution, as a number of small tubes can be employed, which is not practicable with the element.

The Menace of Venereal Disease.—William H. Newcomb (*International Journal of Surgery*, February, 1918), concerning the treatment of venereal disease, says mercury is still the sheet anchor, the basis of antisyphilitic therapy. The ideal treatment for syphilis is the judicious combination of mercury and arsenic, and it may be affirmed that the more intensive this treatment the better response on the part of the syphilitic process. The person should also be periodically examined, and have the blood subjected to the Wassermann test at definite periods. The iodides may be used, indeed, may be regarded as practically indispensable in all stages of the disease. They are, or appear to be, the only drugs which have any direct influence upon fibrous tissue, and seeing that the syphilitic process is essentially chronic at any stage of its active course, it follows that the aftermath of the lesions will be in the nature of a fibrosis.

The Reception, Examination, and Care of New Admissions.—Robert Armstrong Jones (*American Journal of Insanity*, April, 1918) thinks the early treatment of the insane is the key to success. Every insane hospital should possess a reception building especially designed and equipped with diet kitchen and hydrotherapeutic equipment. The nursing service should be of the highest grade obtainable. Immediately on admission a mental examination should be made sufficiently complete to determine whether or not suicidal or homicidal ideas exist or acute physical conditions requiring attention. The nursing notes should be frequent and thorough. The laboratory test should be done without delay, and the case presented before a meeting of the staff at an early date. In treating a new admission the general condition should be improved as much as possible, daily exercise and hydrotherapy should be utilized extensively and the patient encouraged to occupy himself. If the patient is discharged, the physician's interest in him should not cease, but he should help him to readjust himself to the outside world.

Artificial Respiration in Asphyxia Neonatorum.—Clarence L. Heald (*Journal A. M. A.*, April 13, 1918) draws attention to the many serious objections to the practice of mouth to mouth insufflation, and describes a very simple and cheap apparatus for artificial respiration in asphyxia of the newborn. It consists of an ordinary rubber syringe bulb, which is connected through a Y tube to a small helmet shaped face mask. The other branch of the Y tube is fitted with an ordinary toy rubber balloon, which has an expansile tension of only about eight millimeters of mercury. At the face mask is a spring valve, pressure on which allows the air to flow. This is controlled by the operator's index finger. The infant's mouth should be cleared of mucus, and the trachea cleared by aspiration through a catheter before the mask is applied. The mask covers the mouth only, and is held in place by the operator's hand, which also alternately compresses and releases the infant's nostrils and the spring valve, thus filling and emptying the lungs at any desired rate. The balloon prevents the overdistention of the alveoli by its low tension, and supplies a fairly constant flow of air.

Treatment of Acute Joint Infections.—John W. Churchman (*Journal A. M. A.*, April 13, 1918) emphasizes the fact that it is useless to try to apply any antiseptic to the lining membrane of a joint with the hope of its reaching and penetrating the cells of the membrane until complete mechanical cleansing has been carried out. An apparatus is described and illustrated, by which such mechanical cleansing of the interior of a joint can be accomplished through a cannula of fairly large size. After local anesthesia of the skin, the trocar and cannula are inserted into the joint and its contents aspirated. The joint is then distended with a weak solution of procain, which is withdrawn after a few minutes, then thoroughly washed with sterile salt solution until the washings return clear, when a 1:1,000 solution of gentian violet is forced into it and left for five minutes, to be replaced by a small amount of a 1:10,000 solution of the dye, which is left in the joint. Before the lavage with the salt solution is completed, diluted hydrogen peroxide may be used to break up any thick pus which may be present. The lavage may have to be repeated two or more times at intervals, depending upon the results secured. In a series of cases of acutely infected knee joints the results of this plan of treatment have been very good, and normal function has been promptly restored. Gentian violet is used as the antiseptic because of its marked selective action on pyogenic organisms, especially the streptococcus, and because of its power of penetrating into the infected tissues.

Mercuric Chloride Poisoning.—W. D. Sansum (*Journal A. M. A.*, March 23, 1918) records a series of experiments on dogs to determine the value of diuretic measures in the treatment of mercuric poisoning. He determined that the fatal dose of mercuric chloride could not be definitely established for oral or subcutaneous administration on account of the various factors which entered to interfere with the absorption of the drug. By intravenous injection a fairly uniform minimal lethal dose could be fixed. This was four milligrams per kilogram of weight. This amount did not cause anuria, while five milligrams almost always did. These doses corresponded very closely with the smallest recorded fatal doses for man. The various methods of treatment included the production of colossal diuresis by continuous intravenous injection of glucose, or glucose and Ringer's solution, intravenous injection of Fischer's hypertonic solution, and the administration both intravenously and orally of sodium phosphite according to Carter. The results of these experiments led to the conclusion that there was no valid experimental basis for the belief that copious diuresis enhanced the chances of recovery from bichloride of mercury poisoning, and that the combined methods of treatment which included sweating and purgation as well as diuresis probably owed what effects they had to the latter factor. The experiments made it seem very problematical whether any form of treatment yet employed was capable of saving life if once the fatal dose of bichloride of mercury had been absorbed and had passed into the tissues. The two most promising methods of treatment seemed to be the

mechanical removal of the poison from the alimentary tract and antidoting the poison before it passed through the portal circulation into the general blood stream. The experiments seem to have been borne out by the results in a case in man, subjected to similar treatment after the completion of the animal studies.

Methods of Control of the Clothes Louse.—William Moore (*Journal of Laboratory and Clinical Medicine*, February, 1918), found that sachets could not be used with success. A powder made of creosote, one c. c., sulphur 0.5 gram, and talc twenty grams is effective, but because of the expense of the great amount which would be needed to do the work thoroughly, is out of the question, except as a supplementary control measure. Impregnation of the underwear does not seem promising, though it might be possible for a cheesecloth suit impregnated with saturated solution of sulphur in creosote to be worn outside the underwear. The use of chlorpicrin as a fumigant is advocated. It penetrates the clothing and kills lice in all parts of the clothes in fifteen minutes, and the eggs in thirty minutes, which time might be reduced by increasing the heat in the fumigation chamber.

Sutureless Skin Sliding Method.—Emil G. Beck (*Surgery, Gynecology, and Obstetrics*, February, 1918) advises the following procedures for the radical treatment of lung abscess and chronic osteomyelitis: The methods of primary sterilization by means of aqueous flushings of wounds should be thoroughly tested to determine whether or not they were effective and practical without the additional use of pastes. That the wide excision of tissues as now practised in war hospitals should be adhered to as a means of preventing chronic suppuration. That in cases in which early sterilization was not obtainable and the wounds persist in suppurating, the bismuth injection treatment or its substitutes should be employed before any radical operation was resorted to. In the cases in which the bismuth treatment was not effective, the sutureless method of skin sliding should be employed, since with this method we were able to clear up nearly all of these apparently hopeless cases.

Pituitary Extract in Bowel Paralysis Following Appendectomy.—E. Kirmisson (*Bulletin de l'Académie de médecine*, January 29, 1918) reports good results from pituitary extract in the cases of intestinal paralysis frequently following operations for acute appendicitis in the presence of general peritonitis. In some of these cases intestinal paralysis is the only manifestation of the peritoneal inflammation, and at times the impression arises that the patient's life could be saved if only the intestinal paralysis were overcome. In a case of gangrenous appendicitis in a child of ten years, with marked abdominal distention and absence of bowel movements for six days after the operation in spite of gastric lavage, enemas, and castor oil suppositories, a first subcutaneous injection of one mil of pituitary extract brought colicky pains and a small stool within fifteen minutes. Further injections on subsequent days were promptly followed by increasingly copious bowel movements, and recovery took place.

Miscellany from Home and Foreign Journals

Albuminuria and Nephritis.—H. Baril (*L'Union médicale du Canada*, April, 1918) presents clinical evidence showing that absence of albuminuria must not be taken as definitely excluding a diagnosis of chronic nephritis where the symptoms or arterial pressure favor such a diagnosis. In such cases resort must be had to other diagnostic methods, such as the study of Ambard's coefficient, and great care must be taken in observing the patient. Urine containing but a trace of albumin not infrequently proves misleading, the renal disease turning out to be more grave than one has been led to believe it. Where the amount of albumin passed diminishes in the course of nephritis, the improvement should be estimated rather from the patient's general appearance, the symptoms, the blood pressure, and the Ambard coefficient or blood urea estimation, the albumin, as a matter of fact, constituting no measure of the functional efficiency of the kidneys.

Relationship of the Internal to the External Body Temperature.—A. Satre, writing of diagnostic and prognostic indications (*Paris médical*, March 9, 1918), found in 1,000 temperature readings, carried out in 500 subjects, including forty normal individuals, a customary average difference of 0.3° C. in favor of the internal temperature, both among normal subjects and in ill persons in whom some disease was running its ordinary course. A difference less than 0.1° or exceeding 0.5° is abnormal, and indicates that the disease is running an unusual course. Where the difference, at the start of an illness, rapidly rises to 1° , Satre makes an unfavorable prognosis, and where it increases and attains or exceeds 1.5 or 2° , the prognosis is fatal. If the difference at the start is 0.8 to 1° and subsequently does not increase, there is some hope of recovery, but with prolonged convalescence. A marked difference in acute infections often indicates insufficiency of the myocardium due to acute degeneration. Where the difference attains 1° , the author begins to give stimulants and discontinues cold baths or packs. A normal difference suggests that the heart is in good condition, in spite of unconsciousness, delirium, and a frequent and at times arrhythmic pulse. Development of an abnormal difference during convalescence from diphtheria indicates acute insufficiency of the myocardium. In chronic heart disorders the difference frequently reaches 1° to 1.5° , and if it further increases progressively, the prognosis becomes less favorable. A difference of about 1° permits of distinguishing cardiac from bronchial, renal, or emphysematous asthma, for in the latter forms of asthma the difference ordinarily remains normal or may be nil. An abnormal difference, often very pronounced, is met with in disorders involving the peritoneum, such as appendicitis. A normal difference in a nervous woman who, after labor, develops vomiting, rapid pulse, and abdominal pain and distention, excludes peritonitis. A normal difference in the presence of signs of appendicitis should lead one to seek elsewhere the cause of the symptoms. An abnormal difference—not exceeding 1° , however—is met with in all suppurative affections, internal or external.

General Loss of Reflexes after Wounds of the Skull.—S. G. B. B. (*Bulletin de l'Académie de médecine*, March 5, 1918) has seen five cases in which a wound of the cranium was followed by abolition of all or nearly all the tendon reflexes. None of the signs ordinarily accompanying loss of reflexes, such as pain, anesthesia, hypotonia, motor incoordination, paralysis, etc., were present in these cases. The loss of reflexes might easily have been overlooked—a circumstance indicating the advisability of examining for the reflexes in all cases of skull injury. The reflexes were probably lost very soon after the injury, during the acute stage of traumatic meningitis. In at least one case the reflexes have remained absent for two years, and they will probably have been permanently lost. In no case was there a history of any disorder causing general loss of reflexes, e. g., toxic or infectious multiple neuritis, anemia, cachexia, tabes, etc. In all instances evidence of an actual, though usually mild, traumatic meningitis is available. Lumbar puncture several months after the beginning of the disturbance showed high pressure and excess of albumin in the spinal fluid. The cause of the loss of reflexes is doubtless some change in the posterior roots—in the so called radicular nerve—due either to the traumatic infectious process, to the increased intraspinal pressure, or to both of these conditions.

Coxa Vara and Obesity.—E. Kirmisson (*Bulletin de l'Académie de médecine*, March 5, 1918) includes, under the term coxa vara, two abnormalities, viz., a special morbid posture of the lower extremity characterized by a combination of external rotation with adduction, and a sagging of the femoral neck, which forms a right or acute angle with the shaft of the femur. Thus defined, coxa vara occurs under two different conditions: in young children, in whom it is generally accompanied by the other customary signs of rickets, and in adolescence, when, as in the case of the other skeletal deformities met with at that time, it usually occurs alone. As regards the cause of the adolescent type of coxa vara, the author was struck some years ago by the observation of a family in which three children had coxa vara and were all obese. The mother likewise suffered from obesity. Numerous cases since met with have convinced him of a close relationship between obesity and not alone coxa vara, but also epiphyseal separation at the upper end of the femur and the local disturbance which leads to "fruste" coxalgia. The three latter conditions, moreover, are themselves allied, sometimes occurring in association in several members of the same family. Thyroid insufficiency is probably the cause of the obesity underlying these conditions. The thyroid gland seemed hypoplastic in the author's cases, and the pasty features and facial puffiness suggested myxedema. X ray examinations for pituitary enlargement in two cases were negative. In a male patient aged sixteen the genitals seemed underdeveloped, and in a girl of thirteen the breasts tall and weighing 61 kilograms, menstruation had not yet appeared. Treatment by mechanical extension and thyroid gland internally yielded some benefit.

Relation of Blood Pressure to Convulsions.—D. M. Ervin (*Journal A. M. A.*, April 27, 1918) says that there is some factor in the course of a convulsion which brings it on and again stops it, and that the fact of the convulsion's stopping is an argument against the idea of an accumulation of a chemical substance as the cause. The blood pressure is known to be a function of the intracranial pressure and to vary directly with it in height. Normally there is a factor of safety, measured by the excess of the blood pressure over the intracranial pressure. When the margin of difference between these two declines to zero or to a negative quantity the brain receives an insufficient supply of blood. This leads to changes in the brain, the vasomotor center is depressed and the blood pressure falls further, the pupils dilate, and a convulsion begins. The muscular activity during the convulsion leads to an elevation of the blood pressure, blood is again sent to the brain, the centers return to activity, and the convulsion passes off. These observations are illustrated by the detailed records of four patients who had repeated convulsions, there being a sharp fall in blood pressure just preceding each convulsion and a rise during and following each. Relief, to be permanent in such cases, should include some measure designed to reduce intracranial pressure.

Blood Sugar Tolerance Test.—N. W. Janney and V. I. Isaacson (*Journal A. M. A.*, April 20, 1918) point out the defects and disadvantages of the usual methods of testing sugar tolerance and describe an improved technic. The patient is made to fast from 7 p. m. until the test is finished on the following morning. In the early morning his blood sugar is determined and he drinks a solution of absolutely pure glucose of such strength that there are ten mils of water for each four grams of glucose. The amount given is 1.75 grams of glucose for each kilo of the patient's body weight. Exactly one and two hours after the glucose was taken determinations of the blood sugar are made. If the sugar tolerance is normal there is a difference not exceeding 0.01 per cent. between the second hour's determination and that on the fasting blood. If there is decreased tolerance the second hour's determination will show a persistent hyperglycemia, which may be determined further by subsequent hourly measurements. The fasting sugar level indicates the presence of either hyp- or hyperglycemia. A twenty-four hour specimen of urine, begun at the ingestion of the glucose, is also examined for the occurrence and amount of glycosuria. The blood sugar test is made by Epstein's micromodification of the Lewis-Benedict method and the blood is readily obtained from a puncture of the finger tip. The test is of value in diabetes, nephritis and disturbances of the endocrine glands. In diabetes it is of special value in the doubtful and incipient cases. Renal diabetes shows normal blood sugar value, normal tolerance curve and definite glycosuria. In chronic interstitial nephritis the blood sugar tends to remain at or above the normal upper limit, while there is a delayed fall after the tolerance test and an absence of glycosuria. Hypofunction of the several endocrine glands means a delayed fall in the blood sugar curve in the tolerance test.

Clinical Features of Syphilis Among the Moroccan Natives.—Lacapère (*Presse médicale*, March 18, 1918) reports clinical observations, relating chiefly to tertiary syphilis, in the native population of Morocco, in which the disease usually remains untreated. He presumes that, before the introduction of proper therapeutic measures into Europe toward the close of the Middle Ages, the manifestations of the disease were similar to those now met with in Morocco. At a dispensary in Fez there were treated in nineteen months 609 natives with tertiary lesions, but only 167 with secondary, and twenty-eight with primary. Among the 609 tertiary cases, no less than 835 tertiary lesions of separate forms were met with, i. e., multiple lesions of the same variety in a single patient are not caused in this figure. Over sixty-five per cent. of the patients had multiple tertiary lesions, as against only ten per cent. among European tertiary cases, according to Fournier. This does not imply, however, unusual malignancy of the disease, for the lesions among the natives yielded very readily to even the mildest treatment, including potassium iodide. That the disease in Morocco is actually benign seems probable owing to the absence of alcoholism—known greatly to aggravate syphilis—and of mental strain, late hours, and exciting influences of all kinds; and likewise, from the possibility of a partial immunity in view of the fact that seventy per cent. of the entire population is infected. Skin and bone lesions were very numerous. Nervous involvement in late syphilis was, on the other hand, strikingly uncommon, occurring in only five per cent. as against over thirty per cent. among Europeans, according to Fournier. Specific tertiary nervous lesions were very infrequent, most of the nervous cases merely having vesperal headaches without definite signs of organic involvement. Not a single case of tabes or paresis was observed among the Moroccans, though two individuals originally from Algeria had tabes. The infrequency of nervous syphilis is ascribed mainly to the absence of intellectual strain among these natives, though sexual excess is perhaps more prevalent than among Europeans. Paresis in Europe is known to occur almost exclusively among subjects with relatively great intellectual activity. Other reasons for the discrepancy are the fact that the natives generally contract syphilis at an early age—secondary manifestations frequently being met with in young children—and that the mode of application of mercurial treatment in European countries tends to favor nervous involvement, being too often carried out merely for the immediate relief of definitely appreciable, e. g., cutaneous, lesions, and actually driving the virus to the more inaccessible nervous tissues. Another difference between European and Moroccan syphilis is that whereas, in the former, tertiary lesions usually appear only after a long free interval, and, likewise, recur at prolonged intervals, among the Moroccan natives there is a gradual transition from the secondary to the tertiary manifestations and periods of freedom from symptoms do not occur. This is attributed to the entire lack of treatment, which, as a rule, is sought only when severe complications entailing danger to life have supervened.

Proceedings of National and Local Societies

NEW YORK ACADEMY OF MEDICINE.

Stated Meeting, Held February 7, 1918.

First Vice-President, Dr. GEORGE D. STEWART, in the Chair.

The program of the evening was furnished from the Camp Upton Base Hospital, MAJOR J. WHITHAM, commanding.

Classifications and Results of Treatment of Pneumonia at Camp Upton.—Dr. RUSSELL L. GLEN, illustrated his address with charts, comparing the incidence of pneumonia in civil and military life, and confined his remarks largely to generalizations gathered from a study of one hundred cases of pneumonia at Camp Upton. The health conditions at the camp had been unusually good, but there had been an increase in the morbidity upon the arrival of colored troops from the South. With only one case in October and four in November, in December there were forty-seven, and in January forty-six. The number of colored troops was ten per cent. of the whole number of men in camp, yet fifty per cent. of the one hundred pneumonia cases occurred among this ten per cent. A number of them were secondary to measles, seventy-five only of the one hundred being primary, nineteen following measles, four mumps, one German measles, and one scarlet fever. Six of these were streptococcus pneumonias. The large percentage among the colored troops was explained by the fact that they had come from a warm climate and also by their having passed through a place where measles was epidemic.

A comparison of the classification of the pneumonias between an equal number of cases at the Rockefeller Institute and the one hundred cases at Camp Upton showed that while at the former 94.5 per cent. were due to the pneumococcus, only 67.7 per cent. showed this at Camp Upton, 24.7 per cent. being streptococcus infection, 2.2 per cent. influenza bacillus, 5.4 per cent. staphylococcus catarrhalis, the latter not being among the Rockefeller Institute cases. But among these latter, 0.6 were Friedlander infection and 0.6 staphylococcus aureus, while these were negative at Camp Upton.

The incidence of the four pneumonia types at Camp Upton was 27.0 per cent. of Type I, 12.7 per cent. of Type II, 9.5 per cent. of Type III, and 50.8 per cent. of Type IV. Comparison with an equal number of cases at Rockefeller Institute showed that there 33.0 per cent. were Type I, thirty-one per cent. were Type II, 12.0 per cent. Type III, and 24.0 per cent. Type IV. The methods used in classifying the groups were the mouse inoculation method which was used in seventy-one instances, and the precipitin and agglutinin method of Avery, used at the Rockefeller Institute. The blood broth was used in six cases and both methods in the others. The average duration of Type I was seven days, of Type II, six and a half; of Type III, six, and of Type IV, six and a half. Type IV, usually considered a mild type, occurred in a larger number of cases than it did in civil life, and they were more severe. An unusually large number of cases were due to the streptococcus, but the duration was

shorter, averaging five and a half days, and they ran a severe course, often complicated by empyema. Influenza and staphylococcus aureus cases ran an irregular course and few were severe. One fourth of the streptococcus cases were hemolytic. Only twenty-six per cent. of these cases occurred among the secondary pneumonia cases, twenty per cent. of these being among the bronchopneumonias and eighty per cent. lobar pneumonias.

The mortality rate at the Rockefeller Institute for the different types was as follows: Type I, 25.0 per cent.; Type II, 32.0 per cent.; Type III, 45.0 per cent., and Type IV, 16.0 per cent. At Camp Upton the figures were: Type I, 5.8 per cent.; none from Type II, though of average severity; Type III, 16.6 per cent., and Type IV, 18.7 per cent.

As to the serum treatment, the Government supplied two kinds, a Type I and a polyvalent serum which proved chiefly potent against Type I, and which was tried out against all the pneumococcus pneumonias the first part of the year. The maximum number of serum injections was six, but they averaged a little over two. The serum was given by the gravity method and was employed in three fourths of the cases. Of the Type I cases, one hundred per cent. received serum, and so did this percentage of Type III; of Type II cases, eighty-five per cent. received serum and 68.7 per cent. of Type IV. One half a cubic centimeter of normal horse serum was given subcutaneously several hours before the injection of serum to avoid anaphylaxis. In many of the streptococcus cases following the serum there was a marked drop in temperature, but it went up again in contradistinction to the pneumococcus pneumonias, where the temperature, having fallen, remained low.

As to complications, there was serofibrinous pleurisy in many cases and empyema in fourteen, it being twice as prevalent among the streptococcus pneumonias as among the pneumococcus. Pneumococcus septicemia occurred in several cases, and there were a few relapses. Serum sickness occurred in about one fourth, manifesting itself with rise in temperature, urticaria, acute arthritic pains, and a general feeling of discomfort; it lasted only twenty-four to forty-eight hours. There were two cases of acute anaphylaxis, one of which was fatal. They were Type III, lobar pneumonia. The first patient showed no effect of the preliminary subcutaneous injection of horse serum, the distressing symptoms following the intravenous injection of the serum and lasting twenty minutes before he went on to recovery. The preliminary injection of horse serum had no effect on the second patient, and neither did the first dose of antipneumococcus serum, but he was given a second dose during a relapse two weeks after the first, which was too long an interval to intervene, and additional precautions should have been taken against hypersensitiveness; he became cyanotic, exclaimed that he felt dizzy and could not breathe, pulse became rapid and thready, and he suddenly died.

Out of one hundred cases the mortality was only

fifteen, which represented fourteen per cent. of the white troops and sixteen per cent. of the colored. Seven of the fifteen were streptococcus pneumonias; out of the seven, five were complicated by empyema. Of the other eight, six were due to Type IV. Three were due to empyema, one had the morphine habit, one died of acute nephritis, one had Hodgkins's disease, and one had parenchymatous nephritis.

The lessons to be learned from these cases were: To type all cases, for it was an advantage to know with which type one was dealing; give serum to all Type I cases, for it was of great benefit; this would be shown by the drop in temperature and the subsidence of the symptoms. In streptococcus cases empyema should be guarded against; as pus and streptococcus were found, incision should be made and free drainage established. The surgeon should be on his guard against complications.

Measles from the Standpoint of Military Medicine.—Dr. F. J. HACKETT, in charge of the contagious wards, of the Camp Upton Base Hospital, read this paper. Measles had been defined as an acute, highly contagious disease of the upper air passages and skin, but it should be classified as an acute disease of the respiratory passages, developing from close association and more common in the winter months, the period of lesser ventilation. It was infrequent in rural or sparsely settled communities, but was endemic in cities. For these reasons measles was a large problem in army cantonments. The conditions which appeared to play the most important rôle in its spread and control were two: character of camp strength, whether urban or rural, and early recognition with prompt and efficient methods of sanitation such as inspection, quarantine, isolation, and hospital treatment.

In the northern camps measles was not reported until after the onset of the colder weather of November, and the measles admissions were highest in those camps having a larger population of former residents of rural or farming communities, who are extremely susceptible. In some camps the number was as high as 500 in seven days. At Camp Upton, subsequent to November 1st, 1917, which also marked the arrival of colored troops from farming districts of the South, the measles admissions rate took a sudden rise.

There was early recognition of these cases and efficient methods were immediately instituted of sanitation, inspection, isolation, and quarantine by the Division Sanitary Inspector. Reports reached him of exposure to measles of arriving troops en route to Camp Upton. They were immediately inspected and the first case sent to the isolation ward of the base hospital, the barracks where the soldier was quartered being put under quarantine. Suspects were sent to the measles observation ward. Later, troops arriving from measles infected camps were inspected before the men detained. The general precautions consisted of the following orders: all barracks aired for two hours morning and afternoon, and bedding exposed to air and sun for the same length of time, or together with the clothing of the men exposed to formaldehyde vapor for thirty-six hours and then thoroughly aired. The

common towel and drinking cup were prohibited, all eating utensils were thoroughly boiled after each meal, and personal cleanliness was urged on the men. The Y. M. C. A. hut was closed and the Post Exchange allowed to serve only two men at a time to avoid the usual crowding of these popular meeting places. No visitors were allowed at the regimental infirmaries. Cases developing in the wards of the base hospital were sent to the isolation pavilion and the ward quarantined for two weeks, as well as the organization to which the patient belonged and from which he was admitted.

Careful inspection of suspects was held twice daily, the eruption and Koplik's spots being especially looked for, though they were never seen, leading to the conclusion that their absence possessed little significance in the adult negro. The white soldiers were relieved from quarantine if they gave a previous history of measles, but this was not considered of value in the case of the colored soldiers, as many as sixty per cent. of the cases among them having given such a history. There had been so many cases of post measles complications, including pneumonia, that on December 10th, 1917, the Surgeon General's Office ordered measles cases held for two weeks longer than the usual two weeks in hospital. On January 1st, 1918, screens were placed between each two patients to prevent droplet infection during coughing. All the cases were treated in well heated and well ventilated hospital wards. Medical officers, nurses, and attendants were gowned, capped and masked, and the hands disinfected. Approximately 750 cubic feet of air was allowed each patient. Nasal discharges were collected and burned, as well as the sputum cups. Floors of wards were gone over daily with a disinfectant. The medical treatment was purely symptomatic, and a close watch was kept for pulmonary complications.

In all, between September 1st and February 1st, there were sixty cases. The principle symptoms were coryza, pharyngitis, laryngitis and, in one case, acute otitis media developed. Pneumonia followed seventeen cases. When pneumonia developed the patient was removed to the measles-pneumonia ward, where more air space was allowed. The beds here were also sheeted and screened.

The conclusions to be drawn from the study of these sixty cases were obvious. Outbreaks of measles must be looked for and prepared for in all army cantonments whose population is made up of residents of rural districts. When nonimmune troops arrived in a camp whose strength was composed of immune troops, outbreaks of measles might be expected. When they occurred, they were best met by early recognition, prompt isolation, efficient methods of quarantine, and a very painstaking inspection, which should be held twice a day. Measles should be treated in well heated, well ventilated hospital wards. Beds should be screened and post measles pneumonia should be treated as any of the contagious diseases. It was to be hoped that there would nowhere exist failure to understand the seriousness of measles under the conditions necessarily and temporarily existing in some camps. Measles and post measles pneumonia would universally re-

ceive the proper treatment only when isolation wards were built and ready for occupancy at the time of the arrival of the first troops.

Hyperthyroidism in the Recruit.—Dr. HARLOW BROOKS, chief of the Medical Service of the Camp Upton Base Hospital, had always, in civil life, considered hyperthyroidism almost exclusively a disease of women, and particularly of women rather unstable in their youth. One of the greatest medical surprises to which he had been treated since on active service had been the large number of cases which had come under his observation as a member of the Cardiovascular Board of the Seventy-seventh Division and in the medical wards of the Camp Upton Base Hospital. The British had described the same condition as the effect syndrome, or as disordered action of the heart. This group of circulatory phenomena formed an important and inseparable part of that condition known as shell shock, which occurred in many people who not only had not been shocked by shell fire, but particularly among many who most earnestly desired never to be. This circulatory problem was the most important which the war had thus far presented and one of the most frequent disqualifying factors of otherwise available soldier material. That this group of symptoms was due to hyperthyroidism was the prevailing opinion of many clinicians in active service, though many, and notably the British authorities, ascribed it to infection or to an unknown agent so far but vaguely hinted at.

The most striking feature of these cases in nearly every instance was tachycardia, on account of which most of the cases reported to the regimental medical officer, or applied for exemption or discharge. It was constant in practically all examples of the syndrome, though it varied very greatly in degree. It was present alike in recruits presenting themselves for initial examination, and, in those who reported later, army routine might have further served to upset the emotional and circulatory equilibrium. The tachycardia was rarely accompanied by arrhythmia. The pulse rate was practically always increased by exercise, though there were exceptional cases where exercise might slow the rate, particularly when the attention was distracted. Closely associated with the tachycardia was a throbbing of the superficial vessels, notably of the carotids, the brachials, and even the femorals, while that of the aorta, in moderately thin individuals, was also evident. Absolute differentiation of this condition from aortic incompetence was accomplished by the graphic method of polygrams. The heart sounds, because of their rapidity, were usually very difficult to analyze, but in a good many cases a soft systolic murmur was detected at the apex, transmitted at times with decreasing intensity toward the axilla. Everything in the nature of graphic methods seemed to indicate that these murmurs were functional and not organic in origin.

Accompanying these striking signs of circulatory derangement were many symptoms apparently secondary to the tachycardia. The capillary return was almost always delayed and a capillary pulse was simulated. There was oppressive, occasionally

bursting, pain in the region of the heart, areas of hyperesthesia being frequently demonstrable. This pain was sometimes reflected into the left or right arm and shoulder. Sudden and rapidly succeeding flushing and paling of the face and upper thorax occurred. The blood pressure was very low and there was a notably low pulse pressure in most instances. Adrenalin caused an increase of the symptoms and there was also apparently a hypersensitivity to thyroid. The nitrites markedly increased the symptoms and there was a general hypersensitivity to the vasomotor dilators. The tachycardia could not be controlled by digitalis even when given in massive doses. The sedatives at times, notably the bromides, gave marked relief in some instances but were apparently without effect in others. Postural and emotional rest appeared to be the most efficient measures of control. Cold applications to the precordium had no effect.

Very closely associated with the definitely circulatory symptoms were those of dizziness and fainting. Such attacks were directly precipitated by exercise or by emotional stress, for instance such as occurred during a physical examination. Next to the tachycardia, the most striking manifestation was emotional instability, numerous evidences of which were an invariable accompaniment of the disease, such as epileptoid attacks, outbursts of passion, tears, profanity, or perhaps convulsive muscular spasms. Irritability of temper, headaches, and insomnia were almost constant and, during aggressive periods, an intense feeling of fear, apprehension, and terror was manifested. Outbursts of emotionalism were followed by a stage of great exhaustion in which the patient might be so prostrated as to appear in extremis. The neurovascular instability was further shown by the *tache cerebrale*, by *dermographia*, by urticarial rashes, and by the almost constant symptom of tremor, which was most marked in the hands, fine, increased by intention and, though occurring on both sides, rarely synchronous. The types of nationalities chiefly affected by this syndrome were a very certain index of the strong emotional element in the disease, the Hebrews leading, the Italians coming next, then the Irish; it was seen least of all in the negroes.

Breathlessness was manifest at times and there were small variations in temperature. The deep reflexes were excited. The patients had a worried and apprehensive facial expression which was very characteristic. In about two thirds of the cases there was a definite thyroid hypertrophy, in some cases amounting to an actual goitre, the individuals complaining of a choking sensation, though they but rarely described a typical *globus hystericus*. A considerable number of the cases gave an ancestral history of goitre, particularly on the maternal side. There was also, in most instances, a familial history of nervous instability, of hysteria, insanity, perversions, or of genius. Exophthalmos was also present in long standing instances, not infrequently developing very suddenly. Nearly all showed more or less *relaxation of the membrane with a distension of the membrane*. Thus most of the cases presented all the cardinal signs and symptoms of true Basedow's disease. These patients endured the

acute infections very badly. Tobacco produced in them much more serious symptoms than the average and they had a distaste for alcohol. Almost without exception they were rapid and large eaters.

Rest was the factor which mostly relieved these cases, physical rest being the most potent factor and mental or emotional rest second. This was accentuated by the use of bromides or sedatives in either instance. Thus far it had been chiefly a question as to whether or not these subjects had the makings of soldiers in them. Many cases recovered under the really healthful and normal daily routine life of the military camp, particularly those happy in their work, or with a sense of duty and obligation. The subject was an important one at this time. It was very probable that earnest study would permit a considerable and very valuable amount of human material to be salvaged which might be sorely needed before the uniforms could be laid aside and a return made to home and normal life.

Superinfection in Syphilis.—Dr. JOSEPH KLAUDER, in charge of the Syphilis Ward of the Camp Upton Base Hospital, apologized for devoting his paper to some points in regard to syphilitic infection as the time had been too short for him to be prepared to give statistics or facts regarding this disease at the camps. Among communicable diseases, syphilis was of first importance and, though it was a well known fact that an individual who had suffered from it was little liable to contract it a second time, yet it must not be inferred from this that a true immunity was necessarily present. Syphilis was peculiar among infective diseases in the long number of years during which it might remain latent and, in the majority of cases, the patient was apparently immune only because he was still syphilitic.

It was pretty generally agreed by those who had studied the subject, that individuals infected with syphilis were susceptible to a second inoculation or superinfection, not only during the period elapsing between the infection with syphilis and the appearance of the chancre, but also at periods shortly subsequent to the appearance of the primary stage. Contrary to former teachings, a chancre might be autoinoculable. In the writer's analysis of 200 cases of chancre, twenty-four per cent. were multiple; in some of these the second lesion appeared subsequent to the first. In one of these individuals a chancre appeared on the finger three days subsequent to one on the penis. A large percentage of multiple chancres had been reported. After the disease was well established as a systemic infection, that is, in the active secondary period, many investigators had reported unsuccessful attempts to produce reinfection.

The subject of superinfection was an interesting one, from a clinical point of view, and should be considered in the diagnosis of a genital lesion containing the treponemata when appearing in individuals giving a history of having had the disease. If, in such lesions, the treponemata were found in profusion and the Wassermann test was at first negative, later becoming positive, it was evidence in favor of the lesion being a primary sore, that is, a reinfection. If, however, the treponemata were present in scanty numbers and the Wassermann

was positive at the time of its appearance, it was evidence that the lesion was a possible superinfection. Those genital lesions reported as instances of superinfection were papular ulcerative and ulcerating in type, with slight induration.

It was probable that many so called attacks of syphilis, or reinfection, were instances of superinfection. There was, nevertheless, evidence that true second attacks of syphilis might at times occur. By a second attack should be meant the occurrence twice in a patient's life of a primary sore followed by secondary symptoms. If this definition were accepted the phenomenon would be rather rare. It meant not only that the patient had so returned to the normal as to react to the syphilitic virus like a nonsyphilitic, but that he had lost any immunity which might have been conferred by his first attack.

In the differential diagnosis of a genital lesion of the nature here reported, besides reinfection and superinfection, the following possibilities should be considered: Ulcerative processes over foci of syphilitic lymphangitis on the penis might in rare instances simulate a recrudescence of the primary sore, a mucous patch, or an abrasion. In these, however, the treponemata were present in great numbers. Another possibility was a localization of treponemata at the point of lessened resistance as the result of trauma. It was a well known fact that trauma, in a syphilitic subject, was often the determining point for the development of a gumma.

DISCUSSION.

Dr. SIMON BARUCH thought it might throw some light on the subject of Doctor Brooks's paper if he mentioned the fact that in many thousand cases seen in hydrotherapeutic clinics of this city, the same manifestations in the same types of nationalities and of men, as well as women, had come under his observation. It was a matter of heredity, and the intensification of the condition was due to emotional influence in civil life, just as Doctor Brooks described it in military life.

Dr. WILLIAM P. NORTHRUP had been very much interested in this opportunity for studying cases in large numbers and under complete control. He was especially interested in Doctor Hackett's paper in regard to measles, which was a disease he had been trying to keep out of the wards of two hospitals for twenty-five years and he knew how difficult it was. He was anxious to know if the open air treatment had been tried in these army cases. In one epidemic in March with the usually bad weather conditions of that month, the cases were doing very badly in the wards of the Foundling Hospital and Dr. Rowland Freeman, in order to help the patients to avoid the usual infections that follow measles, put the children out in the open air on balconies under tents, even in that bad weather. The results were very much better as compared to those patients not taken out of doors. It was traditional that when measles broke out among the Indians, those affected were sure to die, and it was well known that their way to treat it was to put the patient in a small tent, shut him up, put in a candle and a hot brick and leave him. Contrariwise it seemed to the speaker that the open air treatment should be tried. He appreciated Doctor Hackett's definition of measles as an acute

disease of the upper respiratory passages, and was interested to know if there were not some way to treat measles apart from the old way of keeping the patient in a warm room.

Dr. WILLIAM M. LESZNSKY was impressed by Doctor Brooks's description of these cases. The development of the symptoms of hyperthyroidism was undoubtedly, as he said, primarily due to the emotional elements of fear and anxiety arising in a neuropathic constitution, the thyroid element being of secondary importance. From what had been learned of war neuroses, particularly anxiety neuroses among officers upon whom rested so much responsibility for the safety of their men, one could readily understand how their efficiency would be curtailed by this condition. Excessive fatigability was also a factor in their breakdown. It would be interesting to learn from Doctor Brooks what, in his opinion, constituted the future of these men and if they would be retained in the service.

Dr. HARLOW BROOKS, replying to Doctor Lesznsky, said that as far as he could tell it was unlikely that more than a small percentage of these cases would see field service, but in other branches of the army many of them would be found very useful, the condition clearing up and the symptoms remaining in abeyance under favorable environment.

Dr. J. F. HACKETT, answering Doctor Northrup regarding open air treatment of measles, said that his procedure had been in the opposite direction, all the patients being kept in warmed, though well ventilated, wards. He felt that the low death rate had been because of this. It had been the universal experience of the camp hospitals that measles cases in adults always did better in well warmed wards and the cases of postmeasles pneumonia were low among those so treated.

Book Reviews.

We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.

Lecithin and Allied Substances. The Lipins. By HENRY MANTAN, M. D., D.Sc., Lecturer on Chemical Pathology, St. Thomas's Hospital, London. London and New York: Longmans, Green and Co., 1918. Pp. vii+206. (Price \$2.25.)

To the student of mechanical processes, a visit to a museum or an exposition in which the developmental phases of the evolution of any industrial object is portrayed, such as the printing press, locomotive, ferryboat or what not, is always a subject of great interest and delight. The lay observer catches the high lights in the advanced processes, but the technical student understands how these changes have been brought about, when and why, and to him the whole process seems less mystical or marvelous than to the layman. He is able also to analyze to some degree the intricacies of the advancing patterns as they evolve from year to year or decade to decade, and also to some degree might contribute to the advance of such industrial manufacturing implements.

The human body is such an instrument. Its evolutionary phases have come up from the bacteria to humans. With sixty decades, eras, or whatever one wishes to call them, the new methods of handling cosmic energy have accumulated structuralized forms which we call organs, but only in the final synthesis the human body in all these com-

plexities stands before us. In the interpretation of the mechanisms by which transformation of energy takes place within this human machine—for only transformations can take place—the study of biochemical processes affords the keenest interest. For in these biochemical processes the transformation mechanisms are derived.

From this point of view, the present book is particularly interesting in its attempt to throw light upon a certain group of substances which are capable of utilizing the energy found in the external world in the forms chiefly of nitrogen and phosphorus. Certain combinations of carbon, hydrogen, nitrogen and phosphorus make up the group of substances with which this monograph deals, and the possibilities for energy transformation by the utilization of these substances may be worked out by a comprehensive understanding of the combinations in which the substances themselves are found in the human body. The present day knowledge of the human body as a transformer of energy is in its infancy. We know almost nothing about it. No definite synthesis has ever yet been presented. The average pharmacology, for instance, is an absolute terra incognita, notwithstanding many of the wise bits of humbuggery published in our books on materia medica. Such studies as these tend to reduce the amount of scientific buncombe and it is interesting to know that a certain amount of justification and rather late acknowledgment is made to Thudichum who, twenty years ago, contributed widely to our knowledge of certain of the lecithin substances of the brain. It may be recalled that this same Thudichum was one who wrote a rather interesting dissertation on modern textbooks as impediments to knowledge. We are glad to note, however, that the present monograph is not couched in the average textbook language and recognize certain formulations as hypotheses, and does not mix up biochemical concepts in a mussy faulty logic. Like other works of this sort the present volume under consideration is praiseworthy, but the reviewer would have been interested to have heard more of the function of the lipins, especially from a dynamic point of view. What do they do as energy transformers? That the biological synthesis of the lipins is entirely unknown is to be regretted, but that the present volume may in some measure help to dissolve the mists of our ignorance is to be hoped for.

Blood Pressure in Clinical Medicine. By WILLIAM

NORRIS, A. B., M. D., Assistant Professor of Medicine in the University of Pennsylvania; Visiting Physician to the Pennsylvania Hospital; Assistant Visiting Physician to the University Hospital, etc. Third Edition. Thoroughly Revised. Illustrated with 110 Engravings and One Colored Plate. Philadelphia and New York: Lea & Febiger, 1917. Pp. 448. (Price \$3.50.)

This book offers a very practical working manual for the physician and the medical student. It furnishes a complete good outline of methods for examining blood pressure changes, the diagnostic and prognostic value of this procedure, the variety of meanings which belong to this too loosely used term and the practical significance. The author defines more precisely just what the term and the procedure are in medical practice and describes the forms of pressure which may be ascertained, systolic, diastolic, pulse pressure and so on.

He reviews the subject of normal blood pressure; that of children; the influence upon it of climate and racial conditions; of physical fitness and exercise, particularly athletics. Discussion and clinical charts present its importance as a factor in diagnosis and treatment in both acute infectious diseases or other acute conditions and in chronic ailments, and particular attention is given to cardiac diseases and the subject of arteriosclerosis and the importance of determining the condition of bloodvessels and of making comparison of different forms of blood pressure tests. A chapter is devoted to the discussion of unsuccessful management of conditions in which blood pressure is abnormal, due to carelessness or insufficient study of the case, neglect of reaching ultimate causes and a too great valuation set upon a drug therapy too little understood.

to blood pressure is presented in the book. The importance of blood pressure in surgery is outlined and emphasized and its importance in

practical application to insurance practice receives attention.

All its relations are touched upon and thus its interdependence upon many diverse factors of disease, metabolism, relation to environment, all the conditions which surround life and which constitute life. The fact that it is so largely dependent upon the sum of these conditions is, however, rather too sketchily touched upon. Particularly is this the case in the very brief mention made of psychical influences. True, various nervous conditions and marked disorders of the nervous system are mentioned, as well as certain distinctly psychiatric conditions, but these are not thoroughly enough defined as part and expression of a psychical life which as a whole, from a dynamic point of view, plays a continuous role in determining such an important indicating factor as blood pressure. More weight might well have been laid upon this wide and fruitful field of study as it presents itself through more manifest psychic influence and indirectly through the more obscure working of the autonomic and sympathetic nervous systems. This has been touched upon as much perhaps as could be expected in such a wide survey, but emphasis upon it would have kept it more constantly in sight throughout the study as a factor at work in every other manifested condition, and never to be neglected etiologically and therapeutically.

The Control of the Drink Trade. A Contribution to National Efficiency, 1915-1917. By HENRY CARTER. With a preface by LORD D'ABERNON. New York: Longmans, Green & Co., 1918. Pp. xvi-323. (Price \$2.50.)

One of the problems that is of special importance for us here in the United States during the war is the control of intoxicating liquors. England has gone through this problem and found a satisfactory solution. The details of that solution are worth while knowing because there would be many advantages in our control of sale and consumption. England found very early in the war that the increased amount of money paid to workmen led to a much greater consumption of intoxicants with serious results as regards health and crime and also as regards efficiency. Men who drank to excess neither worked so constantly nor so well as those without it. It became indispensable then, as a war measure, that the drink traffic should be regulated. Without puritanic intolerance and absolute prohibition they have succeeded in accomplishing that to the decided advantage of the health of the nation as well as regular work and the provision of an abundance of munitions.

Their regulations consist of limitation of the number of hours of the "drinking day," for it was found that particularly the late hours encouraged intemperance; the lowering of the alcoholic strength of liquor sold by dilution and the forbidding of treating and of the retail sale of liquor on credit; the reduction of the excessive number of the licenses to sell liquor as well as the enforcement of penalties both against drunkenness itself and the supplying of drink to a drunken person as a serious crime against the community. With these regulations it has been possible to work some very striking reforms. Saturday afternoons were free before the war and were made the occasion for a drunken spree by a great many of the working class. The introduction of a "spiritless Saturday" in certain places near great munition works led to such a reduction in the number of arrests on Saturdays that there was an average of less than one arrest where there used to be more than twenty of an afternoon.

They have proved in England that the control of the liquor traffic within wide limits is a simple matter. All that must be done is to regulate. There is no need to obliterate it, but just bring it under control to very decided advantage.

Transactions of the American Surgical Association. Volume xxxv. Edited by JOHN F. BINNIE, M. D., Recorder of the Association. Printed for the Association by William J. Dornan, Philadelphia, 1917.

The 35th volume of the *Transactions of the American Surgical Association* contains a series of valuable surgical contributions. The majority of the papers relate to stomach or intestinal surgery, and represent the latest work in this field. There are also a number of papers relating to war surgery. The entire collection of papers is perhaps somewhat more comprehensive than the previous volumes.

Manual of Vital Function Testing Methods and Their Interpretation. Second Revised and Enlarged Edition. By WILFRED M. BARTON, M. D., Associate Professor of Medicine, Medical Department, Georgetown University; Attending Physician to Georgetown University Hospital, Columbia Hospital and Washington Asylum Hospital, Boston; Richard G. Badger; Toronto: The Copp-Clark Company, Limited, 1918. Pp. 318. (Price \$2.)

Although the first attempts to test vital functions in man were made nearly a century ago, it is only during the last two decades that our knowledge of physiology and biochemistry has increased to the point of permitting the elaboration of a number of more or less successful methods for determining the functional states of several of the vital organs. During these twenty years much literature has grown up on this subject and, while most well read physicians have been able to keep pace with one or two methods of testing the function of one organ, few have had the time to keep abreast of the advances and best opinions in the whole field. Barton has performed a most welcome and valuable service to the profession, especially to practitioners, in bringing together the several methods, outlining the basis of each, giving the accepted technic, and discussing the probable value and limitations of the more important methods in use. Since many of the tests require the help of an experienced laboratory worker, probably the most valuable parts of this volume are the discussions on the merits of the tests and the necessary precautions to be observed in preparing the patient for their application. These tests include those for the functions of the liver, kidneys, heart, pancreas, the ductless glands and vegetative nervous system. Perhaps nothing shows better the value of this book than the fact that a second edition was called for within a year of the appearance of the first. One can overlook a considerable number of typographical errors in a first edition, but when they remain fairly numerous in a second they deserve mention, if only to call attention to their marring effect upon a good piece of work and express a hope that they may be removed in subsequent editions.

Births, Marriages, and Deaths.

Died.

ARNETT.—In France, on Tuesday, April 16th, Lieutenant John Deming Arnett, Medical Reserve Corps, United States Army, of Albany, N. Y., aged twenty-nine years.

BAILEY.—In Lyons, Ill., on Monday, April 29th, Dr. Charlotte Kent Bailey, aged forty years.

BECHTOL.—In Marion, Ind., on Sunday, April 21st, Dr. Charles Orville Bechtol, aged forty-three years.

BLACK.—In McKeesport, Pa., on Saturday, April 27th, Dr. Robert J. Black.

BLISS.—In Valley Springs, S. D., on Monday, April 29th, Dr. George W. Bliss, aged fifty years.

DRYER.—In LaGrange, Ind., on Thursday, April 25th, Dr. Dwight Welcome Dryer, aged sixty-one years.

FISHER.—In Elkhart, Ind., on Tuesday, April 23d, Dr. Albert Le Roy Fisher, aged seventy-two years.

GODDARD.—In Brockton, Mass., on Sunday, May 12th, Dr. Henry E. Goddard, aged sixty-five years.

KILGOUR.—In Cincinnati, Ohio, on Wednesday, April 24th, Dr. Peter Thompson Kilgour, aged fifty-seven years.

KOBISK.—In Lombard, Ill., on Thursday, April 25th, Dr. Frederick B. Kobisk, aged thirty-nine years.

LAWS.—In Tacoma, Wash., on Sunday, April 21st, Captain Clément Edwin Laws, Medical Reserve Corps, United States Army, aged thirty-six years.

JACOBSON.—In Baltimore, Md., on Thursday, May 16th, Dr. B. E. Jacobson, aged twenty-four years.

MCCULLOUGH.—In Mansfield, Ohio, on Saturday, April 20th, Dr. Adam H. McCullough, aged sixty-seven years.

MOORE.—In Vincennes, Ind., on Tuesday, April 23d, Dr. Reuben Gardner Moore, aged eighty-one years.

PETTIT.—In New Canton, Va., on Saturday, April 27th, Dr. William Beverley Pettit, aged sixty-four years.

RICHARDSON.—In Pasadena, Cal., on Saturday, May 4th, Dr. Aubrey J. Richardson, aged fifty-nine years.

TOWSLEE.—In Cleveland, Ohio, on Monday, April 22d, Dr. Lillian Gertrude Towslee, aged fifty-seven years.

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Original Communications

A SPECIFIC FOR EVERY PATHOGENIC MICROORGANISM.*

By EDWARD H. OCHSNER, M. D., B. S., F. A. C. S.,

Chicago,

Attending Surgeon, Augustana Hospital.

The idea of a specific in medicine is not new, for both homeopathic and eclectic medicine were built up, at least in part, on this theory. The application of the theory in those instances was, however, premature, as the etiology of disease was not then sufficiently understood. These systems attempted to find a specific for each symptom—an attempt which from the very nature of things was usually doomed to result in failure. For instance, to treat all chills by the same remedy, irrespective of their causes, is not feasible, because a remedy which is particularly beneficial in a malarial chill may be and, as a matter of fact is, very harmful in septic chills.

Today, with more accurate knowledge of infections, the theory is not only sound, but its application in these conditions is feasible. We must, however, not expect the impossible, nor every patient to be cured. Some cases will succumb in any event. Diphtheria antitoxin comes about as near being a specific as we could wish for, and yet some cases will die from diphtheria no matter how early and carefully it is administered. With quinine and other so called specifics the same is true. Some cases of malaria will go to their doom in spite of every precaution. An occasional case of lues, particularly Asiatic lues transplanted on a Caucasian, will result fatally in spite of the most expert use of potassium iodide, mercury, and arsenic.

Every wild beast has its deadly enemy; every plant its parasite, and every parasite its parasiticide; and almost every known chemical poison has its chemical antagonist, and probably also its physiological antidote.

Those of us who have an intimate acquaintance with the rattlesnake have a wholesome regard for it—some persons going so far as to believe that it is practically invulnerable; and yet, in addition to man, "the rattler has three natural enemies that are much dreaded by it and which assist in keeping it in bounds—the Mexican eagle (Caracara), the hog (wild and domestic), and the speckled king-

snake (*Ophibolus getelus*).” An old sow will attack, kill, and devour a six foot rattler and make less fuss about it than does a robin when it tackles a large angleworm. The kingsnake of Texas will attack and kill a rattler nearly twice its length and more than three times its weight, as vouched for by J. D. Mitchell, (1) of Victoria, Texas, in the following description:

“The kingsnake (*Ophibolus getelus*) seems to be able to rob the rattler of its power of resistance, as will be noted in the following account of a battle between them. It was in the spring of 1858, in Calhoun County, I heard the rattler's challenge or warning rattle, and, going to the place, I found in a clear space surrounded by brush and cacti two very large rattlers, nearly six feet long each, coiled, with heads up and rattles sounding; they were looking in the opposite direction from me, and seemed more alarmed than angry. Presently a small kingsnake, not more than half the length of the rattlers, glided out of the brush into the clear space. He came with head and part of his body raised and curved, and waving from side to side. He approached the nearest rattler, alternately swelling and flattening his neck, crawled half way round the rattler and then back again, as if looking for an opening; the rattler remained on the defensive, and both he and his mate seemed paralyzed with fear. Finally the kingsnake made a dart; for a while I could see nothing but a tangle of snakes and a cloud of dust. As the combatants quieted down, I saw that the kingsnake had the rattler by the jaw with his mouth, and had his body twisted several times around the rattler's neck; the rattler was striking the ground violently with his tail and the posterior part of his body, and the kingsnake was momentarily tightening his grip by convulsive muscular action. After a time the rattler ceased all motion, and the kingsnake gradually loosened his folds, keeping his mouth hold on the jaw. Feeling no motion in the rattler, he let go and pushed the rattler's head with his nose, then he crawled over the rattler's body several times, going from head to tail and back again, nosing the head again. Convinced that his enemy was dead, he immediately assumed the offensive attitude and started for the second rattler, which had continued in the same position during the battle with the first. A second battle now followed, the counterpart of the first. When the kingsnake was satisfied that his second victim was dead, he glided into the bushes and left the

*Address in surgery delivered at the Southern Surgical Meeting of the Tri-State District Medical Society, at Dallas, Texas, September 5, 1917. Read in abstract at the Thirtieth Annual Meeting of the Southern Surgical Society, at St. Augustine, Fla., December 29, 1917.

dead snakes to me. The kingsnake was scarcely half the length of either rattler, and showed neither fear nor hesitation at any time during the battle. The rattlesnakes showed great alarm from the start, and the second one seemed too much paralyzed by fear to crawl away during the first battle. Neither rattlesnake made a single stroke that I saw. Both rattlers had their heads dislocated from their bodies and several inches of the vertebræ crushed to a pulp."

Every practical nurseryman knows that, in order to successfully combat the parasites that attack his trees and shrubs, he must use the particular spray that has been proven effective for each parasite. For one he will use Bordeaux mixture, for another the Bordeaux and arsenate of lead mixture, for still another the kerosene oil emulsion, and, for still another, hellebore dissolved in water. He would not think for a minute of using the same solution for all parasites, for if he did he would not long succeed as a nurseryman. The above illustrations are cited to bring out and emphasize the general laws of nature to which human ailments, particularly infections, are no exception.

The medical man who treats many cases of poisoning would be severely criticised, and justly so, if he should treat all cases exactly alike. While he may use the stomach pump in a considerable per cent. of cases, he must use a suitable and different chemical antagonist and a suitable and usually different physiological antidote for each kind of poison in order to be successful.

Up to the present, it has been impossible, so far as I know, to isolate definitely and positively identify the chemical poisons generated by the different septic and saprophytic organisms which cause infections in man, yet no one will doubt for a moment but that they do differ greatly in their chemical nature, and also in their toxic action. Any one who has carefully observed a number of cases of streptococcus puerpural sepsis, with the great nervous irritability engendered by its toxins, and who has also treated a considerable number of severe cases of nasal diphtheria, with the concomitant somnolence and stupor, needs no argument to be convinced that the toxins generated by these two infections must be different. Is it not strange, then, that there are still some physicians who try to treat all infections alike irrespective of the species of bacteria causing the infection? Thus, Dakin (2), in a recent article, makes the following statement: "The perfect germicide should meet two simple requirements: it must kill all pathogenic parasitic life, while causing no harm to any cell of the living body." When we consider the different cultural requirements the different pathogenic bacteria have, some preferring alkaline media, others acid media, some growing only when air is excluded, while others must have oxygen, is it not strange that any one should think it possible to find a universal germicide? To illustrate the unreasonableness of this: Is there any one today who would expect to cure syphilis, tuberculosis, and malaria with the same remedy? To me it is quite as unreasonable to claim that gas bacillus, pyocyanus bacillus, streptococcus, staphylococcus, influenza bacillus, anthrax and glanders, and all the other infections can be cured by one

lotion. It is quite as unlikely that a universal germicide will ever be found as that a universal food will ever be discovered for all plants and animals.

Is it not about time that surgeons learn that they, too, must combat the different infections which attack the human body by using different substances, and even by the employment of different methods? In some respects, I can see no fundamental difference between the nostrum vender, who advertises his cureall for all inflammations, and the physician, who himself prescribes and advises others to use the same remedy for all septic and saprophytic infections. The medical press has very justly criticised the former, and has reduced his baneful influence to the minimum, but, so far as I know, not a single medical editorial has been written condemning the latter. A certain amount of routine in surgery is unavoidable, and may even be of real value, but too much routine is deadly; it kills the enthusiasm of the surgeon, making him a mere human machine, and unnecessarily kills some of his patients.

In this connection it must not be forgotten that one drug or remedy may be specific for a number of species of bacteria and also that each species of bacteria may have a number of specifics; thus, boric acid may be looked upon as a specific in streptococcus infections, diplococcus, of Weichselbaum infections and pemphigus vegetans, while mercury, potassium iodide and arsenic are considered specifics for the spirochaeta pallida.

As in chemical poisons taken by mouth, we usually employ the stomach tube advantageously, so in septic and saprophytic infections there are certain therapeutic remedies and hygienic measures that are quite universally applicable. Thus, a person suffering from either a saprophytic or septic infection should be placed in bed with the affected extremity elevated and a suitable retention apparatus applied so that the muscles of the extremity may be at equilibrium and at perfect rest; proper drainage should be secured by the application of a suitable dressing, or, if macroscopic pus has developed, by carefully planned and skillfully executed incision, being particularly careful not to cut through the leucocyte barrier. If incision becomes necessary, one should also be very careful to avoid mixed infection because, while the body has acquired a certain degree of immunity against the active infective agent, it has developed no immunity for other infective agents; proper elimination by the skin through suitable baths; elimination by the lungs; elimination by the bowels, preferably by saline cathartics and suitable food, and elimination by the kidneys by diuretics, the best of which is water, should all be carefully looked after.

The balance of this paper will deal mainly with the methods of treatment and definite remedies that have been found by other surgeons as well as by myself as most effective in the various types of infection. Of the many remedies recommended in the literature by other surgeons, I have included only those which I have either tried out myself and found effective, or which seem reasonable from the standpoint of my own clinical experience. Roughly, I will consider the more common infections under two headings. First, those in which, so far as I

have been able to ascertain, no real specifics have been discovered, though even among these I will cite some forms of treatment that have been highly recommended by reliable observers; and second, in which it would seem that our clinical experience justifies us in the conclusion that certain substances may be looked upon as true specifics in certain definite infections.

Anthrax and glanders.—With anthrax and glanders, I have had no personal experience and, so far as I know, no specific has been discovered for either.

Influenza bacillus.—Though I have treated two cases of pure influenza bacillus peritonitis, the remedies which I tried were futile and both patients succumbed to their infection. I have also treated quite a number of cases of apparently pure influenza sore throat, and, here too, the local applications that I tried were of no particular value. In my recent reading I have been unable to find any remedies which seem to inhibit this infection.

Gas bacillus.—I have only seen a few cases of gas bacillus infection and these were seen either at post mortem room or through the courtesy of some other surgeon. None of them have been under my personal care so that I cannot speak from experience. Davis (3) suggests long deep parallel incisions which are joined together subcutaneously; the field is then rendered aerobic by the injection of oxygen. Taylor (4) found malic and tartaric acids and quinine hydrochloride very potent in inhibiting the growth of gas bacillus in culture media. Later he (5) tried quinine hydrochloride in one tenth of one per cent. solution in normal saline for the purpose of irrigating well incised gas infections, with good results.

Blastomycosis.—In blastomycosis, my personal experience is rather limited, but, so far as it goes, potassium iodide internally and very thorough excision, being careful not to reinfest the wound, seem to be the most effective remedies.

Acute articular rheumatism.—While the specific microbic cause of acute articular rheumatism has not been definitely determined, I believe that sixty grains of sodium salicylate dissolved in eight ounces of normal saline and given by rectum once or twice a day, as first suggested to me by Dr. Emil A. Ochsner, of Rockford, Ill., comes very near to being a specific. It is certainly true that sodium salicylate given in this way is much more effective, even in much smaller doses, than when given by mouth. In addition, the joints should be carefully immobilized with the muscles at equilibrium and acids and meats should be excluded from the diet. I have included acute articular rheumatism in this list because I believe proper immobilization is one of the most important elements in its successful treatment—a therapeutic remedy rarely properly employed by internists.

Colon bacillus.—In some conditions, colon bacillus is a very intractable infection, but, in my experience, most cases have responded to the administration of autogenous vaccines. I have found from five to twenty-five million dead bacilli given once or twice a week to be more effective than larger doses. If the colon bacillus is lodged in a superficial wound, such a wound as occurs after a pus appendix operation, I have found daily tub baths at 93° F. for one half hour very effective in hastening the healing.

Gonorrhea.—Probably in no other infection has there been greater effort made to find a specific than in gonorrhea, but, so far as I know, none of the remedies so highly recommended have stood the test of clinical experience. Silver salts are still in favor with many. Personally I have had good results with vaccines, but I believe I have had better with the smaller doses beginning with 5,000,000 of the dead gonococcus and gradually increasing to 25,000,000, giving these injections with intervals of from five to seven days.

Chancroid.—In chancroidal infection, William A. Pusey considers iodoform a specific.

Specific inguinal adenitis.—Many methods of treatment have been recommended for this condition and, while these are fairly satisfactory, I have seen many cases of specific inguinal adenitis treated by these various methods that had sinuses remaining weeks, months and even years after the original incision or other forms of treatment had been instituted. When cases have come to me before they have been incised or before they have ruptured, I have had surprisingly good results by making a large elliptical excision of the whole infected area, being careful not to cut into the infected foci, then pack the wound for a few minutes with a strip of gauze soaked in Churchill's tincture of iodine, a dry dressing applied for four days, a daily tub bath at 93° F. for one half hour, with dry dressings during the interval. When the granulations are firm, usually at the end of about a week, I put on a dry skin graft (6) and in that way have always secured complete healing in a relatively short time. This method has been uniformly satisfactory in my experience and materially shortens the period of healing in most cases.

Syphilis.—I wish to insert syphilis here principally as an illustration of the value of specific treatment, without making an attempt to go into details, which can be found in the monographs on this subject, many of which recommend 33⅓ per cent. calomel ointment as a prophylactic, neosalvarsan every three to ten days until six doses are given, just as soon as a diagnosis can be made by finding the spirochaeta pallida in the initial lesion; mercury, potassium iodide and neosalvarsan in the secondary, tertiary and quartan stages.

Malignant Edema.—For malignant edema, Lord Lister (7) advised "scraping away very thoroughly under chloroform the brown pultaceous slough and freely applying acid per nitrate of mercury to the exposed surface, then applying a poultice until the eschar has separated." Fenger recommended infiltrating the healthy tissue all around the infected area with glacial acetic acid, in this way securing mummification of the diseased area, this to be followed by excision or high amputation. Lawrence Ryan recommends high amputation, with eversion of flaps, treating the wound with hydrogen peroxide and injecting the tissue with pure oxygen.

For balanitis gangrenosa, probably a form of malignant edema, Pusey (8) recommends slitting the prepuce wide open, exposing the parts to the air and keeping it bathed with two per cent. peroxide of hydrogen.

Wound.—In two cases of wounds which I treated in conjunction with Lawrence Ryan at the Cook

County Hospital, we found bromine fumes very effective.

Impetigo contagiosa.—Personally I have found a five per cent. yellow oxide of mercury ointment, or a three per cent. ammoniated chloride of mercury ointment very effective in this condition. Morrow (9) recommends squeezing the pus out of the individual pustule, removing the scales and dead skin with epilating forceps, swabbing the eroded bases with twenty per cent. silver nitrate solution and then dusting the surface with a powder consisting of ammoniated chloride of mercury six to ten per cent., boric acid fifteen to twenty per cent., and talcum enough to make one hundred per cent. Doctor Lawrence H. Prince, school physician, of Madison, Wis., in a personal communication told me that he had found the daily application of spirits of camphor to each pustule very effective. If the children are willing to submit to the application daily, he found it unnecessary to exclude them from school. I have included impetigo contagiosa here because I have seen a number of cases of this condition treated by surgeons with wet dressings, evidently on the supposition that it was an ordinary infection, with the result that the process kept on spreading for many days, in one instance until the patient finally went to another surgeon who applied yellow oxide of mercury and speedily secured healing.

Rodent ulcer.—So far as I have been able to determine, pathologists generally look upon rodent ulcer as a type of carcinoma. With this view I cannot agree; first, because there is too much round cell infiltration; second, because to me the cells looked upon by pathologists as carcinomic do not look exactly like cancer cells; third, because we do not get the same kind of regional lymph involvement; fourth, because metastasis in rodent ulcer is practically unknown, and, finally, because it does not show the same tendency to recur when properly excised. Wide excision, being careful not to infect the operative wound, with subsequent plastic or skin graft, has resulted in complete and permanent cure in every case of rodent ulcer that has come under my care.

Actinomycosis.—In actinomycosis, removing the foci of the infection, such as diseased tonsils, teeth, beards of barley or chaff of grain, then laying open the sinuses to the very tips and giving the patient sixty grains of potassium iodide for three days followed by an interval of four days and then repeating, as first suggested by veterinarians in the treatment of "lumpy jaw" in cattle, has resulted in cure of every case which I have had under treatment. It is quite essential that all the above things be done carefully and conscientiously. I have seen a number of cases in which one or the other of the above directions were neglected. The disease persisted for months and was only relieved when they were all systematically employed. Giving the potassium iodide in large doses and then an interval of suspension of the drug seems quite an important item in securing prompt and permanent relief.

Surgical tuberculosis.—There are a number of very important points in the treatment of surgical tuberculosis. Probably the most important is the prevention of secondary infection. The others are

principally fresh air, proper food, rest, and vaccine therapy (10). I have found minute doses of vaccine, from 0.000075 mg. to 0.0002 mg., of the dry new tuberculin residue given hypodermically once or twice a week much more effective than larger doses. For joint tuberculosis (11) complete and absolute rest for a considerable period of time with the other items well looked after will result in a healing of the process in almost every case, with motion of the joint reestablished in a very considerable per cent.

For tubercular ulcers without sinus formation, I have recently been applying a saturated solution of picric acid, I apply it with a cotton swab every second or third day, being careful to get as little of the solution on the epidermis as possible. Then I cover this with a dry dressing held down snugly to avoid mixed infection. This treatment seems to favor the healing greatly.

Rabies.—For dog, cat, wolf, or skunk bites, the bitten area should be rendered surgically clean, then, under anaesthesia, the wound should be laid wide open and packed with a piece of gauze saturated in Churchill's tincture of iodine, leaving it in for ten to fifteen minutes even at the risk of slight vesication. After this a fifty per cent. alcohol dressing should be applied. The biting animal should be kept in restraint and carefully observed and if rabies develops, Pasteur treatment should be immediately instituted. If it has been lost track of and there is the slightest suspicion that it was rabid, Pasteur treatment should be immediately resorted to, because when rabies has once developed treatment is, so far as we now know, futile.

Tetanus.—If there is any likelihood that a puncture wound, gunshot wound, compound fracture, or any other accidental wound is contaminated with tetanus bacilli, the patient should be anesthetized or the surface rendered anesthetic by the application of three per cent. carbolic acid in water for three to five minutes. The area should be rendered surgically clean, an Esmarch applied wherever possible, the wound laid wide open, all foreign bodies, such as clothing, paper wads, loose fragments of bone, bullets, etc., carefully removed, then the wound should be carefully swabbed with ninety-five per cent. carbolic acid, which should be left in place for a few moments, then washed out with ninety-five per cent. alcohol, the Esmarch removed, all bleeding points carefully ligated, the wound dressed wide open with gauze saturated in fifty per cent. alcohol, then an immunizing dose of antitetanus serum should be immediately given. By following the above routine in every case, I have not had a single case of tetanus develop in sixteen years, though one of my cases developed trismus on the eighth day and one trismus and opisthotonos on the twelfth day (12). In the former case symptoms only lasted about eight hours and the latter only forty-eight hours. In neglected cases where tetanus has developed, Burrows (13) recommends injecting 3,000 units antitetanus serum into the muscles of the infected region, 3,000 units into the spinal canal, and 3,000 units intravenously.

Erysipelas.—Erysipelas I consider a self limited disease which will get well in the great majority of

cases provided general hygiene and elimination are looked after properly, and the treatment is not too heroic and drastic. In forty-seven consecutive cases treated at the Cook County Hospital, during March and April of 1895, by the use of various external applications, I lost only one case. This case was a compound fracture of the skull, the man infected by the operating surgeon who, himself, was coming down with erysipelas without his knowledge. This patient died from meningitis. In private practice I have never lost a case, though one case was complicated with pneumonia, one with delirium tremens and a number occurred in very old patients. Of all the various applications tried, I have found that a wet dressing, consisting of saturated solution of boric acid in water with from fifteen to thirty-three and one third per cent. of ninety-five per cent. alcohol, the most comfortable to the patient and I am inclined to think a little the most effective in aiding the production of immunity and hastening convalescence.

Streptococcus, staphylococcus albus, staphylococcus citreus (14), and *diplococcus of Weichselbaum* (15).—In all strains of streptococcus, staphylococcus albus, staphylococcus citreus and diplococcus of Weichselbaum, I have found boric acid in water with alcohol in the proportions above mentioned more satisfactory than any of the other remedies tried. In fact, I look upon this wet dressing, if properly applied, as a true specific for the above infections. If the infection is superficial, first painting the reddened area with ninety-five per cent. carbolic acid until it turns white and then washing this off with ninety-five per cent. alcohol will almost instantly relieve the pain, destroy myriads of bacteria and considerably hasten recovery. Powell (16) describes a very interesting case of extensive destruction of vulva by practically pure pneumococci infection, which was successfully treated by painting the area with ninety-five per cent. carbolic acid, then alcohol, dusting the surface with equal parts of boric acid and iodoform. From my experiences with the diplococcus of Weichselbaum, I am inclined to believe that the satisfactory outcome was due largely to the use of boric acid.

Pemphigus vegetans.—For pemphigus vegetans, I consider a saturated solution of boric acid in water as a wet dressing a specific and, while my conclusion is based on only two cases, the cases were so clear and convincing that I think I am justified in my conclusion. During March and April, 1895, I was in charge of the contagious ward at the Cook County Hospital; my attending man was the late D. D. Bishop, a former assistant of Hyde and Montgomery. During this period a very sick man came under our care. Doctor Bishop, after a careful examination, made the diagnosis of pemphigus vegetans and expressed it as his opinion that the man could not recover. As it was the period of my early investigations in the use of boric acid, I suggested that he permit me to try a saturated solution of boric acid on the case. To this he readily consented. I gave the patient a tub bath of boric acid daily, using a couple of gallons of the solution in a bath tub and also made him sponge the involved surfaces with the solution, then I swathed every portion of the body that I could in dressings moistened with

saturated aqueous solution of boric acid and to our great surprise the patient made a rapid and complete recovery. The patient was a charity case, was lost track of, and whether he succumbed to a subsequent attack, I have no way of knowing. Bishop, in his characteristic, modest way, later doubted his own diagnosis because he said all authorities agreed that patients suffering from the type and severity of the disease presented by this patient, invariably succumbed. In the summer of 1898, a patient with pemphigus vegetans presented himself at the Augustana Hospital. I felt very positive of my diagnosis, but, to have it corroborated, I took the patient to the late Professor Hyde, who agreed with my diagnosis and told me that the patient would shortly die from the disease. I put him on the same treatment as the one above. The patient made a rapid and complete recovery and Professor Hyde was no little surprised when I took the patient to him several weeks later. He asked if he might show him at the Alumni Clinic at the Rush Medical College, where he stated that he had never seen a man suffering from that affection to the degree in which this man suffered recover even temporarily, but expressed it as his further opinion that the man would have subsequent attacks from which he would undoubtedly succumb. I told the man his great danger, but urged him to submit to the same treatment if ever he had a recurrence. About ten years later the patient came to my office, told me that he had had half a dozen recurrences, each one less severe than the previous one and each one treated in the same way, and that for the past four or five years he had been entirely free and that since then he had been in perfect health. Careful physical examination corroborated the latter statement.

Staphylococcus aureus.—In staphylococcus aureus, I find that boric acid is not nearly so effective as in the previous mentioned infections. I find that staphylococcus aureus is usually the infective agent in carbuncles and furuncles and I further find that aqueous wet dressings, as well as tincture of iodine, are very apt to favor the development of new crops of carbuncles and furuncles. For furunculosis, I have found painting each furuncle with ninety-five per cent. carbolic acid, then applying a wet dressing of fifty per cent. alcohol of a five per cent. yellow oxide of mercury salve most effective. Before this is done, however, it is well to take a culture and make an autogenous vaccine, so that, if the case should prove to be stubborn, one can inject from five to twenty-five million dead staphylococci once or twice a week. Here again, I have found small doses of vaccine much more effective than large ones.

The above method of treating furuncles is particularly to be recommended and urged in furuncles of the nose. Here the central hair should first be epilated then the furuncle treated with ninety-five per cent. carbolic acid on a probe armed with a small cotton pledget, this neutralized with ninety-five per cent. alcohol and then five per cent. yellow oxide of mercury applied. Because of the direct communication of the mucous membranes of the nose and the superior longitudinal sinus, excising furuncles of the nose is extremely dangerous. I have known a number of patients to succumb, who were treated by

excision, who would probably have got well with little difficulty if the treatment above recommended had been employed instead.

In carbuncles, I have found injecting ninety-five per cent. carbolic acid into the base of the carbuncle by far the most effective method of all tried. If the carbuncle is less than two inches in diameter, introduce the needle at the margin of the inflamed area, inserting it until the point is located directly under the base of the carbuncle, then inject ninety-five per cent. carbolic acid until it oozes through the apex of the carbuncle. I then apply a wet dressing of fifty per cent. alcohol and, later, five per cent. yellow oxide of mercury ointment. The injection of carbolic acid usually relieves the pain very rapidly, results in early exfoliation of the core and leaves a granulating surface which usually heals very rapidly. Only recently a man came to me with a very painful carbuncle of the neck, fully an inch and a half in diameter, who experienced almost complete relief from pain within a few minutes after the carbuncle was injected, whose wound was practically healed and needed no further dressings after the eighth day. If the carbuncle is over two inches in diameter, I make a number of punctures, making sure that every part of the necrotic tissue is thoroughly treated with ninety-five per cent. carbolic acid. Wherever possible, I take a culture and make an autogenous vaccine, which may come in handy if the case should not be so rapid in recovery. I believe I have been able to make the observation that cases treated by the above method are much less likely to have subsequent crops of carbuncles. In a few cases when the carbuncle has been very large, I have excised it completely with a knife, sometimes with excellent results and a number of times the cases have resulted fatally, though in the latter instances they have always been complicated with diabetes and the unfavorable outcome may easily have been attributed to that condition. Vil-ray P. Blair, of St. Louis, Mo., in a personal communication told me that he has had splendid results in excising carbuncles with the electric cautery. I can see how this can be a very satisfactory method of treatment for a large carbuncle, but, for smaller carbuncles, the injection of carbolic acid does away with a general anesthetic and causes less pain, and I believe results in more rapid recovery.

Chronic sepsis.—In neglected cases of chronic sepsis, where the wound has or has not healed, but where the patient does not seem to be able to gain strength, I have found hot air baths with profuse sweating and tub baths at 93° F. on alternating days very beneficial. Hoelcher (17) has demonstrated that profuse sweating will remove considerable detritus and aid in the elimination of much toxic material. I have applied this observation in a good many of these cases of chronic sepsis, utilizing the hot air baths to eliminate the toxic material from the system and the tepid baths to stimulate the skin and soothe the nervous system and have had the satisfaction of seeing some of these apparently hopeless cases get a new start which ultimately lead to their recovery.

Pyocyanus.—For over twenty years I have been looking for some remedy to overcome pyocyanus infection and have made use of nearly

every antiseptic I could think of. When formaldehyde first came into use, I tried it in various strengths, even going to the trouble of rigging up an apparatus to generate formaldehyde fumes. Later, remembering the high repute vinegar had at one time enjoyed I used vinegar dressings. None of the remedies which I employed seemed to have any special value and sodium bicarbonate dressings actually increased the amount of pyocyanus pus. Evidently I did not use the vinegar in the right strength, because, recently, Taylor (18) reports excellent results with one per cent. acetic acid in normal saline solution. He found that bacillus pyocyanus is rarely, if ever, found in strongly acid purulent secretions, so in trying various antiseptic dressings, he discovered that acetic acid was practically a specific in treating pyocyanus infections. That the beneficial action of the acetic acid solution is not entirely dependent upon its acidity is proven by the fact that nitric and hydrochloric acids in weak solution had little inhibitory effect, and we all know that boric acid solutions do not inhibit its growth. Sodium bicarbonate seemed to stimulate the growth of the pyocyanus bacillus as did also Dakin's solution. Since reading Taylor's article, I have had only two cases of pyocyanus infection; one was relieved by applying the dressing twice and one by applying it once.

Saprophytic infections.—In indolent ulcer, particularly nonsyphilitic ulcer of the leg, I have found Unna's paint applied in the form of an Unna paint boot, as first introduced in this country by W. S. Royce, (19) very satisfactory. By this treatment I have been repeatedly able to completely heal large nonsyphilitic ulcers of the leg with the patient at work nearly every day. For some reason, syphilitic ulcers do not tolerate this dressing well, even if the patient is placed on active antisiphilitic treatment during its application. I have had a number of cases where the pain from the dressing was intolerable and the boot had to be removed. In these cases I have found a remedy suggested by Stuart McGuire (20) very beneficial. It consists of a wet dressing of two grains of chloral hydrate to each ounce of water, the dressing being kept moist constantly. This dressing, however, must be used without a rubber protective. Since using this dressing, I have repeatedly been surprised at the rapidity with which these old ulcers will epidermize. In my experience, it has proven much more valuable than scarlet red, and I believe the remedy is not only of value for indolent ulcer but for all forms of saprophytic infections. H. M. Richter, at a recent meeting of the Chicago Surgical Society, recommended continuous tub baths for saprophytic infections. Many others are now using Dakin's solution and nascent sodium hypochlorite for this class of cases. Personally, I have for the past thirteen years repeatedly prescribed daily tub baths at 93° F., leaving the patient in the bath for about half an hour. This treatment has often proved very beneficial.

Mixed infections.—Mixed infections sometimes tax the surgeon's ingenuity to the limit, principally because it is often difficult to isolate the infective agents and thus to determine upon the most suitable remedies. If the infective agents are a parasite and a saprophyte, treating the wound with the in-

icated parasiticide and then with a remedy best suited to overcome the saprophytic infection usually accomplishes the desired result. In mixed infections, where one of the infective agents is the tubercular bacillus, Beck's bismuth paste has proven of real value. In other mixed infections, where I have tried it, I have not found it of any particular value, in fact, I have always found some one or more of the remedies heretofore enumerated very much more effective.

I have presented the foregoing conclusions at this time because I believe the personal experience of the members of this society would be a valuable contribution to surgery and because there is some danger at this moment of having all this knowledge temporarily discarded by a new fad. At the beginning of the present war, the lay press informed us with flaring headlines that Doctor Carrel was going to accomplish wonders by replacing lost ears and noses and faces by new ones and was going to thereby revolutionize the art of surgery and minimize the horrors of war. However, something must have gone wrong. At any rate very suddenly this class of copy disappeared from current literature. Something had to be done to fill space and a new eighth wonder had to be discovered to appease the American public's desire for sensation. A new solution had to be invented. For the sake of euphony this solution was called "eusol" and, while I believe this is of real value in some saprophytic infections and possibly also in certain types of septic ones, particularly some neglected cases of mixed infection such as the severely mutilated war shrapnel wounds, I am thoroughly convinced that it is absolutely useless in some cases of septic infection and even positively harmful in others, as in the following case, history of which was furnished me by Doctor H., who consulted me.

On about March 14th, F. B., aged twenty-one, called at my office, complaining of a painful callosity over the insertion of right tendo Achilles, caused by a shoe. I painted with iodine, made free incision, and dressed with wet dressing of bichloride of mercury 1:5,000. Was called early next morning and family reported the patient had had a very restless night with a hard chill about midnight, lasting one half hour. The leg was swollen up to the knee and very painful. Sent patient to hospital, and under an anesthetic made a number of free incisions, dressed with Dakin's solution twice daily for about ten days, temperature remaining 102° to 104° and the patient becoming more sick each day. You were then called in consultation and advised saturated solution of boric acid three parts with one part ninety-five per cent. alcohol. Within twenty-four hours we had a changed picture, temperature was lower, the patient's general condition appeared much better. He continued to improve, and at the end of a week temperature was normal and the infection had subsided.

When I saw the patient he was desperately sick, the whole leg up to the knee was greatly swollen, tender, and very painful. The subcutaneous cellular tissue was boggy and pus was discharging from numerous wounds.

Taylor (21) also found Dakin's solution nearly inert in pyocyanus and gas bacillus in culture media and actually found it to increase the growth of pyocyanus bacillus on wound surfaces. He also found it lacking in bactericidal power on the bacillus aerogenes capsulatus and the staphylococcus aureus, both in culture of broth and a medium containing albumen. (2) Connor (22) found cresol useless

in cases of infection caused by the gas bacillus and streptococci. In this connection, it must be remembered that, while cultural investigation as to the value of a certain remedy in the treatment of certain types of infection has its value, it must not be relied upon exclusively, but must always be controlled by clinical experience and observation. Thus, while it is a well known fact that boric acid (14) does not inhibit the growth of pus microorganisms it does reduce their virulence and greatly assists the body to overcome their deleterious effect. Taylor has demonstrated that, while cresol in 0.08 per cent. solution will inhibit the growth of bacillus pyocyanus in culture media, it has little or no effect upon the development of bacillus pyocyanus when applied to an ulcerative surface infected by this organism.

In an article by Dakin (23), Lee, Sweet, Hendrix, and Le Conte, is the following quotation, "After careful surgical preparation of the wound at the primary dressing, and excision of all foci of infection and of devitalized tissues," etc. While this may be good advice in the case of some war wounds which come to the surgeon later than twelve hours after their infliction, it would certainly be bad advice in the case of ordinary septic infections of civil life. Few civil surgeons of large experience would, I am sure, be willing to follow this advice as routine practice, for the simple reason that the foci of infection may be so numerous and involve such vital anatomic structures that excision of all of the foci of infection and of all devitalized tissues would be incompatible with the life of the patient. Take for example cases of severe pelvic infection or abscess of the lung or multiple abscesses of the liver. There is another serious objection to this procedure in civil practice, and that is, if this advice were followed, the incision would have to be made beyond the line of demarcation which would necessarily open the lymph channels to infection, and would tend to cause general sepsis and unnecessarily delay healing of the wound. Take as an illustration a circumscribed infection of a finger which usually will recover in a few days by applying the right dressings and securing rest. Excising such an infection would be almost sure to cause the infection to spread along the tendon sheaths which would cause permanent contracture and would certainly greatly lengthen the period of convalescence, to say nothing of the increased risk from sepsis.

We should be very careful not to become faddists, because a faddist in medicine is always a nuisance and sometimes even a serious menace to the people whom he serves. While it is possible that eusol or Dakin's solution may be of real value in treating the horribly mangled shrapnel wound, I am thoroughly convinced that the attempt to make it indiscriminately substitute it in the treatment of septic infections that occur in civil life much serious harm may be caused. Every American workman will in the course of the next few years unnecessarily acquire contracture, possibly mutilation, and even lose their lives. These unfortunate results can be avoided if we will treat each case of septic infection with the remedy

which has been found most effective during many years of painstaking study, investigation, and clinical experience.

All this is my argument in support of my contention that we should make persistent effort to find and then to apply a specific remedy for every pathogenic infection. This done, we may be confident that future results will be much better, infinitely better, than if we continue to jump from one fad to another and treat all infections with one or two fashionable remedies.

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2155 CLEVELAND AVENUE.

THE TREATMENT OF HAY FEVER AND ASTHMA BY POLLEN EXTRACTS AND BACTERIAL VACCINES.

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With a view of selecting the most effective treatment of hay fever for the season of 1918, we have made an analysis of 285 cases treated during the past year at the Hay Fever Clinic of the Charity Hospital and in the private practice of the author and Doctor Narcisse F. Thiberge. The treatment in this series has been practically limited to hypodermic medication, the material injected being some form of pollen extract or a bacterial vaccine.

In every case, the diagnostic test was first made in order to determine the pollen or pollens to which the patient was sensitive. The selection of these were made in accordance with our classification from a biological standpoint of the principal hay fever pollens into four groups (1), viz., 1, Ambrosiaceæ (ragweeds); 2, Gramineæ (grasses); 3, Artemisia (wormwoods), and 4, Chenopodiaceæ (amaranth, chenopods, Russian thistles, and docks). Groups not including certain hay fever pollens found in special localities, as for instance those of the mountain cedar (*Sabina Sabinoida*) in Northern Texas, the Western cottonwood (*Populus Sargentii*) in Dakota, Arizona, and Nebraska, yet still including ninety-five per cent. of the known hay fever pollens (2) and therefore greatly simplify the diagnostic tests. These are limited to the pollens to which the patient is exposed as shown by the botanical distribution of the hay fever plants in the lo-

cality in which the patient lives (radius of five miles).

The *Artemisia* group, for instance, is not found in the Eastern and Southern States, and it is therefore unnecessary in this section to test the reaction of the patient to these pollens (3). The tests should therefore be limited to the ragweed, grasses, and chenopodium groups. During the active hay fever season, the presence of the prevailing hay fever pollens is demonstrated by the atmospheric-pollen plates (4).

Diagnostic tests.—The tests of the patient's reaction to the hay fever pollens are the following: 1, nasal; 2, ophthalmic; 3, cutaneous, and 4, intradermal.

In the nasal test some of the pollen is applied directly to the nasal mucosa. This may be done by means of a pledget of cotton or the patient may inhale the pollen directly from the flower (inflorescence). This method is crude and should never be used during the hay fever season, as it may lower the patient's normal resistance to the pollens (5).

In the ophthalmic test a drop of pollen extract of the strength of 100 units to the c. c. is instilled into the conjunctival sac. A "unit" in pollen therapy represents 0.001 mg. of pollen protein. The reaction is indicated by injection of the surrounding membranes. It is difficult with this test to determine the degree of the patient's susceptibility, and it is, moreover, inapplicable during the hay fever season when the patient's eyes are usually already irritated (conjunctivitis).

In the cutaneous test the skin of the forearm is first scarified and the pollen extract (one drop of the 1000 units to the c. c.) is applied. This method can be used at any season, but lacks the accuracy of the intradermal test, and is also unreliable as regards the degree of the patient's susceptibility to the pollen.

In the intradermal test five units of the pollen extract (0.05 c. c. of the 100 units to the c. c.) is injected into (not under) the skin of the forearm. In positive reactions an urticarial wheal surrounded by a circle of hyperemia develops in fifteen minutes. The degree of sensitivity of the patient to the pollen is indicated by the size of the wheal, which varies from 0.3 to 2.5 cm. in diameter. In most cases, two tests, as for instance of the grass and ragweed pollens, are made at one time, so that the reactions may be compared.

The injection should be made with the usual precautions regarding asepsis. Alcohol is used for the skin of the patient, as the stain of iodine obscures the appearance of the reaction. In many hundreds of tests there has been no case of infection and no serious reactions.

Prophylactic treatment.—In the preventive treatment of hay fever by means of pollen extract the treatment should commence four to six weeks before the usual appearance of the hay fever. The injections should be made two or three times a week, the doses gradually increasing from five to fifty units. Although doses increased to a high number of units (1,000) have been advocated, and several of the pollen extracts on the market are especially prepared for this, no apparent advantage was observed. On the contrary, some of the cases, in

which there was no perceptible improvement, were among those in which the prophylactic doses had been increased to 700 to 1,000 units for each injection.

Several days before the patient's hay fever season is due, the prophylactic doses should be rapidly decreased, as the patient will soon absorb the pollen from the atmosphere. In a case, for instance, in which the patient is receiving fifty units of the pollen protein, this should be reduced to ten units.

Treatment during the active stage of hay fever.—The treatment of the cases of this series, during the active stage of the hay fever, was limited to the hypodermic injection of pollen extracts and bacterial vaccines. The extract of the pollen was selected to which the patient was found to be sensitive and to which he was exposed as indicated by the pollenometric records. The pollen responsible for most of the early hay fever cases (April to July) was found to be from the grasses (Gramineæ), which also include the cultivated varieties such as rye, wheat, oats, and corn. The fall hay fever (August, September, October) was found to be principally due (ninety-five per cent.) to the ragweeds (Ambrosiaceæ). The large size of the corn pollen (eighty microns) limits its potential area to a short distance from the plant.

In the spring hay fever cases the extract of the grass pollen was used, and in the fall cases that of the ragweeds. In cases in which the patient suffered from both forms of hay fever (spring and fall) the grass pollen was injected at first, and the ragweed extract during the fall season. Combined extracts should not be used in these cases, either for prophylactic or curative purposes. The grass pollens predominate in the early part of the season and the ragweed in the latter, and the pollen extracts should therefore be adapted to each season. The patient, moreover, is rarely equally sensitive to both pollens, so that a combined extract, in which equal parts of each pollen is used, is not indicated.

While our former experience has shown that pollen therapy is useful in the treatment of hay fever, we found that there were many cases in which this form of treatment alone did not give satisfactory results. With the majority of patients, therefore, this was combined with the vaccine therapy. Selecting the cured (seasonal) cases we find that in forty-one per cent. pollen extract only was used, in fifty-four per cent. both pollen and vaccine therapy, and in five per cent. bacterial vaccines only. The selection of the form of treatment varies according to the patient's condition, which is influenced by the number of atmospheric pollens which he is inhaling. This depends upon the season and the velocity of the prevailing wind. During the early part of the season, when the grasses and weeds are beginning to pollinate, and toward its end when this is nearly completed, the number of pollens in the air is relatively small and the patient's attacks are light. During the middle of the season, however, the number is greatly increased with corresponding suffering of the patient.

The principal cause of the increase in the hay fever paroxysms, however, is due to atmospheric disturbances during the active pollinating season. During a light wind, one to six miles per hour,

pollen is carried only short distances, while in high winds, fifteen to twenty-five miles per hour, pollen in large quantities is carried to great distances (five miles or more), so that the number may reach 300 to 400 pollens per square yards of air (6). During the prevalence of such winds, all hay fever patients in the vicinity, who are sensitive to these pollens, suffer greatly. If the patient applies for treatment during a severe period, the pollen extracts are usually ineffective and a vaccine should be used, these being injected at intervals of one or two days until the severity of the attack subsides. The pollen extract is then used, the vaccine injections being resumed if a severe paroxysm develops. Our reason for using the vaccine during severe paroxysms is that at this time the patient is suffering not only from the effects of the pollen but also from the great increase in the pathogenic microorganisms resulting from the lowered resistance of the respiratory membranes. The use of vaccine therapy at this stage is therefore logical, and has given us satisfactory results. In a few cases (five per cent. of this series) the treatment of the successful ones was limited to vaccine therapy only. The question of autogenous and stock vaccines has been carefully considered in this series. The autogenous vaccines are preferable provided they can be obtained of the proper standard and purity. When there is any doubt regarding this, the stock vaccines of unquestioned reliability should be given the preference.

The "catarrhal" stock vaccines are the best adapted for hay fever cases, although their percentage of staphylococci and streptococci is relatively too high. For this reason, we use a vaccine based on the results of our bacterial finding in a large number of hay fever cases, and which contains per c. c. as follows:

- 350 million killed *B. Friedlander*.
- 450 million killed *m. catarrhalis*.
- 39 million killed pneumococcus.
- 35 million killed streptococcus.
- 50 million killed staphylococcus aureus.
- 40 million killed staphylococcus albus.

The initial dose of this is 0.50 c. c., which is usually followed one to three days later by a full dose of 1.00 c. c.

Asthma and asthma.—The tendency of hay fever to develop asthma is well known. It is usually a later complication, although sometimes it is the first and, occasionally, the only symptom of this disease. In the cases of their series, forty per cent. suffered from asthma during some portion of the season. Although this is a higher ratio than has been heretofore recognized in hay fever, the probability is that the proportion is still higher. There are many cases in which the nasal symptoms of hay fever are so mild and of such short duration, that the patient recognizes only the asthma from which he is suffering. In addition to this, there are also cases of asthma, due to pollen sensitization, in which the nasal symptoms are apparently entirely absent and therefore its relation to hay fever unrecognized. In view of this, all cases of asthma, especially those occurring during the seasonal hay fever season, should be tested with the extracts of the atmospheric pollens to which the patient is exposed. Our experience has shown that the number of asthmatic pa-

tients giving positive reactions to the pollens, especially of the grasses and ragweed, is quite high. This diagnostic test is therefore important, especially in view of our experience that these cases not only responded favorably to the combined hay fever therapy, but that the number of seasonal cures and improvements equals those of the uncomplicated form of hay fever.

Results of treatment.—From an analysis of the result in these patients, we find that there were seasonal cures in forty-five per cent. of the cases and marked improvement in forty-two, or satisfactory results in eighty-seven per cent. of the total number.

In six per cent. of the cases, there was little or no perceptible improvement and seven per cent. discontinued the treatment before the results could be noted. In no case was there any aggravation of the hay fever symptoms from the treatment, or other ill effect.

"Seasonal cure" in these cases indicates that there were no more hay fever symptoms for the remainder of the season. Before the opening of the following hay fever season, these cases are again given the diagnostic test. If this is positive, the treatment is repeated. In cases of recent origin, one course of treatment is usually sufficient, but, in cases of longer standing, two or three courses are required.

In some of the cases treated during previous seasons, there was no apparent improvement, but the patients had relief from the hay fever symptoms the following season.

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Occlusion Treatment of Lupus.—Chateaubourg (*Bulletin de l'Académie de Médecine*, February 26, 1918) reports the case of a young woman who, having on her forehead a broad patch of lupus, requested him to apply some dressing over it such as would render it less conspicuous. Imbricated strips of diachylon plaster were applied. Four days later, upon removal of the dressing, the lesion was found to have turned into a pink, suppurating area dotted with white specks of beginning epidermal proliferation. Since then, he has applied similar dressings in three other private patients and in eight hospital cases—the latter including three cases of lupus of the nose and cheek, three of the cheek alone, and two of the arm and hand. In every instance the lesion rapidly healed as a result of the treatment. The strips of diachylon used should be narrow, and renewed every three or four days, without any special cleansing of the lesion. Each time, when the dressing is removed, the area is found clean and covered with light yellow pus. This is simply removed with a little absorbent cotton and fresh strips applied. Constitutional treatment for tuberculous disease should not be neglected. Creosote or guaiacol in oily injections, arsenic in its various forms, and all the ordinary tonic remedies are to be administered.

INFECTION OF CHILDREN WITH THE TUBERCLE BACILLUS.*

The Pirquet Reaction. X Ray in Diagnosis. Diferent Types of Bacilli.

By E. MATHER SILL, M. D.,
New York.

This study was undertaken with a view to ascertain the prevalence of infection with the tubercle bacillus in children living in the congested districts of the lower East Side of New York.

For four continuous months a large proportion of the children coming to the clinic, irrespective of their ailment, were subjected to the cutaneous tuberculin test.

Two slight scratches about three inches apart were made on the right forearm, and, on the upper one of these, a small amount of Koch's old tuberculin, full strength, was rubbed with a wooden tooth pick, the other scratch being left as a control, and the patient was examined the next day and that following. As seen from the appended table the children ranged from a few months to ten or twelve years of age. The children of school age were about the average as seen among the poorer class in New York, the parents being mostly of foreign birth. The number of children tested was 658, and of these 61 gave a positive Von Pirquet reaction, or 9.2 per cent. of the whole number of children. These children came from healthy families, none giving a history of an open case of tuberculosis in the family. Lamson in public health studies, at the University of Minnesota, in 1913, found that only 2.5 per cent. of individuals in families in which there was no tuberculosis showed evidences of infection, while in families in which there was latent tuberculosis, twenty-two per cent. showed evidences of infection, and in families in which there was an open case of tuberculosis, sixty-seven per cent. were infected.

Doctor J. B. Manning tested sixty-two children in Seattle with a history of no known exposure to tuberculous infection and 22.8 per cent. reacted positively to the von Pirquet test. In sixty-one infants exposed to tuberculosis reported by Alan Brown at the Babies' Hospital, forty-one, or 67.21 per cent., gave a positive von Pirquet, and of these thirty-seven died of tuberculosis, or sixty per cent. of those with a family history of tuberculosis. Of 692 children living with tuberculous parents in the tenements of New York, tested by Fishberg, 67.25 per cent. gave a positive von Pirquet reaction.

Cattermole, of Colorado, tested sixty-six children in private practice ranging from one to fourteen years of age. Twenty-five of these gave a positive reaction, or thirty-eight per cent., while forty-one were negative. All these children tested showed symptoms which might be due to tuberculosis, and thirty-four of them had tuberculous parents. In spite of the fact that over fifty per cent. of the parents had suffered from active tuberculosis, only thirty-eight per cent. of the children at the time of the test showed a positive reaction. Cattermole states that probably half of the families living in

*Read before the New York Physicians' Association, January 24, 1918.

Colorado contain one or more adult consumptives, so it is not surprising that a large percentage of the children become infected.

In his series he found twenty-two tuberculous children to have tuberculous parents, twenty-seven nontuberculous children had nontuberculous parents, twelve nontuberculous children had tuberculous parents, and one tuberculous child had nontuberculous parents. This illustrates how seldom children who have parents free from tuberculosis give a positive reaction (among private patients), and, on the other hand, how frequently children give a positive tuberculin reaction when their parents are tuberculous. It is also interesting to see how children may associate with infected persons without themselves becoming infected. It would seem that possibly such children have become immunized. Similar observations have been emphasized by Manning. The younger the child the more danger there is of the infection causing clinical tuberculosis and death. Seventy per cent. of infants under two years of age giving a positive von Pirquet reaction, reported by Brown at the Babies' Hospital, were fatal, and sixty per cent. of those giving a family history of tuberculosis died. Tuberculous infection in infants means tuberculous disease. In young children the reaction indicates a recent infection that is active or partially healed. In older children the reaction indicates by its intensity the hypersensitiveness of the child, rather than the degree of the disease. The reaction varies in time of appearance. When it comes up quickly it indicates an active focus. It may not appear for twenty-four, forty-eight, or even seventy-two hours. A slow or delayed reaction indicates a latent process. Children that do not react, at first, sometimes react to a second test.

Veeder and Johnston have made a study of 1,321 hospital children in St. Louis which it is interesting to compare with my study of children among the outpatients in New York.

The following table gives the number of children tested at the different age periods, the number of positive reactions, and the percentage of positive reactions, including cases of clinical tuberculosis:

TOTAL REACTIONS, INCLUDING CASES OF CLINICAL TUBERCULOSIS (SILL).

Age (years)	No. children	Positive reactions	Percentage
Under 1	95	1	1.0
1-2	82	1	1.2
2-4	122	7	5.7
4-6	121	12	9.9
6-8	117	12	10.25
8-10	94	15	15.96
10-12	21	10	47.62
12-13	6	3	50.00
Total	658	61	

Comparing this table with that of Veeder and Johnston made up of hospital children, we find the incidence of tuberculosis much higher (up to the tenth year) in the hospital children, at each age period, as might be expected.

The children whom I tested were about the average type of school children, with only slight ailments, while those tested by Veeder and Johnston in St. Louis were all children admitted to the hospital for some pathologic condition.

The figures from abroad, especially those of Ham-

burger and Monti, have shown the incidence of tuberculous infection in Vienna much greater than that in hospital children in St. Louis, ninety per cent. or more being infected by the fourteenth year. It is probable that many of the children tested by the above observers had been exposed to infection from a case of open tuberculosis in parents or others. It is well known that Vienna is noted for its great number of cases of tuberculosis.

TOTAL REACTIONS, INCLUDING CASES OF CLINICAL TUBERCULOSIS (VEEDER AND JOHNSTON).

Age (years)	No. children	Positive reactions	Percentage
Under 1	224	25	11
1-2	127	34	24
2-4	188	57	30
4-6	269	68	25
6-8	182	74	40
8-10	157	60	44
10-12	115	45	40
12-14	112	54	48

The figures in Table I would seem to be a fair estimate of the frequency of infection with the tubercle bacillus in children (with healthy parents) in New York City. Of the 658 children submitted to the tuberculin cutaneous test, ninety-three were malnourished. Of the sixty-one children that gave a positive tuberculin reaction, the following clinical conditions were present: Twenty-two had enlarged cervical glands, eighteen of which were diagnosed as tuberculous; nine had diseased or hypertrophied tonsils, eleven had decayed teeth, eighteen had lung symptoms such as bronchitis, etc.; seven had dullness or increased vocal fremitus in some part of the lung, nineteen were malnourished and anemic, one had enlarged superficial veins of the chest, thirty-eight cases had fever. There was one case of skin and bone tuberculosis occurring in a child between one and two years of age. Children who showed any evidence of lung involvement were X-rayed, and, in five of such children pathological lesions were revealed.

Whenever possible, specimens of sputum were obtained from children who gave a positive von Pirquet reaction, for laboratory examination, but in not a single instance were tubercle bacilli found.

From the studies made in this country it must be concluded that figures of the incidence of tuberculous infection from abroad, especially those from Vienna, do not apply to our own cities, it also shows that the incidence of tuberculous infection varies in different cities in America and is considerably higher in hospital inmates than in outpatients. In my series there was a rapid increase in positive von Pirquet reactions after the fourth year, reaching fifty per cent at the thirteenth year. Too few cases, however, were tested after the tenth year to be of value in determining the percentage of infections at that age period. The value and reliability of the von Pirquet test has been verified many times by autopsy and bacteriological examination of sputum or spinal fluid.

Of 650 infants from one month to two years of age submitted to the tuberculin cutaneous test at the Babies' Hospital 114 gave a positive von Pirquet reaction, and seventy-nine or seventy per cent. of these died. All the seventy-nine fatal cases were proved to be tuberculous either by autopsy or bac-

teriological examination of the sputum or spinal fluid. Of sixty-one negative cases that came to autopsy sixty showed no tuberculosis, the test in one case was not reported. Ninety-five of one hundred consecutive cases of tuberculosis tested by Brown gave a positive von Pirquet reaction, the other five were moribund at the time they entered the hospital. Recently Knox has reported sixty-eight cases in which tuberculous lesions were found at autopsy. In sixty-one of these the von Pirquet test had been made. It was positive in forty-five and negative in sixteen of these cases. Twelve of the negative cases were suffering from rapidly spreading miliary tuberculosis, two from tuberculous meningitis, two from pulmonary tuberculosis in an advanced stage with cavity formation. In these cases the test had been made only a few days before death.

In 172 cases that came to autopsy in which the von Pirquet test was negative, none showed tuberculous lesions.

In 177 cases of tuberculosis in children between the ages of five and sixteen years in which the type of bacillus was determined Park and Krumweide found forty-six or about twenty-six per cent. to be of the bovine variety, and seventy-six of 368 children under five years (or 20.6 per cent.) showed the bovine type. This type in children is limited chiefly to abdominal tuberculosis, tuberculous adenitis (cervical), generalized tuberculosis, tuberculosis of the bones or joints, and of the skin. The human type is chiefly limited to the lungs, pleura, bronchial lymph nodes, larynx, and meninges. Infection occurs from one individual to another, while in the bovine type infection occurs usually through the medium of milk. According to the above mentioned authors from $6\frac{1}{2}$ to ten per cent. of the total deaths from this disease in infants and very young children are due to infection with the bovine bacillus.

SUMMARY.

Tuberculous infection in children up to the fourth year of age coming from healthy families was rare in my series of cases and when infection did occur it usually meant tuberculous disease, invariably so in those under two years of age. Infection was considerably increased after the fourth year, and there was a steady increase of infection up to the thirteenth. From the tenth to the twelfth the percentage of infections was nearly three times that from the eighth to the tenth. From the twelfth to the thirteenth there was a marked increase in infections over the preceding years, being more than three times that from the eighth to the tenth year. Older children are more liable to infection from sources outside the family. They are more resistant to tuberculous disease than children under two years of age. In a large proportion of infected children the cervical glands are the chief seat of involvement; the tubercle bacillus, no doubt, frequently entering by way of the tonsils and adenoids and reaching the glands through the lymphatics. Park and Krumweide, in this country, and Mitchell, in Edinburgh, have shown that in a large percentage of the cases of tuberculous cervical adenitis the infecting agent is of the bovine type. The von Pirquet cutaneous reaction is one of our most reliable aids to diagnosis; when positive it indicates tuberculous infection,

which may be active, latent, or healed in children over two years of age. In infants under two years it usually means a recent infection and active tuberculous disease. A persistently negative reaction, except in very ill patients and those with measles, excludes tuberculous infection. The Röntgen ray is frequently of great assistance to us in making a diagnosis of tuberculosis of the lungs or tracheo-bronchial glands. The Röntgen ray not only indicates the location and extent of the lesion, but to those experienced in interpreting the Röntgen ray plates it also shows the character of the lesion more accurately than can be determined by signs or symptoms. Next to autopsy it gives us the most exact information as to the pathology of the disease. The Röntgen ray is not infallible and should be used in conjunction with other diagnostic measures to corroborate the diagnosis. From the fact that such a large percentage of infections in infants and young children are due to the bovine type of bacillus, the importance of clean milk from tuberculin tested cows is emphasized. Examination of all milk for the tubercle bacillus which is for the consumption of infants and young children should be imperative. If there is doubt as to the source or purity of the milk it should be heated to a temperature of 140° F. for twenty minutes before being used. According to no less an authority than Park, this destroys the tubercle bacillus.

Case records of five children (showing a positive von Pirquet reaction), with pathological conditions in the lungs as shown by x ray findings:

I.—Child of seven years, with clinical diagnosis of bronchitis, malnutrition, dental caries, and enlarged cervical glands. The x ray showed in the right pulmonary field the apex slightly mottled and the hilus thickened.

II.—Child of nine years, with diagnosis of hypertrophied tonsils, adenoids, and gastritis. The x ray showed thickening of the hilus of both lungs.

III.—Child, eleven years of age, with clinical diagnosis of bronchitis, malnutrition, and enlarged cervical glands. The x ray showed profuse infiltration of the hilus of both lungs. The lymphatics of the hilus of the lungs are all enlarged. There is probably some slight tubercular involvement of the lungs, which is apparently arrested.

IV.—Child, ten and one half years of age, with clinical diagnosis of malnutrition, dental caries, enlarged cervical glands, and bronchitis. X ray shows profuse infiltration in both lungs, calcified deposits in both pulmonary fields, and thickened lobes. The involvement is mostly in the middle and lower lobes of the lungs.

V.—Child, thirteen years of age, with clinical diagnosis of cough and constipation. X ray showed disseminated tubercle nodules in both lungs and enlargement of the lymphatics. More tubercles seen on the right side. Prognosis favorable.

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174 WEST SEVENTY-NINTH STREET.

Uncontrollable Hemorrhage in the Field.—J. Campbell (*Lancet*, February 23, 1918) advocates the prompt closure of the wound from which the uncontrollable bleeding is coming by means of tight suture of the skin and deep fascia, or its closure by Spencer Wells or Kocher forceps. This induces a hematoma with pressure on the open vessels due to tension in the cavity.

DIAGNOSTIC KINKS IN THE INFECTIOUS DISEASES.*

By S. DANA HUBBARD, M. D.,
New York.

In bringing to your consideration such an elementary subject as Diagnosis in Infectious Diseases it is felt that an apology is necessary, but, when comparisons are made, it appears not only desirable, but indicated. My unusual experience in public diagnosis of the infectious diseases has brought to light errors almost unbelievable, and I think if the family attendant would avail himself of some of these "kinks," some of our very frequent errors in diagnosis would become more infrequent.

In making diagnosis for the municipality, there is no more difficult situation than to try to clear the atmosphere where a rather glaring error of the medical attendant has subjected the patient to isolation and the family to unnecessary expense, to say nothing of making the community provide an unnecessary quarantine. Public officials as a rule give preference to the opinion of a physician and will not, at any time, in this city, enter into a dispute between a physician and his patient or the family of such patient. When there is a difference of opinion between two physicians, then the department does take a hand and endeavors to make a diagnosis.

SOURCES OF ERRORS.

Making a false start.—It has been said that the attainment of a correct opinion depends largely on making a right start. This applies with the greatest force here, as not infrequently the call, "Come over, Doctor, the baby has a rash, and mother fears she has the measles." The suggestion by the experienced lay party—not infrequently "grandmother"—has placed a mental idea, amounting, many times, to an obsession, and physicians find it difficult to differ from the opinions of elderly and experienced members of the family who, while many times correct, yet, on innumerable occasions have caused us to stray.

Snap diagnosis.—A snap diagnosis is made, and these hasty, hurried, and often times imperfect physical examinations quite frequently result in errors. Snap diagnosing may be the result of our teaching—or rather "lack of teaching"—neglecting to place emphasis on details or the sequence of details. It might be safely asserted that in no line of diagnosing is it so essential to have a high regard for details and accuracy as in the infectious diseases. Again, improper and irregular histories gained from information sought in a superficial, hasty manner is apt to get superficial and hasty consideration. It might be also stated that in addition to a good history the next essential is careful examination of the patient entirely undressed. This should be the invariable rule. In cases which are not quite clear—borderline or suspicious ones—there is no need for haste, as the case does not have to be reported until *diagnosed*, according to the law. Every case of infectious disease should be observed—and a second visit, often a few hours later, may reveal

facts overlooked or which might not have been present at the initial visit. This second examination indicates care and cautious action and the time taken may also be of great value to the physician as indicating the permanence or association of the symptoms. Carelessness here is inexcusable, because no person should be segregated on unsupported opinion, and the necessity for supervision should make the diagnostician doubly careful to have his conclusions confirmed.

Differential diagnosis.—In no cases are the details of differential diagnosis so important as in determining infectious diseases. The resemblance one to another and with noninfectious erythemas makes the situation critical. Copaiba, cubebs, santal oil, and similar indulgences make the determination of a drug rash and a syphilitic roseola at times most puzzling. How many physicians in practice eliminate this possibility? Quinine, salicylates, and the synthetics, especially bichloride of mercury, also occasion concern, but when an operator uses bichloride rather freely as in hernial operations, and an erythema occurs, this important condition must be given due consideration. Burns are quite frequently followed by an erythema which may be a true scarlet, yet it is not infrequently incident to absorption of other infectious material. Indulgences in sea food, highly seasoned dishes, and in childhood particularly, overindulgence in fruits and sweets, at times occasion conditions highly interesting. Dermal reactions are at all times interesting and should be considered with care and patience. Observation at times will be the only possible determining factor. Remembrance here may be trite of the dermal reactions in the administration of the various *sera*—for here the erythema at times occasions much concern. Fortunately as we have larger experience, the various determining factors quite frequently clear the atmosphere, but here too, due regard must be given to possibilities.

Great care should be exercised regarding date and time of appearance of symptoms, the locality of rash, place of first appearance, method and time of spreading, at the same time developing the sequence of symptoms.

Regarding the history, it is a good plan to begin by permitting patients to recite their own story and without urging. Follow the "story," then systematically ply interrogations, in order of sequence, and corroborate the items if possible by visual observation. Great care and patience are not infrequently necessary to obtain accurate and confirming statements, for at times it is possible to find the entire family arrayed against a possible diagnosis of an infectious condition. Bear in mind, especially in ephemeral rashes, that not infrequently *missed cases* are the ones most damaging, and this condition in future returns not to one's credit.

It is very desirable that both patient and family be impressed with the necessity for an early and a correct diagnosis not only for the proper treatment of the patient but to protect others from contracting the disease.

Develop the touch. *Tactus eruditus* in surgery is most necessary for accurate and successful work. In diagnosing rashes, nothing is so helpful as

*Read before the Medical Association of the Greater City of New York, November 19, 1917.

"feel" to the finger. I fear our associates in this work not infrequently forget this.

In our opinion, next to careful visual inspection, it is thought that the peculiar quality of the rash as determined by the sensation of feeling is most important.

By the "touch" we determine:

Elevation above skin.

The cling—that sensation appreciated by passing the finger over velvet or saten or leather.

The doughy feel is at times characteristic.

The "shotty," hard, circumscribed, rolling sensation is also at times rather characteristic.

The depth within or under the skin is helpful.

The density or firmness is also of material aid.

The fine granular condition on the surface is also at times characteristic.

AID FURNISHED BY THE DEPARTMENT OF HEALTH TO
CONTROL INFECTION.

The New York City Department of Health does the following things to aid the physician, in all instances free of charge, and also furnishes remedies at as near cost of production as possible:

It operates a corps of diagnosticians for the diagnosis, removal of patients, and aiding of physicians in determining the presence of infection.

It keeps the principal borough offices open at all times, in order to be of instant service, and the chief officials are always on duty or have a reliable assistant available when they cannot be reached. These offices have telephone service and there are telephones in the homes of the officials.

It maintains a well trained corps of trained, registered nurses, for home supervision of quarantine and the instruction of parents and others.

It supervises the registration of physicians and protects the profession and the public from the unscrupulous and irregular, and prosecutes the fraudulent dispenser of medicines, sera and the like.

It maintains a laboratory for the scientific determination of infection, operates supply stations throughout the entire city for distribution and collection of specimens, and makes both written and telephone report to physicians.

It operates a research laboratory with a well trained staff to aid the medical profession in initiating and investigating new procedures or ideas.

It maintains and operates hospitals in each of the boroughs for the infectious sick who can not or will not be isolated, providing an efficient ambulance service for the transportation of these cases free of cost.

It operates a bureau for the dissemination of the latest scientific in formation.

GENERAL SUGGESTIONS.

"Stop, look, listen" may be good advice for the traveler and pedestrian but it applies with force here. "There may be no time to think," and "The light may be poor," yet for our own peace of mind and the comfort of our patient, as well as the welfare of the community, it is necessary to take time, and the busiest man will here find that he needs time too.

Whether we deserve or desire it or no, our acts under these circumstances must necessarily be su-

pervised or checked—for in public work no one should be deprived of their rights or their liberties and forced to undergo expense unless the opinion is true and confirmed.

The experienced, well informed laity—for in the home this species flourish in untold numbers and it is these the doctor finds antagonistic—may, by the exercise of tact, diplomacy, and skill, have their errors of diagnosis smoothed out and in time overlooked.

GALLSTONES.

History, Diagnosis, and Medical Treatment.

By SAMUEL WEISS, M. D.,

(Continued from page 984.)

SPECIAL DIAGNOSIS OF GALLSTONES.

What physician does not err in the field of diagnosis of the disease processes occurring in the upper portion of the abdomen? The abdominal changes below the navel permit a diagnosis a hundred times easier than those above, since it is permitted to the gynecologist to examine the vagina and rectum. Vastly more difficult for the physician becomes the differential diagnosis if jaundice associates itself with the pain arising in the right hypochondrium, as its appearance by no means proves that the stone has reached the common duct. It can be the sole expression of an inflammatory process, which has extended from the mucous membrane of the gallbladder to that of the bile ducts.

The majority of gallstone colics are in my opinion the expression of an inflammatory process in the gallbladder. The inflammation causes pain, since the secretion collecting in the hollow organ stretches its walls. The pain is indisputably the most prominent symptom of gallstone disease, and in the great majority of gallstone cases the physician is summoned to the assistance of a patient solely on account of the pain. The pain remains the centre about which the attention of the doctor and the patient revolve. For this reason I regard a thorough description of the different exhibitions or expressions of pain in cholelithiasis as indicated. The pain of gallstone colic is of very different nature. It is not necessarily always cramplike nor does it show itself always with extraordinary violence. A serous cholecystitis passing off in a few hours causes only slight discomfort which is felt as a slight pressure in the region of the gallbladder and as a moderate cramp in the stomach. An acute purulent inflammation of the gallbladder excites violent pains especially if the outer coat of the gallbladder and the neighboring peritoneum participate in the inflammation.

While in the first case, the examining hand excites only a slight sensitiveness to pressure, in the latter kind of cholecystitis it is scarcely possible to undertake an examination; the gallbladder is so excessively painful that even the softest touch of the patient occasions the greatest torture. If the stone is driven into the cystic duct, there is added to the pain of the inflammation that of obstruction and I can almost believe that the pain which the

stone excites in the spiral cystic duct is even greater than if it passes the papilla of the duodenum. If the stones are seated only in the inflamed gallbladder, the principal pain is experienced in the right hypochondrium. The pain radiates in the meantime also into the breast and the back, especially if the concretions are driven into the bile ducts. If these are in the common duct, then the epigastrium, more rarely the left hypochondrium, is also painful to pressure. Very frequently gallstone colic is regarded as an ordinary cramp of the stomach. That it is often difficult to distinguish the pains of stomach affections, especially by ulcer ventriculi, from gallstone colic, is proved to me by the fact that I have seen patients operated upon for gallstones, and ulcer of the stomach was found; while other patients were submitted to a strict ulcer cure, by the most eminent stomach specialists, while the presence of gallstones had been positively denied and later developed typical gallstone symptoms. It may be that the gallstones were latent, and the patients, when they were under the care of the stomach specialists, actually suffered from an ulcer of the stomach. At a gallstone operation it is surely not an easy matter to determine the presence of a synchronous ulcer of the stomach or duodenum. Cholelithiasis associated with ulcer of the stomach is by no means rare, which adds greatly to the difficulties of a differential diagnosis.

For the differentiation of the two diseases under consideration, the most eminent authorities cite the kind of pain. A gallstone patient has for the most part lighter pains after lobster mayonnaise and cucumber salad than after soup and milk and it is a fact that frequently for a long time, even on a heavy diet, he feels nothing of his gallstones, while he frequently has discomfort with a very unirritating diet. The pain of ulcer depends rather upon the quantity and quality of the food and begins from a half hour to four hours after eating. Furthermore, special attention should be called to the fact that the pain of ulcer rarely occurs with an empty stomach or at night, while the gallstone colic pain occurs in the night on an empty stomach about five hours after eating. In a former paper (6) I gave the differential diagnosis between cholelithiasis and ulcer of the stomach. Eating at regular intervals, as customary during the day the little bile that flows into the gallbladder, puts itself at the disposition of the intestine and proceeds directly through the choledochus into the duodenum. During the night in which one sleeps and usually eats nothing, it collects in the gallbladder. Nothing is better suited to give rise to a stasis of bile in the gallbladder than irregular and frugal eating. The stasis gives rise to the inflammatory swelling of the cystic duct, and thus is explained, perhaps the beginning of gallstone colic about midnight. I have on this account advised gallstone patients to accustom their gallbladders to a regular emptying, to eat every three hours, and if possible, to add a late supper. Although I know that a frequent occurrence of cholelithiasis in the female sex is to be ascribed to well determined causes, such as costal breathing, unnecessary clothing, excessive lacing, and pregnancy, yet one might be tempted to hold that the rarer occurrence of cholelithiasis in men

depends upon late hours and offerings to Gambrinus and Bacchus; he frequently expels the bile from the gallbladder by a late midnight supper. Although in such a horribly painful disease, such a jocular and hardly scientific observation may scarcely be cited, and I eagerly take to myself the reproach, yet I have gained the impression that a late supper was desirable for gallstone patients. I recommend it and after a few years will be able to report regarding such night cures. At all events, gallstone colics occur independently of meals and more frequently than the pains of ulcers. The opinion of Boas that the pain of cholelithiasis is exquisitely cramplike and that there is a special pressure point to the right of the spine at the level of the twelfth dorsal vertebra I can by no means confirm with my experience. The pain of gallstone colic can likewise be boring, nagging, and fixed in a well defined place, as the pain of ulcer of the stomach. Differentiation between the two kinds of pain is that the pain of gallstone colic is more to the right and localized in the region of the gallbladder, whence it frequently radiates to the back, to the right shoulder blade, and into the breast; but not infrequently it bores and nags in a very circumscribed place under the right rectus abdominus without assuming a radiating character. On the other hand, the pain of ulcer almost always leaves the right side of the abdomen free, and is localized especially in the middle line or the left hypochondrium.

We see, therefore, that from the kind of pain it is not easy to distinguish the two conditions. Better evidence in this respect is given us by the course of the disease and the result we obtain by an examination of the contents of the stomach. In cholelithiasis, one may feel well for weeks or months; one may bear the heaviest diet, drink liquors, and commit other indiscretions, to be then suddenly attacked by colic during temperate living after milk, soup, or acorn cacao. One seldom observes this in ulcer of the stomach. As to the state of the stomach's contents, it is well known that increase of the hydrochloric acid formation is frequently observed in ulcer of the stomach, while in gallstone disease, one finds either normal or deficient hydrochloric acid, unless severe stomach symptoms arise owing to adhesions and stenosis at the pylorus.

Appendicitis can easily be confounded with cholelithiasis or cholecystitis, especially if the appendix is turned upwards and reaches the lower liver border. In fact there is no great difference between the pathologicoanatomical processes which take place in acute cholecystitis and acute appendicitis. In both we have a hollow organ lined with mucous membrane, the contents of which is infected and whose excretory ducts are obstructed. The patients vomit; they complain of severe pain, and flatus ceases to pass. Now, if in appendicitis the pain is localized more upward and in cholelithiasis more downward, then it is not easy to separate the two conditions from one another. If the two diseases attack the patient at the same time, naturally one diagnoses the disease which occasions the most pronounced symptoms and that is appendicitis.

Intestinal colics in the region of the transverse colon are difficult to distinguish from gallstone colics

of slight degree. I have known cases treated for years as intestinal colics, since the pains actually ceased with the passage of flatus and stools. This is, however, also characteristic of gallstone colic, as soon as flatus passes, the pain ceases, even when no adhesions exist between the colon and gallbladder. All gallstone colics are not cramplike, nor do they radiate to the back; often the pain is only moderate and stabbing and not at all distinguishable from intestinal colic, if one cannot by examination prove that the lower liver border is sensitive to pressure. A confusion of acute cholecystitis with ileus is possible, since the former can run its course under the guise of an obstruction of the bowels. The circumscribed peritonitis of the gallbladder, pericholecystitis involves by preference the omentum and intestine into participation in the disease. The intestinal wall is in this place locally paralyzed and constipation and vomiting appear. Since the intestines became distended and thus make the examination of the abdomen difficult, one may fail to recognize the cholecystitis as the cause of the symptoms of ileus.

Peritonitis and gallstone disease have often been confused, for in both diseases collapse, excessive sensitiveness to pressure of the abdomen, rapid pulse, and elevation of temperature occur. In general with peritonitis the pulse is frequent and small, the fever is usually high; yet I have seen some cases of purulent peritonitis in which the pulse remained good and the temperature showed slight elevation or none at all. More emphasis is to be laid on the type of breathing, which in peritonitis easily becomes purely costal, while in gallstone colic, the diaphragm remains subject to a visible movement. Finally, the proof of the indoxyl in the urine, is said to speak against cholelithiasis and for peritonitis or appendicitis.

The pain of kidney colic is not always typical in that it radiates along the ureter to the bladder. It is also for the most part felt in the lumbar region. The careful examination of the urine as to quantity and color and palpation of the region of the gallbladder and the lower liver border may help to differentiate between the two conditions. If a purulent process develops on the posterior surface of the gallbladder, it may then often be impossible to distinguish this from a paranephritic suppuration. Since the results of palpation are the same, we can frequently only by the anamnesis come upon the right trail.

In acute inflammation of the gallbladder, occurring in the absence of gallstones, the pain is less excruciating than when a calculus is impacted in the ducts. I believe that cholecystitis is antecedent to every attack of biliary colic and therefore, it may be difficult to distinguish between simple cholecystitis and biliary colic. A floating kidney on the right side may produce both biliary colic and jaundice. The diagnosis depends on the detection of a floating kidney and on disappearance of the symptoms when the nephroptosis has been efficiently treated either by a belt and pad or by the operation of fixing the kidney in the loin. If attacks of jaundice and colic still continue, it is probable that there is cholelithiasis in addition, which is by no means infrequently the case. In acute dyspepsia with flat-

ulent distention of the stomach, the symptoms are less urgent than in biliary colic, and there is tenderness over the stomach rather than over the gallbladder. Hyperchlorhydria, which may occur in cases of nervous dyspepsia, may wake the patient up at three in the morning and may cause one to suspect biliary colic. Examination of the gastric juice and the relief obtained from bicarbonate of soda should enable the medical man to recognize the true nature of these cases. Mucous colic often may, if sufficiently severe, suggest biliary colic. Examination of the stools should lead to the detection of the characteristic cases, and so help to determine the condition present. Mucous colic may be associated with the passage of intestinal sand and with abdominal pain.

There are two forms of intestinal sand: 1, the false, or food residues, such as the sclerenchyma of fruits, especially, the pips of pears, the vertebræ of sardines, or salts or drugs, such as magnesia or salol taken medicinally. It is important to be aware of the fact that olive oil taken by mouth to relieve cholelithiasis may be passed as saponified masses which on a superficial or careless examination may be regarded as softened calculi. 2, True intestinal sand is composed of calcium phosphate, and is probably the result of a lithogenic catarrh of the intestine. It may also contain urobilin. The presence of true intestinal sand is often associated with mucous colitis. In acute pancreatitis, there is more profound colic and is more intense and constant than in biliary colic. Hepatic crises in tabes are very rare, but if they occur, the resemblance may be very close to biliary colic. Other obscure conditions, such as hepatalgia, or neuralgia of the liver, have been described.

Osler (7) speaks of pseudobiliary colic as not uncommon in nervous women and as being periodic and often excited by emotion, but not accompanied by jaundice. From enteralgia or neuralgia of the abdominal sympathetic, the diagnosis is not always easy. According to Allbutt (8) the pain of enteralgia often begins at the navel and is more stabbing than in biliary colic. Pseudogallstone colic may occur in malignant disease involving the ducts and in malignant disease of the head of the pancreas, but there is such deep jaundice and the condition of the patient is so grave, that little or no difficulty in eliminating ordinary biliary colic is likely to arise. In severe lead colic there is a superficial resemblance to gallstone colic. The blue line on the gums, the anemia, and the absence of any localization of tenderness near the gallbladder point to lead colic. I have seen recurrent attacks of colic with slight jaundice in a worker in lead, and the question arises whether spasmodic contraction of the bile ducts may be set up by lead and be analogous to intestinal colic. The severity of the pain may, when it is referred to the cardiac region, lead to an erroneous diagnosis of angina pectoris. Lumbago may be confused with biliary colic.

PROGNOSIS.

It is only in the rarest cases that death results during an attack of biliary colic. It may be due to the intensity of the pain giving rise to cardiac failure. Death may be due to another cause, viz., rup-

ture of the gallbladder or bile ducts during a severe spasm and perforative peritonitis due to the leakage of infected bile. In nearly all cases recovery takes place from the actual attack, but it is seldom that the first attack is the last. Usually there are

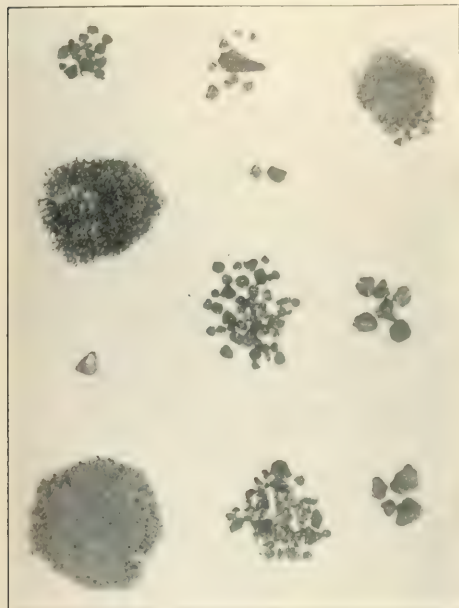


FIG. 1. Specimens of gallstones passed by patients after treatment.

a number of further attacks which are less severe than the first. A calculus sometimes is left in the common bile duct and the symptoms of intermittent hepatic fever develop or there is constantly recurring pain from the presence of adhesions around the gallbladder. The prognosis in some degree, depends on the presence or absence of facets on a calculus found in the stools. If after a first attack a smooth gallstone without any facets is found in the feces, it may be hoped that no further attacks will follow. If on the other hand the calculi is faceted, there are other calculi in the gallbladder and the probability of another attack must be faced. The patient's habit of life, his willingness or refusal to adopt means to avoid conditions which favor catarrhal cholecystitis and the production of fresh stones bear on the prognosis.

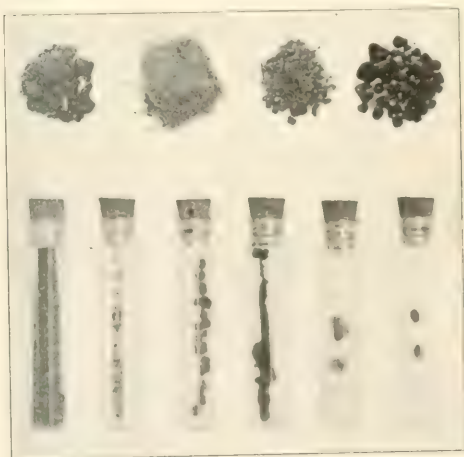
TREATMENT.

The treatment of biliary colic consists in treatment for relief of the painful paroxysms and treatment of the patient between the attacks. In acute biliary colic the pain is often so agonizing that it will yield to nothing except hypodermic injection of morphine or inhalations of chloroform. I personally have discarded morphine as a dangerous and habit forming drug, and in its stead have employed a tablet of .00065 grain of atropine sulphate dissolved under the tongue, followed by fifteen

drops of adrenalin chloride solution 1:1,000 in a tablespoonful of water. The latter may be repeated once or twice within a short time if necessary; also the local application of menthol, camphor, and methyl salicylate in petrolatum, massaged gently over the seat of pain, covered with gutta percha to favor absorption, has been invariably followed by relief within twenty to thirty minutes. According to Kraus, antipyrin, if given at the beginning of the attack, has given considerable relief. Naunyn has had favorable results with a single dose of salicylate of soda given at the beginning of the attack. Others, including myself, have found that copious draughts of warm water gave relief, even though promptly vomited.

The vomiting accompanying the biliary colic hardly requires any special treatment, apart from that of the pain. Bismuth, soda, or dilute hydrocyanic acid may be given. I employ water containing bicarbonate of soda which relieves purposeless retching by giving the stomach something to bring up. If retching persists, and the patient is in a state of collapse, iced champagne may be given. In less severe cases, the patient may be put in a hot bath of 104° F. and given tincture of belladonna, twenty minims in spirits of chloroform to relieve the spasm. Hot fomentations or poultices, unless contraindicated by cholecystitis, may be tried over the liver and antipyrin given by mouth. If cholecystitis is present, the hot bath is contraindicated and icebags are to be applied over the gallbladder region.

Treatment between attacks.—According to the surgeon, an operation will be the best way to relieve or cure the patient. How should such patients be managed with greatest advantage to themselves, when their advisers do not share the surgeon's radi-



cal views? This differs mainly with the patient affected. In fat people, especially women, and after typhoid fever, influenza, malaria, and pregnancy, it is within the medical man's power to advise a change in the patient's mode of life which will tend to prevent or diminish the liability to catarrhal

inflammation of the gallbladder and bile ducts. The points to be borne in mind are to prevent stagnation of bile in the biliary tract, or to obviate or remove any inflammatory condition of the mucous membrane of the duodenum, biliary papilla, bile ducts, etc. Gentle exercise in the fresh air if possible to favor the passage of bile into the intestines is advisable. When this is not practicable, breathing exercises to increase the movements of the diaphragm and the liver should be instituted. Stooping over desks and working in a cramped position must be corrected, while the use of tight corsets, belts, etc., should be discontinued. The patient should be warmly clad to avoid chills.

General treatment.—When we consider the nature of the disease, there is nothing to lead us to expect that operation, however improved or perfected, will ever prove an infallible remedy. The main purpose of the surgeon is to remove the stones; but can he claim that when he has removed the gallstones he has got rid of the cause of them? Even when at a considerable risk to the patient—the mortality in the hands of so accomplished a surgeon as Mayo-Robson is 16.6 per cent.—he removes the gallbladder, is there any guarantee that stones will not form in the ducts? As a matter of fact, they do and other complications ensue as a result of operation. It is true that there is a gradual lessening mortality from operation, but it would be unreasonable to expect that a time will arrive when it can be undertaken without risk, or to imagine that beyond removing the gallbladder and hepatic drainage anything more radical can be accomplished by surgery.

I maintain that the medical man can do far more in the treatment of this disease than the surgeon. First of all, be it distinctly understood that it is not the purpose of the medical man by massage or electricity to remove gallstones. It is quite true that gallstones are sometimes removed by manipulation, but the risk is too great. Stones which have been resting in the gallbladder may be forced to migrate and become impacted in the ducts. Inflammation of the gallbladder which may be slight, may become severe through such manipulations and dangerous consequences follow. Nor do I regard it as the main object of treatment to dissolve the stones. I have under my care several patients who have not passed a single stone and are free from attacks of biliary colic, due to proper diet and medication. There is no infallible remedy. When I first thought of giving to others the benefit of my experience, I asked a leading surgeon if he thought it advisable that I should do so. The reply was that I ought to do so by all means, if I knew an infallible remedy. Of infallible remedies, I know nothing. If, as this surgeon implied, operation is to be regarded as likely to prove an infallible remedy, I differ from him and regard his conclusions as neither warranted by facts nor by the pathology of the disease. When a patient has an attack of biliary colic and the disease is pronounced gallstones, he lives under a constant dread of operation, and the depression thus produced, by interfering with the functions of the liver, tends to convert what may be a very simple malady into a serious one.

The general medical treatment of gallstones, and

its various manifestations may be considered under the following heads:

The prevention of stagnation of bile; the prevention of the occurrence of catarrhal inflammation of the gallbladder and bile ducts; the removal of catarrhal inflammation when it has appeared; the attempt to dissolve and remove calculi from the gallbladder and the ducts; and spa treatment.

Stagnation favors infection, cholecystitis, and hence the production of gallstones, or if these are already present, an immediate attack of colic. It is therefore important that stagnation should be prevented as far as possible and for this object, the following methods may be adopted: 1. Exercise leads to increased movements of the diaphragm and liver and so to an increased flow of bile into the duodenum. Horse back riding, is perhaps, the best, but bicycling, climbing, rowing, and tennis are excellent. Deep respiration should be practised, so as to induce vigorous movements of the diaphragm and the liver. After pregnancy the lax condition of the abdominal wall which favors enteroptosis, hepatoptosis, and stagnation of bile may be met by massage of the abdominal muscles, care being taken not to bear directly on the gallbladder, since cholecystitis may thus be set up. 2. Attention should be paid to the dress; the corset, tight waist bands, and heavy skirts should be avoided. 3. Meals at short intervals are more effective in preventing biliary stagnation than large meals at long intervals. In addition some supper should be eaten before going to bed. When food passes into the duodenum, bile is driven out of the gallbladder into the duodenum. 4. Vichy, Carlsbad, or hot water containing sulphate or phosphate of soda may have a good effect and act as a cholagogue. In order to get the maximum effect from the water, it should be taken before meals when the stomach is empty. The water should not be taken in excessive quantities or too hot, otherwise dilatation of the stomach may occur. 5. Although a number of drugs have been credited with the power of increasing the secretion of bile, it is now generally agreed that salicylate of soda and bile itself are the only drugs. Salicylate of soda also acts as an intestinal antiseptic tending to diminish intestinal catarrh. It may be given in ten grain doses twice or three times daily with an equal quantity of bicarbonate of soda. I have found that salicylate of soda combined with sodium benzoate for periods of ten to fifteen days monthly will have a beneficial effect.

In the prevention of catarrhal inflammation it should be remembered that indigestion and gastritis, by leading to gastroduodenal catarrh, might set up catarrhal inflammation of the bile ducts which must be treated by careful dieting, drugs, and the prevention of constipation. The condition of the teeth should be seen to. Worry and anxiety are frequent causes of dyspepsia, and in this way may be instrumental in favoring infection of the ducts and gallbladder. Constipation and the attendant tendency to indigestion and gastrointestinal fermentation and putrefaction should be prevented by gentle purgatives; the use of vigorous purges must be avoided, as enteritis may thus be induced. Salines, such as half a tumbler of natural Carlsbad water

with a little hot water before breakfast or one or two drams of Carlsbad salts dissolved in hot water are useful. Phosphate of soda in dram doses may also be given in water early in the morning. The Carlsbad salts are better borne by the stomach if a little of the infusion of quassia or cinchona is added to the draught. After taking the salts, the patient should walk about, or better, practise systematic exercises with deep inspiratory movements to favor the descent of the diaphragm, and should not have any food until an hour after the draught has been taken. It is important to remove catarrhal inflammation of the biliary and intestinal tracts because calculi are formed as a result of catarrhal cholecystitis and are not likely to be dissolved so long as the gallbladder is inflamed. Harley and Barret (9) have shown that calculi introduced into dogs' gallbladders are dissolved by the bile when the gallbladders are healthy, but not when cholecystitis is kept up. The methods already referred to by which the flow of bile is increased and the bile passages washed down are of use in removing catarrhal inflammation of the gallbladder and bile ducts. The abdomen should be kept warm to avoid chills, and in cases where there is tenderness over the gallbladder, poultices, hot packs or fomentations, or heat by means of the thermophore may be applied over the right hypochondrium.

In attempts to dissolve calculi, numerous drugs have been tried but with very little, if any, success. A very famous ancient remedy was Durande's ether and turpentine mixture, fifteen drops of the former and ten of the latter in a capsule. I have found it to be ineffectual and nauseating. Olive oil has been widely used to relieve the symptoms of cholelithiasis; but there is no evidence that olive oil given by mouth, much less when injected per rectum, can act on calculi in the gallbladder. In fact, a well known fallacy about some of the good effects ascribed to olive oil is that the oil itself may be so digested and altered as to imitate softened calculi when passed by the bowel. Some of the good effects of oil may be due to its soothing and antispasmodic action on the intestine. Since the bile acids dissolve cholesterin, any increase in the secretion of bile, such as is induced by salicylates or by the administration of bile by mouth, may be regarded as a means of dissolving calculi. Since protein food increases the percentage of bile acids in the bile, meat has been regarded as an important element in the diet of patients suffering from gallstones. In attempts to remove gallstones, massage and drugs like turpentine and purgatives, which lead to muscular contraction of the gallbladder and bile ducts have been employed. At the commencement of a course at Carlsbad it not uncommonly happens that a patient experiences an attack of biliary colic and passes calculi. My own experience has been varied. I have found that each patient is a law unto himself and that the same drug will not act the same way in a similar case in another patient. I have found that a combination of sodium phosphate, sodium bicarbonate, and sodium sulphate, equal parts of each given in hot water before meals, have given satisfactory results in several cases and caused expulsion of sand and stones. In other cases, I have employed a capsule of sodium

succinate, sodium glycocholate, sodium benzoate and phenolphthalein. Still in others I have prescribed eunatol, both in pill and emulsion, with marked success. Of the proprietary articles, I have found cholelysin, in its three forms, to be useful in promoting the expulsion of biliary calculi. To prevent pain during the expulsion of calculi, I prescribe a capsule of amyl valerate, fifteen drops morning and evening, and sodium oleate, sodium salicylate, phenolphthalein, and menthol in pill form, of which three to four pills taken morning and evening followed by a glass of hot water, has often acted beneficially and caused expulsion of calculi. Oleic acid eight minims in capsule morning and evening, has given satisfactory results.

According to Mayer (10), latency in gallstones may be produced during long periods, provided stagnation of the bile and infection with micro-organisms is prevented. Unless this is accomplished, it is useless to try to dissolve stones already formed, because they will reappear; also, it is useless to operate for the removal of them unless imperatively required by grave complications. Mayer believes that the special utility of salicylic acid, but not of the salicylates, comes from its decreasing the amount of solids in the bile, rather than its augmenting the quantity. On the other hand, he ascribes much of the utility of Carlsbad water to its warmth and not to its mineral constituents, and believes that the same benefit might be derived from drinking hot water on an empty stomach. In other cases, a trial may be made of Vichy Célestine, especially, where stomach digestion is notably affected and there is no jaundice.

To those who are merely threatened with gallstones by reason of their habits and corpulence, I greatly prefer our Congress spring at Saratoga, N. Y., combined with the use of pine needle oil baths. At any spa it is essential to be in the hands of a physician as I have seen much harm done and patients injured rather than benefited by too much or too long drinking of the water at the spa and also by too rigorous dieting.

As to the kind of food most suitable for patients with gallstones, considerable divergence of opinion has been expressed. A variety of flesh food, broiled or boiled, may be enjoyed and most vegetables are permissible. All fats should be interdicted so far as possible. Alcoholic drinks must be forbidden. Sugar in any form must be limited. Frequent small meals are desirable, because in this way, the duodenal papilla is made to open reflexly and the bile allowed to pass into the intestines. I do not permit eggs, as they have caused attacks of biliary colic, probably due to their containing cholesterin.

Daily exercise, moderate and in the open air, should be insisted upon. In this way, the bile will be maintained as far as possible in a healthy condition and the amount of cholesterin diminished. We may aid this condition in many instances by the use of abundance of water and also Carlsbad water mixed with hot water in the morning on rising. During the time the Carlsbad water is slowly sipped, exercise in the house should be taken by walking up and down the room. No doubt, the alkaline salt, sulphate of sodium in Carlsbad water, as well as the hot liquid, help to liquefy the bile.

Surgery.—I have attempted briefly to discuss the medical treatment of gallstones, and though no infallible remedy suitable to all cases has yet been discovered, I am fully convinced that if an early diagnosis is made and the treatment here recommended adopted, there would very seldom be any question as to handing the patient over to the surgeon. To the indications for operation given by Mayo-Robson, I shall append a few remarks:

1. "In frequently recurring biliary colic without jaundice, with or without enlargement of the gallbladder." This is but little removed from Winwarter's famous dictum that the diagnosis of gallstones is sufficient indication for operation. Everyone knows that the vast majority of such patients ultimately recover, and it ought not to be forgotten that the mere removal of gallstones affords no guarantee against their recurrence. Why then operate? It may be said because it affords a speedier means of cure. Apart from the danger to life, which even with the most advanced and skilled surgery cannot be entirely put out of the question, the cure is not always immediate and is by no means always permanent. We have admitted, however, that in certain circumstances, a speedy cure is much to be desired, and the question whether in order to obtain it, operation is advisable, may be a practical one. Surely, however, the urgency is never so great but that other means may first be tried. 2. "In enlargement of the gallbladder without jaundice, even unaccompanied by great pain." The surgeon who has made up his mind to operate in such cases ought not to delay; otherwise he will find in the great majority that the enlargement has disappeared. It ought, however, to be distinctly stated that the mere disappearance of a distended or dropsical gallbladder does not always imply that the stone which has been blocking the cystic duct has passed into the duodenum. The effusion may disappear, and yet the stone remains at the entrance of the cystic duct, and an attack of biliary colic may soon follow. 3. "In persistent jaundice, ushered in by pain, and where recurring pains with or without aguelike paroxysms render it probable that the cause is gallstones in the common duct." This doubtless is a condition where the question of operation ought to be seriously considered, and it is one by no means easy to decide. In looking over the records of cases, I find that there have been a few individuals who had pronounced jaundice for years and yet been restored to normal health. 4. "In empyema of the gallbladder." 5. "In peritonitis starting in the right hypochondrium." The mere fact that there is peritonitis commencing in the right hypochondrium certainly does not of itself justify operation. It is almost impossible to believe that Mayo-Robson or any other surgeon would proceed to operate without assigning some stronger reason than this or that any medical man would consent to it. 6. "In abscess around the gallbladder or bile ducts, whether in the liver or under or over it." 7. "In some cases where although gallstones may have passed, adhesions remain and prove a source of pain and illness." This I regard as a legitimate field for operation, in which, however, the surgeon cannot always succeed. 8. "In fistule, mucous, mucopurulent or biliary." External fistule are rare, but the

patient may be benefited by operation. 9. "In certain cases of chronic jaundice, with distended gallbladder dependent on some obstruction in the common duct, although the suspicion of malignancy be entertained." If the patient is *in extremis* and no hope of recovery can be held out apart from operation, and a surgeon is found willing to undertake it, I know no reason why the medical man should object. 10. "In phlegmonous cholecystitis and gangrene, if the case be seen and recognized at a sufficiently early stage of the disease." 11. "In gunshot injury or in stab wounds over the region of the gallbladder." 12. "In suspected rupture of the gallbladder." 13. "In some cases of chronic catarrh of the gallbladder or bile ducts." Apart from gallstones, there are many causes of catarrh of the gallbladder and bile ducts, and if the medical man is at pains to find out and remove the cause of the disease, it is exceedingly improbable that in the course of a lifetime, he will ever hand over a case to the surgeon. 14. "In infective and suppurative cholangitis."

To sum up: 1. The importance of diagnosis and treatment in the earliest stages of gallstones cannot be too fully realized as complications may afterwards arise that will defy all treatment by physician or surgeon.

2. I am further convinced that the records of gallbladder surgery during the past years have clearly shown that the results anticipated have not been realized, and that, unless in the most exceptional cases, the gallbladder sufferer will derive more real and lasting benefit from hygienic and medical treatment than from operation.

POLYGLANDULAR DISEASE.*

Report of Case.

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My reasons for presenting this case to the members of the society are twofold: first, it presents certain unusual clinical phenomena; second, to create discussion and thereby make it possible to obtain some therapeutic suggestions which may be valuable to the patient.

The patient came to the clinic in March, 1917. He was then seventeen years and eleven months old; he was brought by his sister having been referred by the Rockefeller Institute. His complaint was that he was getting stouter and that his body was out of proportion to his lower extremities.

History of Complaint.—This condition started about five years ago when the patient's relatives observed that he was getting stouter gradually, although he did not eat any more than previously and in three years he assumed his present size. The cheeks assumed a dark red color, the hair began to grow over the forehead and he found that he was

*From the Department of Neuropathology of the New York Post-Graduate Medical School and Hospital. Presented at a joint meeting of the New York Neurological Society and the Section in Neurology and Psychiatry of the New York Academy of Medicine, January 8, 1918.

unable to walk much; that he had burning pains in the legs and feet and this was brought out much more distinctly in that his vocation necessitated some walking. At the present time he feels that he is very bulky, cannot get around very well, has occasional headaches, frontal in type. His hair does not fall out. He does not sweat much except in hot weather. Does not feel cold. Appetite not very good. Not



Fig. 1.—Patient at eight years of age.

thirsty. Has no polyuria. Has a feminine voice. Patient observed two years ago that while removing his trousers the terminal phalanges of the middle and little fingers of the left hand were contracted. This happened although the patient did not injure his fingers. It required some time as well as the aid of a splint to straighten them out. This has not recurred although the patient has observed that whenever he hurts any part of the body, no matter how slightly, a blue mark remains. He has also noticed that the left foot curves in at times and appears longer than the right one. This went to such a form that it was necessary for him to have his leg put into a brace. He wore the brace for four months and as soon as he discarded it the same feeling returned. He states that he sleeps well, but at times is restless. Never had any convulsions.

Family history.—Father, born in Russia, dead, cause unknown. Mother, forty-three years, born in Russia; here twenty-nine years. Married twenty-four years. No consanguinity. Healthy. Family histories as far as can be ascertained are negative for epilepsy, insanity, criminality, etc. There are two girls, both older than the patient, born in the United States, graduated from the public school; are intelligent workers. Healthy. The patient is the third child.

Personal history.—Mother well during gestation. Normal birth, never had convulsions. Patient breast

fed for about one year. He weighed six pounds at birth and seemed normal. First teethed at nine months. First walked at sixteen months. It is not remembered when he commenced school, but he graduated from school at fourteen years with an honor medal out of a class of 138 pupils.

Illnesses.—When a child the patient had measles, six years ago he had an attack of sore throat and severe tonsillitis. No other diseases. **Habits.**—Appetite poor. Sleeps well; restless at times. Does not smoke. No sexual desire. Very clean about his person. Takes one cup of coffee each day. **Physical examination.**—Patient was examined in the clinic and admitted to the hospital where he stayed from April 2nd to to May 8th, returning bimonthly until last month. **General appearance.**—Well nourished but under developed skeleton with round fat chubby face. Excess of fat under the chin, over the chest and abdomen. Poor musculature of the arms and legs. Good color. Voice high pitched. Slender tapering arms and legs. Hips somewhat flaring and thighs curved. Skin. Heavy growth of fine dry black hair that comes down over the temple region almost to the eyebrows. Downy hair covers the back. Normal amount of hair in axilla. Transverse crines pubis. Absence of hair on chin and growth on upper lip. Skin warm and dry—rather scaly. It shows a marked folliculitis. Over the legs from the knee to the ankle along the shins are large purple blue areas. No loss of superficial tissue. **Head.** Well formed. Circumference, 53 cm. Bones of skull and face well proportioned. Slight injection of conjunctivas. Pupils. Left slightly larger than the right. Both react to light and accommodation. He has a good crop of hair growing low over the forehead and gives the forehead very little area; somewhat the shape of a trapezoid. **Nose, Ears, Mouth.** Normal externally. No mastoid tenderness. No discharge. Mucous membranes of good color. Tongue clean. Teeth in good condition and clean; one filled. **Neck.** No rigidity. No glands palpable. No enlargement of thyroid and no pulsations.



Fig. 2.—Patient at sixteen years of age.

Thyroid much enlarged, lobes hard, upper anterior and posterior diameter increased. Vocal fremitus normal and percussion note vesicular throughout the whole chest. Breath sounds vesicular throughout. No râles. Retrosternal dullness. Heart. Diffuse impulse seen and felt in the fourth interspace. Some subternal dullness. Liver extends to

the fourth interspace. Heart rate normal. Regular in force and frequency. Sounds are of good quality. No murmurs or accentuations. *Pulse.* Fair tension and equal. Vessel wall palpable. *Abdomen.* Rounded, soft. Marked increase in panniculus. Prominent lateral abdominal veins. No rigidity. No masses palpable. Liver is two cm. below C. M. Spleen not palpable. No costovertebral tenderness. Kidneys not palpable. *Glands.* No superficial glands palpable. *Genitalia.* Infantile. Both testicles descended. *Reflexes.* All present and of normal activity. No clonus. *Extremities.* Bony structures underdeveloped. Poor muscular development. No excess of fat. Fingers all taper from proximal phalanx. The little finger is markedly shorter than the others. *Measure-*

foot from external malleus to tip of little toe 18.5 cm.

The patient was put on a purin free diet and the various laboratory tests were done as well as fluid intake and output measured.

Report of chemical examination of blood.—Date of report, May 1st, 1917. Creatinine 2 cc. Calcium 10 mg. per 100 c. c.

Report of examination of blood.—Date of report, April 15th, 1917. Erythrocytes, 4,720,000; hæmoglobin, 70; polynuclears, 82; leucocytes, 10,600; lymphocytes (large) 3, (small), 15; megoblasts, 5.58.

Report of examination of urine.—Date of report April 7th, 1917. Phenosulphophthalein test specimen for second hour, 310 c. c. mgs., drug forty-eight per cent. Total elimination, forty-eight per cent.

Report of chemical examination of blood.—Date of report, April 7th, 1917. Nonprotein nitrogenous constituents: creatinine, 2.2. Miscellaneous constituents: sugar, 0.132. Diastatic activity equals 14.9.

Report on complement fixation test for syphilis.—Negative.

Report on examination of urine.—Date, April 4th, 1917. Functional sugar test: Amount of sugar administered, 150 grams glucose in tea. Urine excreted first hour, 18 c. c., .6% sugar; second hour, 21 c. c., 2% sugar; third hour, 26 c. c., 2% sugar; fourth hour, 26 c. c., 1.6% sugar.

Date of report.—January 8th, 1918. Calcium, 9.6 mg. per 100 c. c.

Hearing normal. Biering tests normal. Eye grounds normal except for narrowing of arteries—arteriosclerotic.

X ray examination reports.—"A radiographic examination of the skull shows the sella turcica very small, the posterior clinoid process wide and indistinct in outline. There is, however, no evidence of erosion. There is also an unerupted canine; the unerupted molar is transverse to its usual position." "A radiographic examination shows distension of the anterior joint spaces of both knee joints somewhat more marked on the right side. There is no irregularity in articular outline. The findings are those of a synovitis."

Urinary examination gave an amber color, specific gravity ranging from 10.10 to 10.23, amount from 1,050 to 1,500 c. c. No sugar until the 4th of May and no albumen until the 4th of May. No albuminuria and no glycosuria was observed until the 4th of May. When pituitary extract of anterior lobe was injected intramuscularly, and on that day appeared sugar in the urine ranging thereafter from .83% to 1%, albumen being present in faint traces. The maximum blood pressure was 220 systolic, 155 diastolic; the minimum being 160 and 80. Two cc. of pituitary extract of anterior lobe were injected, followed in twenty minutes by one cc., and the pulse, temperature, and blood pressure were taken every fifteen minutes for one and a half hours and then every half hour for two hours. After the first injection there appeared within fifty minutes a fall of ten mm. of Hg., and after three hours the systolic pressure was 220, the diastolic 150 with symptoms of dizziness which lasted for four hours.

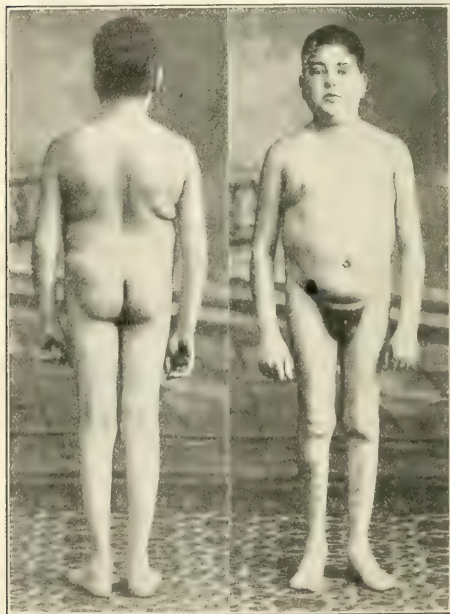


FIG. 3. General appearance: Adiposity limited to head and trunk.

ments. Body length (standing), 143 cm.; height of shoulders, 119 cm.; diameter about forehead, 53 cm.; neck, 32 cm.; chest, 91.5 cm.; abdomen—greatest diameter, 88 cm.; at umbilicus, 83.5 cm.; from sternal notch to umbilicus, 34 cm.; from tip of the acromion to tip of coracoid process of ulna, 29 cm.; from tip of the acromion to tip of styloid process to ulna, 49.5 cm.; from level of the styloid of ulna to tip of longest finger, 17.5 cm.; from tip of greater trochanter to upper edge of patella, 35 cm.; from sternal notch to ensiform, 18 cm.; from sternal notch to upper edge of symphysis, 46.5 cm.; from tip of greater trochanter to external malleus, 72.5 cm.; from internal malleus to tip of big toe, 19.5 cm.; calf 10 cm. below upper tip of patella, 25 cm.; ankle 30 cm. below upper tip of patella, 17.5 cm.; testes 1 cm. in diameter; penis about 4 cm. long;

The temperature at the maximum point of pressure went down two tenths, the pulse going down from 100 to eighty-three at the maximum pressure. Twenty-four hours after the first injection the systolic was 180, diastolic 120, pulse 120 or in inverse proportion. No thermic reaction was observed.

It must be borne in mind that the glycosuria and the albuminuria immediately followed the injection of pituitary extract (anterior lobe and persisted daily after that. No definite ratio was obtained between the fluid intake and output, such figures as these resulting: intake 600, output 375 cc.; intake 600, output 900; intake 1,040, output 970; intake 600, output 1,140; intake 840, output 1,350; intake 1,000, output 1,770. After the injection the intake was 1,240, output 1,500; intake 1,300, output 1,050; intake 2,240, output 1,495; intake 1,410, output 1,140. As observed there was some polydipsia and polyuria after the injection, but a distinct glycosuria and albuminuria.

It appears to me that this is a case of polyglandular disease and that we have a condition suggesting a disturbance of five of the more important glands of the endocrinal system. We must of course bear in mind the so called classical Fröhlich Syndrome which is defined by Dana "as a disease of the pituitary gland characterized by stunting of growth, adiposity, and hypoplasia of the genitals." Cushing defines the syndrome as an expression of infantilism of the structural and sexual associated with adiposity of the juvenile type and hypophyseal tumor. (According to Dana's definition as well as Cushing's we have here not a typical Fröhlich with its well distributed adiposity, but adiposity limited only to the head and trunk.) Marburg divides cases of Fröhlich syndrome into: simple adiposity; adiposity with genital atrophy, and simple genital atrophy.

Analysis of our findings brings these facts to view: the sudden onset of adiposity limited to the face and trunk, hair well grown from the eyebrows to the temporal region, hair over the back, flushed thymus, high blood pressure 185-120, underdevelopment of the extremities, tendency for ecchymosis to form easily, underdeveloped genitalia, tapering fingers, drowsiness, easily fatigued, pains in the back and legs, and certain degree of asthenia, lack of sex vigor, and feminine voice. Face, dry skin, a certain amount of dullness persistent.

Suggesting hypopituitarism we have the adiposity, tapering fingers, underdeveloped genitalia, and small sella turcica, as evidenced by the Röntgen gram. Pointing to adrenal disturbance we have asthenia, tendency to bleed and hypertrichosis. Regarding the thyroid we have the dry skin, puffiness of the face, and certain amount of dullness. As to thymus, there is a certain amount of retrosternal dullness. By fluoroscopic examination a persistent thymus was made out. Referring to a disturbance of the parathyroid we may think of the increased coagulability of the blood and increased calcium content.

Cushing found in his experience that in conditions of hypopituitarism the testes are small, secondary sex changes are absent, there is an insufficiency of the adrenal and hypoglycemia. Histological changes in adrenal tissue show abnormal vacuolization (lipoid change) in the cells of the zona

fasciculata of the cortex. The thymus is persistent as a rule. In cases of hypophyseal insufficiency there is apt to be a persistent and enlarged thymus when the process dates from the preadolescent era.

Cushing found after an injection of pituitary extract (anterior lobe) an increase of from one and one half to two degrees in temperature. As far as I could find in the literature there is only one case quite similar to this under discussion. This is reported by Cushing in his book on *The Pituitary Body and Its Disorders*, published in 1910. He tells of a young girl twenty-three years old who was referred to him because she began to take on weight suddenly. The history showed that menses began at fourteen years and came at regular intervals for seven years when it stopped. The patient got a temperature, headaches, pain in the back and swelling of the feet. Her vision began to fail and periods of diplopia, nausea, and vomiting began to occur associated with more severe headaches. She became stout gradually and in two years acquired twenty-five pounds. There was a falling out of the hair of the scalp, insomnia, tinnitus, and extreme dryness of the glands, asthenia and pain in the back. In this case there was a tendency to hemophilia, the skin bruised easily and large spontaneous ecchymosis occurred frequently. Pricking of the ear caused wide subcutaneous extravasations and pigmentation. There was a fine growth of hair over the forehead and cheeks. The adiposity was limited to the abdomen and was painful. There was a slight thermic reaction to pituitary extract (anterior lobe) injection of two grams with sensation of warmth and perspiration. There was evidence of pineal disturbance as was shown by the hypertrophic genitals, hypertrichosis and low grade hydrocephalus; thyroid was enlarged. Adrenal, extreme pigmentation, asthenia, high blood pressure, tendency to bleed, possible hypertrichosis, in which case as in Cushing's there was evidence of pituitary, thyroid, thymus, and adrenal disturbances together with parathyroid. Here the adiposity is limited to the head and trunk whereas in Cushing's case it was limited to the abdomen.

Etiology.—The etiology in this case is rather obscure, but the sore throat that the boy had a year previous to the onset ought to be borne in mind, also the fact that this condition had its onset just at the beginning of adolescence. There is no history of severe trauma. There is no question of a congenital condition here as evidenced by the photograph that shows the boy when he was eight years old.

Treatment.—The patient has been having pituitary extract tablets, two grains three times a day, for six months prior to coming to our clinic and was on thyroid from April 2d to May 3d without any apparent result except that he lost one and a half pounds in weight. The Coolidge tube was applied to the neck with the purpose of reducing the size of the thymus but without any apparent result. From May 3d to May 8th he was given forty-five grammes raw pituitary daily, then fifteen grammes daily. From May 26th until one month ago he received seven and one half grammes daily. No beneficial results were observed.

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Our Readers' Monthly Prize Discussions

These competitions, which have now been running some fifteen years, will henceforth be discontinued, as a very wide field of medicine has now been covered and the exigencies of war necessitate economy in space.—EDITOR.

The prize of \$25 for the best answer to Question CXCI has been awarded to R. S. Robertson, M. D., of Brooklyn, New York, whose paper appears below.

PRIZE QUESTION No. CXCI.

WHAT KIND OF FEET MUST A SOLDIER HAVE?

By R. S. ROBERTSON, M. D.,
New York.

A soldier should have absolutely reliable feet at all times, under all conditions they must be such as to become still stronger and more pliable with constant walking and hours of exertion. He should not develop limping and short steps because of stretching arch supports which means that as a civilian he has not worn ample sized shoes, so that he now has cramped or crooked toes or suffers from bunions. The present army shoe corrects many deformities, but a soldier will always pick those out too short or too narrow if his commanding officer is not on the alert.

No two pair of feet are alike and no type can be described that may be called typical or exactly proper. For instance the Indian with his foot shaped very like, to judge from external appearance, the foot of many Hebrews, could not be supplied with a better foot and the Jew with a worse one. The general plan of a model soldier's foot can only be sketched, and this plan will cover all good feet capable of much marching.

First: The size, that is, length and breadth must be proportioned to body weight and height. A short narrow stocky foot will never carry a heavy sergeant with his proper vertical line of carriage entirely too far forward without putting an abnormal strain on all of the foot ligaments. Second: The foot should not be *muscle bound* but all of the ligaments strong and yet elastic. Some free movement to each side without discomfort, and ability to extend the foot should not be hampered by a short tendon Achilles. Likewise toe jumping without loss of equilibrium or pain indicates sufficient length and elasticity of the tendons and both arch ligaments. A proper foot can be brought to an angle of less than ninety degrees with the leg. It is a sign of a muscle bound foot if impossible. A foot pronated and rotated outward means that the normal condition is reversed, and that the body weight does not fall as squarely on the ankle joint and ball of the foot as Nature intended. This splay foot gets worse under a heavy pack and the posterior arch begins to weaken. Discomfort may even be noted high in the calf at the insertion of the muscles unduly called into play by the extra movement necessary to hold the balance. This is followed by a loss of the normal anterior-posterior arch, and, ultimately, reaches the greatest degree of flat foot. Some feet have a low arch and broad imprint and yet are perfectly capable of foot exercises and do not break down. These are exceptional, but do occur, and many are wrongly diagnosed as diseased

or flat feet. Third: A flexible anterior arch is indicated by wide apart, smooth, straight toes and on the ball of the foot there are found no corns or callosities. They may be caused by short tendons or the constant action during walking of a twist inward of the above mentioned externally rotated foot as he rises on his toes to propel himself onward. It is a sign not to be neglected, and hard to remove. Cramped or over lapping toes may be due to narrow shoes worn in early life. Fourth: Toe corns are likewise a serious disadvantage when noted in a line across the bases of the toes or the second joint. Fifth: The outline of the sole varies greatly. A fat foot will often give a wide mark externally and may feel to be down under the arch and yet not so. Yet a wide imprint between toe and heel is, important, a defect signifying trouble, especially if the man knows there is something *there not quite right*. Congenital or deformities as the result of disease or injury have no place or consideration under the subject in question. The army wants fighting men, not cripples.

Dr. Melville A. Hays, of New York, writes:

The old saying "an army marches on its belly" is literally true to a certain extent, but the fact will always remain that an army really marches on its feet, *i. e.*, the speed of a marching army will be regulated by the speed of a number of stragglers and other slow marchers. Much of the straggling is due to sore or crippled feet which in turn are due to the previous wearing of improperly fitting shoes; improper shoes produce corns, bunions, calluses, hammer toes, tender joints and other injuries or defects which seriously impair the walking power of the man. There is as much difference between the normal physiological shape of the human foot and a foot which has been jammed and forced into many of the various styles of narrow pointed shoes of the present day as there is between day and night. The normal foot is long, broad across the base of the toes, with freely movable joints, a fairly high instep, and a good arch; it is so balanced that in walking the weight rests on the outer edge of the foot and heel and across the base of the toes. The military foot should be long, broad, with freely movable joints, free from hammer toes, varicose veins, corns, bunions, tender joints, callused spots on any part, and should have a good high arch and a well supported instep.

The present draft regulations permit the acceptance of men with some of the defects mentioned above, provided they are not of such degree as to impair walking or weight bearing power, but in my opinion, unless these defects are of such slight degree as to be easily remedied, they are certain to impair the walking or weight bearing power of the man.

Medicine and Surgery in the Army and Navy

THE CARDIOVASCULAR PROBLEM OF THE DRAFT*

By HARLOW BROOKS, M. D.,
New York,
Chief, Medical Service, Camp Upton.

When in the militia and as a recruiting officer for the regular army, the cardiovascular problem in the work of the draft boards was supposed to be a very important one, and perhaps one in which it was expected the deficiencies of the draft boards might reasonably be expected to be found most evident as compared with army requirements.

In general it may be said that this has not proved to be the case, for it is not in regard to heart examinations that we have found the greatest number of errors, though there has been very great variation in this respect as regards the work of different boards. It was impressively and concisely put by a colleague who said, "Show me the rejection rate of the draft from any board and I will tell you just the brand of patriotism of its members." The work of some of the boards has been so carefully, so conscientiously and so altogether patriotically done, that it has not been possible to reject a single recruit sent to us. I would not, however, lead you to infer that a rejection by the army examiners need in any way be a reflection on any board. In many instances the examiners of the local boards had no real knowledge of the requirements of the service and many of them doubtless feared too high a rate of rejection, or being outplayed by malingerers and the numerous breeds of slackers.

None the less this does not excuse the sending to us of men presenting pulsating aneurisms, palpable enough through eroded thoracic frame, nor does it excuse the inclusion of most evident and pronounced cases of congenital cardiac disease, not a few of which were sent to Camp Upton. However, we have these men to thank for some of the most interesting cases which have entered the Base Hospital or come to our attention as members of the Cardiovascular Board.

Accepting the experience largely of the English, Canadian and Australian medical officers, from the very outset much less importance has been placed on the existence or nonexistence of cardiac murmurs in the examination of recruits for the National Army. One no longer rejects a recruit simply because he has a heart murmur, in conformity to army regulation. Though at first a dissenter from this ruling in my own mind, perhaps largely from habit and from former military custom, I have been won over to this newer and far saner viewpoint as a result of my personal observation of the effects of training in these cases; a training which, in the Seventy-seventh Division, has been a severe one. The British authorities have found that battle data bore out these findings absolutely, and I have no doubt whatever but that our experience in this respect will prove the same. This is particularly true as regards

systolic murmurs at the apex and especially those of the cardiorespiratory type, even in many instances of unquestioned mitral incompetence. Reexamination of many of these cases, in which we of the Cardiovascular Board have had ample experience, has shown that the regulated life and systematically administered exercise of military training, severe though it be, is followed by great symptomatic improvement and often by the complete disappearance of the murmur. After all, as we have long suspected, it is not so much the question of the valve lesion as of the heart muscle, that is fundamental to the prognosis.

This is even more true of systolic murmurs at the base; only a very small percentage are due to actual stenosis of the aortic valve or ring. Most are haemic, functional or not explainable on an organic basis. And a very large number of them disappear in the course of the recruits' training.

The army places its final and most important decision on the question of the ability or disability, as the case may be, of the heart to perform its duty. It is on this ruling, the sense of which I am certain, appeals to all of you, that the examiners at home and those at the camps have most differed. We have a great advantage over you. In testing the possibilities of a heart, we are not obliged to be content with the simple tests of the office or clinic, but in questionable cases we may send a man to full duty, to work in the trenches, or to bayonet drill. Even on the hike, or at his games, the questionable man is under observation usually entirely unknown to him, and his reaction to exercise is carefully reported to us by the regimental medical officers. This measure has not only enabled us to exclude a good many cases which present no murmurs and, in the casual examination, few evidences of a defective heart action, but also to retain in the service many who, because of a single sign or perhaps some simple curiosity in physical diagnosis, might otherwise have been considered unable to serve their country in this honorable calling. Most pleasing of all it has enabled us to detect a considerable number of malingerers who through the use of drugs or in other ways have succeeded in deceiving their medical advisors and friends, and sometimes I almost believe, themselves as well. The functional test is the thing. It has been very carefully worked out by the R. A. M. C. of the British and we are profiting to a very enlightening degree from their experiences.

Questionable cases are of course taken to the hospital and we are permitted to retain them there where we have practically all the modern facilities for determination of cardiac efficiency except the electrocardiograph.

It is this pioneer field of functional diseases of the heart that gives us our gravest concern in army work. The absence of landmarks and guide posts makes our task like the blazing of a new trail. Following out the experience of every one, we are finding that the experimental test is the most decisive road to an understanding of this undefined class of cardiovascular diseases. This field, so largely in-

*Read before the Medical Association of the Greater City of New York, January 21, 1918.

accessible to the physician on the draft board, is one in which we on active service have preeminent opportunity, it is the one in which we most disagree with the conscientious work of the patriotic draft boards, and it is in this field that we wish to emphasize the importance of heart efficiency and the secondary importance of cardiac peculiarities.

THE ARMY MEDICAL MUSEUM.

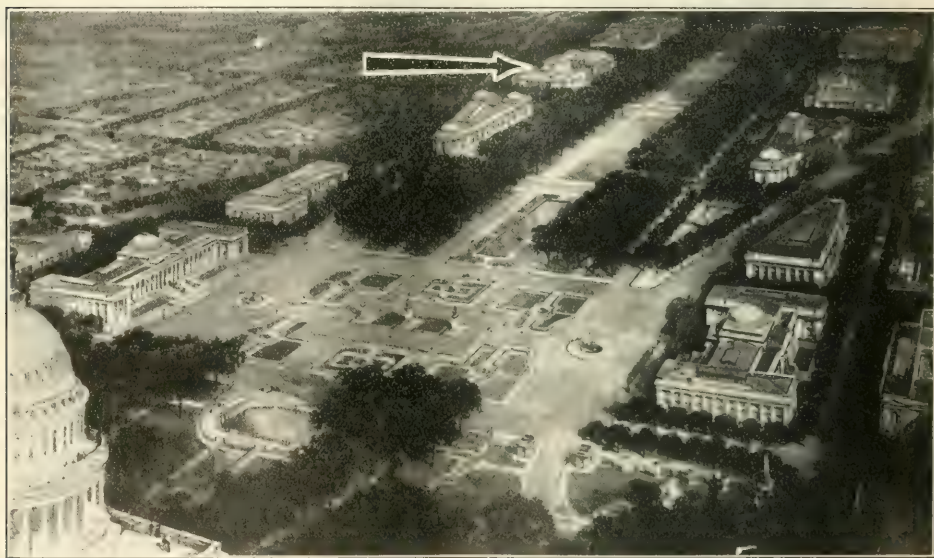
By W. O. OWEN, M. D.,

Washington, D. C.,

Colonel, Medical Corps; Curator, Army Medical Museum.

When thinking over the museum and this great library, it has come to me by slow degrees that the three years of European war will have crippled seriously the medical schools of France, Great Britain, Italy, and Germany. At the beginning of the war

medical men to care for the armies and civilian population. Thus, the United States finds itself in the position of being the only large country in which medical education has not been seriously crippled. For these reasons, I believe that it would be the part of wisdom for the United States to prepare deliberately to become the leader in medical education, so that the world may turn to the United States for medical education on account of the great facilities which shall be extended to the profession for the higher studies. I believe, also, that the Medical Museum, of which I am now curator, is the logical centre of medical education, and that medical material, anatomical and pathological, should be collected here during the present war. Books coming to the Library of the Surgeon General's Office will present pathological and anatomical data gathered by operative procedure and post mortem examination and clinical histories of individual cases, with



Bird's eye view of the Mall, Washington, D. C., as planned by the Fine Arts Commission. The arrow points to the site proposed for the Army Medical Museum and Library.

Great Britain and France refused to exempt their medical students, with the result that in two years they were compelled to take their medical students from the fighting forces, in order to try to revivify their schools, which were being destroyed because of the insufficient supply of medical men and the lack of oncoming graduates and teachers. They have since made strenuous efforts to undo this evil in the disruption of their medical and other scientific schools. Fortunately, the United States has made partial provision for its medical and dental students, so that the colleges will not be seriously crippled from this cause, although first year students are not yet exempt. We have tried to conserve the medical personnel in order that we may not, at the end of the war, be in the position in which the European countries find themselves, namely, without sufficient

moving pictures taken before, during and after operation, and during aftertreatment, etc. All this will be collected under one roof, where facilities for the collection and redistribution of this material may be well nigh perfect.

No verbal description of a spasmodic seizure can equal that of the rapidly taken motion picture, particularly when the picture is taken against a background of tessellated floor and walls, with a time clock which records small divisions of time and distance. Every movement of the body is thus charted both for distance and for time, so that an ultimate analysis may be made. A study in which, with the pathological material, microscopic findings, and clinical history at hand, the student could throw upon the screen the moving picture and then analyze it, for time and distance, would be of the

greatest value. It ought not to be very difficult to slow down these pictures by printing them tandem, so that one might tell accurately and precisely what is to be done and what would give the best results for the patient. The instructor might take a moving picture of a typical case with his original and confirmed diagnosis. This, with the clinical facts, could

careless, indifferent, or ignorant hands may not reach it; where only skilled hands and skilled brains may be allowed to touch it; where the instruction given by the individual man who had prepared the material had been followed; and where his responsibility would be respected and honored. This institution should belong to the profession of the world,



FIGURE 1.—Architectural rendering of the proposed Army Medical Museum and Library.

be transmitted from place to place, so that new studies and comparisons with other moving pictures might be made. With material collected in this way, and proper laboratory workshops where advanced students may come for postgraduate study of specific material, there should be no reason why the museum and library may not be converted into a university in which the students themselves shall be the teachers of medicine of the United States and of all the world.

Here could be filed the result of their labor for leaving the Surgeon General in control, allowing him to appoint the custodian or curator of it as he always has, and working with a commission chosen by the profession to guide and assist him.

It is proposed to ask Congress for an appropriation with which to build a new museum and library, where these great collections may be properly housed and exhibited. The library of the Surgeon General's Office is one of the great clearing houses of medical knowledge of the world. All of the important medical literature of the world comes to it as it is pub-



FIGURE 2.—Army Medical Museum and Library, Surgeon General's Office, Washington, D. C.

their own future study, as well as for those who come after. This museum should not be merely a collection of the medical history of the United States, but it should also be a teaching centre in the truest sense. It should be a place to which the medical man should turn for study and might feel that he could send his most prized pathological material for careful and reverential preservation, where

lished, and is carefully indexed: all this material is available within thirty to sixty days after it is published. Why may we not have a great pathological library here, where all of the pathological material may be centred, carefully indexed, and the index published within from thirty to sixty days from the time it is received? Take these two medical educational institutions, the museum and the library, house

them in one great building on the Mall in Washington—surely such an institution is worthy of the very best that can be built. In this building found a great national medical school. Let the school have professors at proper salaries selected by the medical faculties of the United States. This should be one of the honors to which medical men may attain after having earned the high opinion of their medical brethren as accurate observers of fact and diligent searchers for truth. Let this become to the medical profession of the world—for this should be open to all the medical men of the world—what the Supreme Court of the United States is to lawyers of the United States, one of the highest pinnacles of achievement. Such a museum and library with such professors would be a great educational force for the teacher and would rapidly become the greatest medical centre that the world has ever known. To it all the selected pathological material will come, and from it would flow a continuous stream of high class medical work, leading to the increasing betterment of medical practice and the health of the people.

I know one noted surgeon who has the clinical history of every cancer operation he has performed, the pathological specimens themselves, the blocks from which the slides were made, and the slides upon which the microscopic diagnosis depended. He has the life history of the majority of his patients and he has tried to get it all. He has promised this museum this material, if we get a new home for it and the library. I know others would speedily follow. Would not such a collection of cancer material, under the direction of a carefully chosen man to guide the studies, be of assistance in solving this great question of modern medicine? Is not the same true of every other branch of medical study? Why may not a medical museum be a school, a place in which public exhibit should be made of material of true teaching value to the public of the many ways they may render themselves happier and more efficient, as well as a place for the serious study and assistance for medical men and medical students? A collection which is intended for the study by experienced students should never be exhibited to public view, but should be indexed and filed away and only taken from the shelves for serious study.

Think how valuable this institution might be made to the profession of the world, if, at the centres where one disease was common, specimens were taken and distributed to a locality where some special complication prevailed, and exchanged with others where this particular complication was not common. It would be of inestimable value to science if this museum should have the individual specimen upon which some new discovery had been made, taken by the discoverer himself, together with slides prepared by him, with blocks from which the slides were to be prepared, so that other men might study the exact material upon which he had made his original diagnosis.

This museum should be housed in a building with a dignity commensurate with the service to be demanded of it. Accompanying this article are some pictures of the building in which I would like to see the army medical museum and library housed. I present a picture of the Mall in the "new city beau-

tiful," Washington, when the Building Commission and the Fine Arts Commission shall have been able to realize their dreams. I have marked on this picture where I would like to see this museum placed, and have some reason to believe it may be done. The Mall is to have a museum and educational buildings of the character shown in this bird's-eye view of Washington. Last year, I proposed to the Surgeon General a building and floor plans in accordance with the accompanying pictures. It will be noted that I have provided a place where large groups of medical men may meet, small rooms where expert medical men may come to study pathological material, collected by themselves or by this institution; where they can have future studies made of the material that they are studying; where the books they desire, which contain the history of a particular study can be instantly available; where the collection of slides and moving pictures may be thrown upon the screen for them to study; where expert assistance will be available to relieve them of the details, so that their intelligence may be concentrated upon the main points of their studies.

The museum of 1861-1865, and later, was all that could have been hoped for in that day. I am trying to make preparation for the study of medical material of this war upon a modern, scientific basis. I am trying to provide facilities which only the national Government may place at the disposal of scientific men of the present day, to the end that medicine may be advanced by the study of large groups, where community studies may be developed, and where individual jealousies may be wiped out, and men really and truly assist and guide each other toward the common end of attaining the truth. I do not believe that a mere collection of anatomical and pathological curiosities for exhibit to the curious and the prurient should be permitted. A medical museum should be, in my judgment, a great library of history and pathology, where the student of medicine may come and study the history of disease and its pathology, for the benefit of himself, his patients, and his nation. Otherwise, there can be no good purpose in a collection of this material that is worthy of the endeavor of any honest man.

MEDICAL NOTES FROM THE FRONT.

Conservative Surgery.

GENEVA, February 20, 1918.

Conservative surgery should leave a man with the injured limb, or the major part of it, and see that it possesses future usefulness. The functional result is the essential point which, above all, must interest the conservative surgeon, but in order to attain results, surgical interference of a proper kind must not be refrained from, because abstention is not the synonym of conservatism. Some interference will be necessary in the vast majority of war wounds, and particularly in those resulting from bursting shell. Conservative operations are here in order, such as free exposure of the entire wound, removal of bits of clothing, the missile, if possible, and drainage. Later on, sequestromy, curetting, and finally surgery of repair.

It is only with great patience in carrying out these

economical interferences that a useful limb may be given to a man. Calot has propounded two fundamentals in conservative war surgery which it may be well to give: Never remove sequestra or pieces of bone until the lapse of a fortnight or twenty days following receipt of injury. This does not imply that one must not remove small bone splinters, derived from periosteum, which may be found loose in the wound. They must of necessity undergo necrosis, and therefore should be removed. A conservative operator must not, on the pretext of completely cleansing a wound, make the mistake of searching for free bone splinters down to the fracture focus, because by so doing the bone will be deprived of the necessary material for consolidation of the fracture. On the other hand, in fractures of the diaphysis from missiles now used it often happens that long, narrow splinters are formed, holding to the bone by a strip of periosteum, and if systematic removal of all free splinters is practiced it will always be a temptation to remove those which are slightly adherent to the bone, when in reality if they are gently reduced they will act as useful splints between the fractured ends in the formation of the callus. But after two or three weeks, if suppuration continues to be free, and if radiography reveals necrosed sequestra, then it is proper to remove them.

Calot's second rule is, never to amputate except for gangrene. In injuries of the limbs there may be great tearing of the skin, muscles, vessels and nerves, but for none of these lesions taken separately is the question of amputation to be raised, even when there is a vast laceration of a vessel with hemorrhage. It is not wise to subject a patient already weak from loss of blood to an operation which, besides the added operative shock, will necessitate farther loss of blood, and three years' experience has shown only too often that many patients do not outlive their amputation. It is better to empty hematmata, ligate the bleeding vessel when possible, and, if not, ligature of the principal artery of the limb must be done. I know of one case where ligature of both tibials was done, and yet no disturbance in the limb resulted, excepting some little edema toward the end of the day after the patient had walked. When the bone is reduced to powder, or broken up into many bits; when we have what is aptly termed a "*puzzle fracture*," careful drainage and immobilization in some good splint, with frequent irrigation of the wound or Carrel's procedure, is the proper treatment to carry out. Radiography will give important data in respect to the bone lesions and the prognosis, and also in what direction pressure should be made in order to bring about coaptation of the splinters and bone fragments. Fractures just above a joint are particularly serious, as they are accompanied almost invariably by purulent arthritis. Too much stress cannot be laid against amputation or resection in these cases, because conservative surgery has shown that recovery may take place, in some cases, even without ankylosis.

The question of amputation is only to be considered when all the above mentioned lesions are present together, when there is crushing of the limb, or

an almost complete division of the member. Nevertheless, regardless of the seeming fearful condition of the crushed and lacerated soft parts and the state of the fracture itself, amputation should not be done in certain instances until conservative treatment has shown itself perfectly useless. Gas gangrene necessitates urgent amputation, but the diagnosis must be certain and the surgeon must not mistake an ordinary gangrene for the real gas process. He must also remember that small wounds are quite as prone to this as the larger ones, and therefore he should always be on the alert for it in all injuries. Amputation is absolutely necessary in septicemia and amyloid degeneration.

I now outline the treatment usually employed for preserving a limb, in order to retain as far as is reasonably possible its functional integrity. As soon as the patient is brought in (of course an antitetanic injection is given) the wound is cleansed with free irrigation with pure or diluted Labarraque's fluid, or with oxygen water, always remembering the accidents to which the latter may give rise. I refer to gas embolus, but this accident is in reality so uncommon that in practice it need hardly be taken into account. Oxygen water has been said to cause cell necrosis and to hinder the growth of granulation tissue, but this applies to about every known antiseptic. Oxygen water must be *neutral* in reaction, and always diluted. In the case of severe traumatism the limb is placed in a bath of some antiseptic solution enjoying the confidence of the acting surgeon.

When the wound has been adequately disinfected, drainage must be established. In infected compound fractures transosseous drainage must be made. A counter opening is essential. The use of iodoform or other gauze strips has been condemned, as they keep up infection, but they may have their use in open infected fractures by preventing a too rapid cicatrization of the soft parts, which would result in the creation of a bone fistula. Therefore, tightly packing the wound down to the bone with gauze will often be a useful procedure. In the employment of antiseptic dressings I would particularly mention dusting the wound with zinc peroxide as a very excellent method, and also that powdered boracic acid is very active against the pyocyanic bacillus. Individual idiosyncrasy must be watched for and a change made in the antiseptic with the first indication that the patient presents in this respect.

As to removal of the missile, it seems to me that as a general rule it can be said that a projectile, providing it is not too small, can be exactly located by radiography, taking it in two perpendicular planes, and should then be extracted, and this for several reasons. A missile in a joint or its neighborhood is a permanent menace. If purulent arthritis already exists it is of absolute necessity to remove the foreign body which is the causative factor of the suppuration. An accessible missile should be removed, for it may be the cause of late tetanus, and its presence in the tissues may give rise to pain later on, so that eventually the patient seeks its removal when it is not so easy to accomplish. When a fracture exists, it is imperative to reduce

the splinters and fragments of bone which are partially detached from the bone, at the same time as the fracture itself. We have a large choice in the selection of splints, but the Thomas apparatus is probably as satisfactory as any in the long run. Plaster casts, even when fenestrated, are not satisfactory in the early treatment of these fractures with open wounds, because no compression can be made on the sequestra at the point where it is required. However, in cases of suppurating arthritis a well applied plaster cast, with handles as used by the French surgeons, is effective.

After the lapse of about three weeks or more, conservative operations may be begun if required, such as curettement, sequestrotomy, etc., and by this treatment a limb may be saved which at first might have been considered as lost. But all is not done by saving a limb. Useful movements must be given it, and this can be done by movements of the joints not directly involved during the time that the wounded parts are immobilized, and at the same time to prevent ankylosis of the joint nearest to the fracture by early mobilization. Later on, massage and mechanotherapy will increase the amplitude of the movements. Massage is important in preventing muscular atrophy. If tendons have been divided they are to be sutured when possible, or, if not, an appropriate anastomosis is made. This is likewise the time to free nerve trunks embedded in a mass of cicatricial tissue or in a callus, or suture a divided nerve.

Conservative surgery has, however, its risks, the principal risk being to let the favorable time for amputation slip by, but this must not have an exaggerated importance in the surgeon's mind. Unquestionably, some patients have been victims to temporization, but the majority of wounded will profit greatly from conservative surgery. Among the drawbacks of conservatism is longer suffering for the patient, but this is only temporary. An amputation too hastily performed frequently results in a defective stump which will require being made over, a fact only too well exemplified by the work of Teutonic operators.

CHARLES GREENE CUMSTON.

MEDICAL NEWS FROM WASHINGTON.

A Medical Drive. The Real Aviator.

Some 7,000 more physicians are needed for the Medical Reserve Corps of the Army. The notice of the Surgeon General of the Army some weeks ago to this effect has been supplemented by the Medical Section of the Council of National Defense in an appeal to state medical societies for a "drive" to that end.

However, in this call of so many physicians to the army, there is danger of drawing too heavily from civil communities where doctors are needed for the preservation of the public health. It is realized that there is necessity for exempting from army duty a certain class of specialists, and particularly instructors at medical colleges, who will be required to maintain the output of graduates. Otherwise, the situation will be presented of a deterioration in the efficiency of the college faculties

and a corresponding adverse impression upon the fitness of graduates for military or any other work for which they are supposed to be educated.

This important and serious development of the situation was intended as the subject of discussion at a recent conference in the office of the Surgeon General of the Army, but it was decided to bring it up in a more comprehensive manner at the coming annual meeting of the American Medical Association at Chicago, June 10th to 14th.

It is appreciated, however, that it will not be possible to establish any rule in regard to an exempted class of physicians, since the individual, in the end, if he desires military service, will separate himself from any status that renders him ineligible, but the adoption and promulgation of a policy that shall create an exempted class in the medical profession, with a protection of personal pride and an exoneration from the suspicion of "slacking," will do much to protect the situation in the colleges now threatened with harmful results.

* * * * *

An interesting test was conducted recently with navy aviators under instruction at Pensacola, Fla., and Hampton Roads, Va., in an attempt to devise means of measuring qualities that should be possessed by those on aviation duty. The investigation had to do with certain characteristics regarded as indispensable in the aviator, and it was conducted by experts from the Harvard Psychological Laboratory.

As a result, and by virtue of independent observations on the subject, members of the navy medical corps that have been interested in aviation problems are of the opinion that too severe exactions of purely physical standards for aviators should not be made. It is urged also that more medical officers be employed on the problems of aviation, it being believed that adherence to certain physical requirements are operating to the detriment of the flying corps. It is insisted that rejection of candidates on account of certain defects, such, for example, as flat foot, deafness, a one fourth inch difference in chest expansion, and a minor difference in vision, are unnecessary. The tests included such factors as presence of mind, alertness, muscular coordination, mental alertness, judgment of distance and velocity, power of observation, unusual fearlessness in flying, and intelligence.

Assistant Surgeon R. P. Parsons, of the navy, who has been giving much attention to qualifications of aviators, says on the subject: "Our navy has already rejected hundreds of applicants because of trifling and minor defects, most of whom, it is safe to say, might have become successful aviators. It is a fact that a great many of these rejected men have been admitted to the Canadian flying corps, where they have made good to an extent that would, indeed, be disturbing to the medical officers of our service who rejected them. * * * The physical standard for our aviators should, of course, be as high as those for other branches of the service, but no higher; in fact, there are several defects, which, while constituting a definite handicap to a man in other branches of the service, would in no way affect his ability as an aviator."

Editorial Notes and Comments

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WHOLE MEAL BREAD.

That bread is the staff of life is now more fully
believed than ever. Since the commencement of
the war, bread has gained greatly in reputation.
Indeed, in many European countries, bread is the
staple diet of the civil population, and, to a lesser
extent, of the soldiers. Moreover, from motives
of economy, and from the knowledge that whole
grain bread contains more nutrition than bread
made from highly milled flour, regulations have
been enforced in the countries at war and in some
of the neutral ones that only bread made from
whole grain, or at least with a very large percent-
age of the grain, should be used.

In the milling of ordinary white wheat flour
only about seventy per cent. of the whole grain
was utilized. At the present time in Great Brit-
ain, it has been made compulsory for millers to
extract eighty-one per cent. of the whole wheat
grain in the form of flour. Thus the inner layer
of the pericarp of bran and some of the germ enter
into it. Regarded from a chemical standpoint,
such flour is decidedly superior to the old highly
milled. It is slightly poorer in starch, but incom-

parably richer in proteins, fats, mineral matter,
and last, but not least, in vitamins. The impor-
tance of the vitamine content can scarcely be ex-
aggerated. When food is lacking, or deficient in
the vitamine element and eaten for a prolonged
period, sickness will follow, as for example
scurvy, or, under certain conditions, beri beri. In
fact, it is now well understood that there are dis-
eases which are termed "deficiency diseases"
brought about by insufficiency of vitamins in
the diet. Of bread in western Europe made main-
ly from wheat and in this country from flour, the
question remains, is it as digestible as the old
time bread? A great deal of prejudice has been
created in Great Britain against the whole grained
because of its assumed indigestibility. The in-
creased phosphorus nuclein and vitamine content
has been belittled on the presumption that it is
largely indigestible and passes through the ali-
mentary canal unchanged.

However, Professor Freer, among others, the
director of the largest children's clinic in Switzer-
land, takes the stand by the side of Hindbede the
Dane, who lived for five months upon hand milled
bread and margarine and water and stated that
he never felt better. Freer emphasizes the abun-
dant organic phosphoric acid content and the
presence of proteolytic and amylolytic ferments
which continue to act after the dough has been
mixed and result even in a large assimilation of
the cellulose itself. In this connection it is in-
structive to note that the most recent investiga-
tions of Carl Voegtlin, G. C. Lake, and C. U.
Myers, of the United States Public Health Ser-
vice, published in the *Public Health Reports*, May
3, 1918, lead them to the conclusion that the total
phosphorus content of corn and wheat foods is a
fairly satisfactory index of the amount of anti-
neuritic vitamine contents in these foods. Which
really means that a high phosphorus content is an
indication that the particular corn or wheat pro-
duct is relatively rich in vitamins. Dr. Robert
Hutchison, the well known British food author-
ity, put the matter in a nutshell when he says that
on the whole we are justified in concluding that
there is nothing chemically injurious in the flour
from which "war bread" is made, and that any
ill effects from it can only be due to imperfect
grinding. When the grain has been thoroughly
ground into flour there are no chemical imperfec-
tions, and, unless the loaf undergoes chemical
changes after baking, there can be nothing wrong
with its composition. Thorough grinding of the

grain, and proper baking under good sanitary conditions, are essential to the manufacture of the ideal war bread. But even if the bread be slightly heavy, thorough mastication will overcome these drawbacks, but there are few reasons why the grain should not be completely ground into flour and made into well baked loaves, and then its nourishing qualities, its chemical purity, and the completeness with which it is utilized in the body renders it a food superior by far in all respects to bread made from highly milled flour. The need for thorough mastication alone serves to make it digestible. Mastication brings the salivary glands into action and, of course, thereby greatly aids in the smooth working of the digestive process. Again, bread made from whole meal flour acts as a laxative, and, in this constipated age, which has largely come about by universal consumption of smooth, soft, and pulpy foods, should be given due credit as a therapeutic agent of great efficacy. Freer has stated without reserve that adults eating whole meal bread properly made, and containing twenty per cent. of bran flour, are nourished as well as Hindbede was in his classical experiment, and without the need of specially robust digestive power.

SALARIES OF CANADIAN MEDICAL MEN IN OFFICE.

The ever increasing influx of medical men into municipal, provincial, and national service in Canada during the past few years brings into comparison not only the emoluments of private practice, but the entire range of salaries in all branches of public service. Is the medical man in public service receiving just recompense for his work? Is his work considered of minor importance? Is he looked upon as one eager for a safe berth?

It is well known to doctors that the rewards of private practice as a rule are negligible. Here and there one meets with a man who has been able to collect something for a rainy day; but quite often when he departs this life there is considerable surprise when his will is proved. Often they have an avocation, such, for instance, as life insurance; and there are not many without some income other than that derived from the pure practice of medicine. Practice there is, and accounts there always are, and accounts they always remain; collections are the essentials to the best financial success. Speculation, sometimes loaning on notes, sometimes loaning on mortgages—a little here, and a little there, to help out the precarious income. It would be an interest-

ing item if some statistician could only collate the uncollected accounts of physicians; city as compared to city; city as compared to country; country as compared to country. Surely the laity would be simply astounded at the uncollected, hardly earned monies of the toil troubled physician. The best asset is possibly the fact that one is engaged in a vocation where he is his own boss; that is, if one at the beck and call of everybody at all times can truly be said to be his own boss.

When the salaries of public officials come to be scanned in public documents, there is noted a discrepancy to the wrong side of the physician public official. Supposing he is a district officer of public health—those on a par with him, often living in the same town, crown attorneys, sheriffs, etc., fare much better through the public purse. If he is in a city, his salary does not measure up to the law officer of the municipality, the assessment commissioner, etc. If he is in provincial service, a party hack can pull down eight to ten thousand per annum, sometimes, when the educated physician, saving untold lives and preventing many illnesses, can scarcely gather in five thousand. A flagrant disregard of long service is often seen in a new appointee receiving more than he who has been constant in duty many years. Numerous cases could be cited in verification. Often, too, he is harried and seared by captious criticism of his work in the public interest by those who know nothing about it.

Many prominent and capable medical men left large practices in Canada at the outbreak, or very soon after the declaration, of war. They had already made a name for themselves—had a national reputation, and were in receipt of comparatively large incomes. It cannot be asserted they were after the coin; nor the experience. Others, in various walks of life, joined up, often retaining their salaries in public positions, or parts of them, or were paid in full by their employers. Can there be any comparison between those on the one hand and the physicians who resigned all?

There has never been any complaint of the technical work of the Canadian Army Medical Corps, or the hospital surgeons and physicians who went abroad, or overseas. On the other hand, there has been unstinted praise; the facts bearing out that praise, and statistics proving the invaluable service rendered by sanitary scientists, therapeutists, and surgeons in all the specialties. They, collectively and individually, have proved the worth of the Canadian medical men. Public health officers are today, also, proving their worth, if the people can only be brought to see it. No longer can the work of the physician in state

service be classed as lower in the scale than that of his more fortunate associate in other branches of state service, financially. The discrepancy in his salary is glaring in the limelight of the worthy services of his confrères. With the abolition of party patronage in Canada—the curse of any democracy—public service will be based upon competence, and from that foundation there shall be built a state service of evenhanded justice.

FAULTS IN OUR SYSTEM OF TRAINING NURSES.

The demand of the army for nurses is draining trained nurses from civil hospitals and from private practice. The proposal of Doctor Goldwater that provision be made for training volunteer nurse aids in the nurses' training schools, while good, does not go far enough. The trouble is fundamental and to cure it would involve a complete revolution in our nursing curriculum.

The present system of training nurses is radically wrong in three respects. The length of time spent by the pupils in training is too long and the cost of the training to the hospitals is too high. If the curriculum for the trained nurse were dissociated entirely from the question of maintenance for the nurse and was placed upon a businesslike and at the same time scientific basis, it would be found that two years would be ample in time to train a nurse for registration.

Such a curriculum would require more hours of study by the nurse, a better type of instruction than is given in many institutions, and would involve a greater outlay than is usually allotted for the conduct of the training school. For this instruction the nurse should pay a moderate fee. The training school should not be required to house or feed the pupils without charge. The best solution of the problem might be the requirement that the pupil should pay for her board and lodging at about cost to the institution, and pay a fee equivalent to about the cost of maintaining a teaching staff, being in turn paid for the number of hours of service rendered to the institution; the rate of this pay being changed every six months commensurate with the value of her services.

A somewhat similar method is followed in some of the State agricultural colleges. There tuition is furnished free by the State, the pupil pays for his board and lodging at actual cost, and this is very little, and is given an opportunity to put into practice what he is being taught, by laboring in the fields, the hot houses, the gardens, or the stables of the institution, and is paid by the hour for the amount of time devoted to doing this.

The advantage of such a general plan would be that there would be a clearer comprehension of the relation of the different phases of the nurses' training to each other and of the nurses to the institution.

Such a two years' course would afford ample time not only for the basic general training of the nurses but for specialization in the particular field in which the nurse proposes to enter.

One of the basic difficulties under the existing system is the confusion of issues brought about by the practice of paying nurses, or at least of supporting them during their tutelage. In order to recoup themselves for this expense, the hospitals require of the pupils much menial labor which should be performed by maid servants drawn from a wholly different class from that which supplies pupil nurses. Such a reorganization of our system of instruction would bring into the field a great many desirable pupils of superior intelligence who are now shut out of this work by a curriculum which involves an excessive amount of purely menial service.

Of late there has been much criticism of the tendency to expand the curriculum along purely theoretical and scientific lines which have no immediate bearing upon the duties of the nurse. Much of this criticism is undoubtedly well founded. But the main trouble with the curriculum is the confusion of issues which is incident to the erroneous system now followed of paying pupil nurses and making them earn this pay by doing menial labor ostensibly as part of the necessary drill.

'T WAS EVER THUS.

Thomas Hazard, an interesting writer on man' themes, merchant, and worthy philanthropist of Rhode Island, became an ardent convert to spiritualism, and in the *Providence Journal* of 1881 wrote of his relief, by "the laying on of hands" of a medium, from soreness in the ankle and heel (evidently from sprained arches). "I observed," he says, "that the medium generally manipulated my ailing heel until it perspired, and that when she commenced picking with her forefinger and thumb as if she were taking away some minute particles and casting them aside. Hitherto she had made no remarks on this point, but now, upon my questioning her, she told me that she was taking away little corn seeds that were imbedded deep in my heel and were brought to the surface through the action of the magnetic aura that passed through her arms, which I had noticed on several occasions were strangely and evidently painfully convulsed. On my asking her to let me see one of the little particles, she said they were mostly imperceptible to the sight. . . . At the last sitting the medium removed fifty of

the seed corns from my heel, her arms convulsively shaking and quivering violently whilst she was drawing them out or removing them." "Few persons," he continues, "can have any conception of the amount of cures of all kinds of complaints that are being effected at this time by those healing mediums, each one of which has something different from all others in their modes of treatment." But alas, "Of these facts the doctors of the regular schools of medicine have evidently become fully aware by the lessening of their practice, and for some five or six years for that reason they have been besieging almost every State legislature in the Union to have laws passed making the painless and economical method of healing prescribed by Jesus punishable by fine and imprisonment."

With or without legislation these wonderful "Christ appointed," seed corn extracting healers are no more, though no one regrets their exit from the scene, but the dreadful diplomatic doctors still hold the field, and they "dominate" (as they have always dominated (the law of the survival of the fittest is immutable) "the warring nations even to the extent of excluding other healing methods" from their armies, so asserts the press agent concerning the reincarnation of spiritual healers, Christian scientists, and these same dense doctors are still so materialistic as to believe that the soldier "of God's making" can be wounded.

The medical profession is free to confess that it has often done much to influence legislation against irresponsible healers. It even confesses that it has not always cured its own patients, nor blamed their lack of faith as the cause of failure. It is indeed fallible, but survives and improves from age to age.

MILITARY MEDICAL ADMINISTRATION.

When the United States entered the war we had 490 medical officers in the Regular Army and about 1,200 in the National Guard. About ninety per cent. of the former and not more than ten per cent. of the latter had a comprehensive knowledge of medical military administration. This means that at the outbreak of the war there were in the service probably not more than 660 military officers who were proficient in the details of military administration. We now have in active service in the army approximately 20,000 medical officers, which means that more than 19,000 of these officers having been taken from civil life, have been compelled to learn the details of medical military administration since the war began.

This problem has been made a serious one by the fact that the laws, rules, and regulations under which military administration is carried on are scattered through various manuals, circulars, and digests. In collating all these various laws, rules, and regulations which bear upon the Detail of Medical Military Administration, Colonel Joseph H. Ford, of the Medical Corps of the United States Army, has done great service both to the medical officers and to the army. The volume which is published by Blakiston contains not only the numerous official regulations which are so bewildering to the civilian going into the army, but contains a large amount of interesting and helpful information regarding the customs of the service and the personal conduct of the officers which will be of inestimable value to the civilian physician in aiding him to conform to those unwritten but none the less binding social and military customs which obtain in army life.

The reserve medical officer who has this book before him will be saved many embarrassing moments and even saved much money in adjusting himself to military life. The range of topics covered is wide, and every officer joining should have a copy of the volume and should study it assiduously. Indeed, the material contained in the book is so valuable and its mastery will so much enhance the usefulness of the medical reserve officer that the department would be well justified in issuing a copy to every surgeon and in requiring him to undergo periodical examinations on its contents.

News Items.

Annual Outing of the Yorkville Medical Society.—The second annual outing of this society will take place Sunday, June 9th. For full particulars address the corresponding secretary, Dr. Samuel Floersheim, 170 West Eighty-sixth Street, New York.

The Red Cross War Fund.—Nearly \$150,000,000 has been contributed by the people of the United States for the second war fund of the American Red Cross Society, over-subscribing the amount asked for by about \$50,000,000. New York city's contributions amounted to nearly \$35,000,000, exceeding its quota by about \$10,000,000. The foreign division collected four times its quota of \$300,000, the highest percentage.

Philadelphia Societies to Omit Outings This Year.—The Philadelphia Alumni Society and the Medical Department of the University of Pennsylvania will not hold its annual outing this year, as many of its members are in military service. The directors of the Physicians' Motor Club of Philadelphia have also decided to omit their annual club run and spring outing this year.

Hospital Heads Resign.—Three of the four heads of departments of the Cumberland Street Hospital, Brooklyn, not approving of the plans of Commissioner Coler for a reorganization of the staff and a change in the plan of organization, have tendered their resignations. They are Dr. Herbert C. Allen, chief of staff; Dr. J. Hubley Schall, chief surgeon, and Dr. E. Rodney Fiske, head of the medical department.

British Honors for American Doctors.—According to press dispatches, the British Military Cross has been awarded to Captain Thomas Edward Walker, Medical Corps, U. S. Army, and eleven lieutenants in that service, as follows: Linwood M. Gable, Arthur Irving Haskell, James B. Clinton, Samuel Adams, Gouverneur Boyer, Harold Foster, John Gregg, Albert I. L. Jones, Baldwin L. Keyes, Guy D. Tibbitts, and Harvey C. Updegrave.

Meetings of Medical Societies to Be Held in New York during the Coming Week.—Monday, June 3d, New York German Medical Society, Brooklyn Hospital Club; Tuesday, June 4th, New York Neurological Society; Wednesday, June 5th, Bronx Medical Association, Society of Alumni of Bellevue Hospital, Brooklyn Hospital Club; Thursday, June 6th, Brooklyn Surgical Society (semi-annual); Friday, June 7th, Alumni Association of Roosevelt Hospital.

Red Cross Appropriations for Armenia and Syria.—The war council of the American Red Cross has made provision for monthly contributions to the American Committee for Armenian and Syrian Relief, aggregating \$1,200,000, for the period ending July 1st. The sum of \$400,000 was appropriated in February to cover the months of February and March, and another \$400,000 has just been made available to meet the payments for April and May.

How to Obtain an Officer's Commission in the Medical Corps.—The Medical Section of the Council of National Defense has issued a very comprehensive questionnaire stating fully the rank, pay, and character of service of qualified men, and answering all questions which doctors seeking to enlist in the medical departments of the Army and Navy are likely to ask. The urgent need for volunteers in both the Army and the Navy is pointed out in this questionnaire, there being places now open for 5,000 men in the Army and 1,000 in the Navy. Copies of the questionnaire can be obtained from Dr. Franklin H. Martin, chairman of the General Medical Board of the Council of National Defense, Surgeon General's Office, Washington, D. C.

War Hospitals in the United States.—The base hospitals of the national army and national guard, general and base hospitals, regular army hospitals, embarkation hospitals, etc., in this country, have a present and prospective capacity of 91,645 beds, which will give ample accommodations for all cases that may be expected within the next few months. The disposition of these hospitals is as follows: The base hospitals of the national army have a bed capacity of 18,387, with an authorized increase of 14,808 beds; of the national guard 14,843, with an authorized increase of 8,880 beds; general hospitals 16,209, with an authorized increase of 1,981 beds; regular army hospitals 2,550; base hospitals 7,664, with an authorized increase of 1,452 beds; embarkation hospitals 3,306, with an authorized increase of 1,565 beds.

Civil Service Examination.—The Municipal Civil Service Commission announces an examination for a medical superintendent, grades four, seven and five, for which applications will be received until June 11th at 4 p. m. Candidates must be licensed to practice medicine in the State of New York and have had at least two years' experience in administrative work in hospitals or its equivalent. Vacancies occur from time to time in the Department of Public Charities at salaries ranging from \$2,400 to \$3,000 a year, with maintenance. There is at present a vacancy on the Board of Inebriety at Warwick, N. Y., at a salary of \$2,580 a year, with maintenance. For full particulars regarding this examination address the Municipal Civil Service Commission, Room 1400 Municipal Building, Manhattan.

New Red Cross Institute to Aid Blind Soldiers.—The war council of the American Red Cross Society has appropriated the sum of \$700,000 to be expended by the department of military relief in defraying all expenses incident to the establishment and maintenance of the Red Cross Institute for Rededucating the Blind Soldiers. The work of the institute will be carried out in close cooperation with the general plans of the Army and Navy for the rehabilitation of blind soldiers and sailors. Major James Bordley, of the United States Army, will be in charge, assisted by a supervisory committee appointed by the department of military relief of the Red Cross. The institute will be run in conjunction with General Hospital No. 7, in Baltimore, Md.

Casualties from Bombing of British Hospitals.—Announcement is made by British authorities that three hundred casualties were caused by the recent bombing by German aviators of British war hospitals in France. On Sunday, May 26th, the Germans attempted to destroy the American hospitals behind the lines in Picardy, but fortunately the shells fell at some distance from the buildings and no damage was done.

A Bureau of Venereal Diseases.—Among the laws enacted at the recent session of the legislature of the State of New York, which has been signed by the Governor, is one providing for the establishment of a Bureau of Venereal Diseases in the State Health Department in charge of chief at a salary of \$3,600 a year. Thirty thousand dollars have been appropriated for the use of the bureau. The legislature also enacted a law requiring the Board of Health or the health officer of a health district to have examined all persons suspected of having infectious venereal diseases. Those convicted of vagrancy or of frequenting disorderly houses must be reported to the health authorities for examination and, if found affected, must submit to the required course of treatment.

Personal.—Major Richard Slee, M. R. C., U. S. Army, has been ordered to take the place of Colonel E. E. Persons, Medical Corps, of the Army Ambulance Service, who has been ordered to other duty.

Major E. E. Holmberg, Medical Corps, U. S. Army, has been ordered to command the Army Hospital now being organized at Whipple Barracks, Ariz.

Colonel J. A. Hornsby, Medical Corps, U. S. Army, chief of the hospital division, Surgeon General's Office, has been made a member of the Advisory Board of the Inventions Section of the war department, recently created within the general staff, in order to secure prompt and thorough investigation of all new inventions submitted to the war department.

Dr. Alexis Carrel, of the Rockefeller Institute, has been promoted by the French Government to the rank of Commander of The Legion of Honor.

Major Charles H. Young, Medical Reserve Corps, National Army, has been ordered to active duty and will proceed to Ayer, Mass., and report in person, on or about June 1st, to the commanding general at Camp Devens, for temporary duty at the base hospital.

Surgeon Julius O. Cobb has been nominated for promotion to senior surgeon; and Drs. Emil H. Marek, Joseph W. Mountin, Ralph E. Parker, and Fayette B. Ross, for appointment as assistant surgeons, in the Public Health Service.

The Greenhut Building to Be a War Hospital.—It is reported that the Federal Government has taken over the Greenhut building at Sixth avenue, between Eighteenth and Nineteenth Streets, New York, and the "big store," with its twenty-three acres of floor space, is to be a military hospital. The work of clearing out the store fixtures to make room for hospital beds is already under way. It is said that there will be accommodations for over 3,000 patients. According to the present plans the building will be used as a clearing house for the wounded and sick soldiers who will be landed at Ellis Island and taken to this hospital as soon as they are able to be moved. Later the patients will be distributed to various institutions throughout the country when they are able to take the

Brigadier General Noble.—On May 20th the United States Senate confirmed the nomination of Colonel Robert E. Noble, of the medical corps, to be a brigadier general in the National Army. General Noble was born in Georgia in 1870, graduated from the Alabama Polytechnic In-

stitute at Columbus, Ga., in 1892, and from the Columbia University with a degree of doctor of medicine in 1899. He entered the army as assistant surgeon in 1901, served three years in the Philippines and seven in the canal zone. He accompanied General Gorgas on an expedition to the Transvaal District in South Africa in 1903. He also served at Vera Cruz in 1914. He has been chief of the personnel division of the Surgeon General's Office since 1915 and has recently been made director of the division of hospitals. The nomination was made

Modern Treatment and Preventive Medicine

A Compendium of Therapeutics and Prophylaxis, Original and Adapted

RECENT OBSERVATIONS ON DIGITALIS THERAPY.

By LOUIS T. DE M. SAJOUS, B. S., M. D.,
Philadelphia.

(Continued from page 997.)

In the preceding issue various facts and recently expressed opinions were referred to, bearing on the question whether, in the production of clinical benefit by digitalis in cardiac cases, the slowing of the heart through vagus stimulation or the direct exciting action of the drug on the heart muscle is the more important factor. The evidence as regards small therapeutic doses seemed, on the whole, inconclusive, each side of the argument apparently receiving considerable support. Cushny, 1917, writing in particular on heart disturbances associated with auricular fibrillation, propounded specifically in relation to such cases the question whether, in addition to overcoming the prejudicial effects of the fibrillation on the ventricular contractions, digitalis may not also improve cardiac efficiency in part by increasing the strength of the beats—an action of the drug established as regards large doses through experiments on the lower animals. He did not, however, reach any definite conclusion, and pointed out that as yet no procedure for measuring precisely the contraction of the human heart has been discovered. That the movement of the heart is stronger under digitalis is clear, but the slowing of the rate, allowing of better recovery during the period of diastole, might be held to account for this. In the perfused animal heart, as Cushny remarked, the systolic increase under digitalis occurs at least as soon as lessened impulse conduction—a fact suggesting that, in patients likewise, improvement in the circulation under digitalis may depend in part on increased systole; the dose in such experiments, however, is decidedly greater than that clinically employed, and the analogy in this connection is thus not conclusive.

On the whole, while much stress has been laid off late on the vagal slowing by digitalis as a source of clinical benefit, and even a tendency been manifested to pass over the direct action of the drug on the heart muscle as a factor of less importance than has hitherto been believed, one should be loath to exclude positively the latter influence from participation in the therapeutic effects of small doses of digitalis without more definite evidence than is now available. Clinically, numerous observations attest to the fact that where vagal action is for some reason unable to assert itself, beneficial results are often inferior or even nil. Thus, H. H. Turnbull, 1912, states that in hearts in which the muscle is impaired from old age, insufficient blood supply, or chronic toxemia—cases in which slowing of the rate by digitalis is rarely seen—the therapeutic response is greatly reduced or absent. Again, W. E. Robertson, 1912, notes that where, in myocardial degeneration, no slowing of the rate nor lessening

of the tendency to abortive systoles occurs under digitalis, the drug, in the majority of instances, cannot be used, or, if used, is disappointing in its effects. Silberberg, 1912, on the other hand, refers to the fact that in childhood, in which—as in the aged—the inhibitory power and tone of the vagi are but slight and atropine has little effect in increasing the heart rate, digitalis, when therapeutically required, acts well, the heart muscle being young and generally in good condition. As well known, response of the diseased heart to digitalis varies to a considerable degree with the state of integrity of the myocardium, and this fact in itself suggests that the muscle is, to some extent, directly influenced by the drug. Again, as pointed out by Cushny, various drugs other than those of the digitalis group have the property of slowing the heart rate through stimulation of the vagal inhibitors, yet are of no benefit, on the basis of this property alone, in the conditions in which digitalis and its allies are of great value. Thus, aconitine is definitely known to slow the heart rate, by stimulating the vagus centre, but is entirely inappropriate and useless as a substitute for digitalis in cardiac insufficiency. No one claims for aconite under ordinary circumstances the power to increase the output of blood from the heart in a given interval of time, yet this is a well accredited property of digitalis even in small therapeutic doses. Some additional action on the part of the latter drug, and most appropriately a direct stimulating action on the heart muscle, is thus plainly suggested in accounting for the cardiotonic effect of small doses.

Finally, considering vagus stimulation from the standpoint of pure physiology, whether it be due to digitalis, a weak electrical stimulus applied to a vagus nerve, or any other exciting influence, such stimulation is not considered capable, under ordinary circumstances, of increasing the propulsive cardiac function. As Johansson and Tigerstedt observed many years ago, relatively weak stimulation of the vagi renders the ventricular contractions less frequent, though individually stronger. According to Starling, 1912, this is accounted for by the increased tension—owing to greater stretching—to which the muscle fibres are exposed during the prolonged period of diastole. The augmented strength of ventricular contraction, however, is not conceived of as causing an increased output of blood from the heart in a given period of time, the slowing of the rate preventing such an effect. Again, therefore, one is led to ascribe the increased output under digitalis, not to vagus action, but to a direct exciting action of the drug on the myocardium, occurring even with small doses. Hering and Gaskell have accredited to the vagi a favorable trophic influence on the heart, stimulation of these nerves being supposed to hasten the processes of anabolism, or building up of tissue, during cardiac rest; the accuracy of this view, however, has not been conclusively demonstrated.

Indeed, the trend of recent studies of digitalis has been, not toward a disproof of any one of the supposed actions of the drug on the heart, even in the case of small doses, but toward recognition of the fact that digitalis is a many sided remedy, which may bring about its beneficial effect in one of several different ways according to the clinical conditions existing in the subject. Just as digitalis, practically inactive as a diuretic in the normal individual, becomes somewhat more active where there is cardiac weakness without edema, and indirectly provokes abundant diuresis where edema coexists, so the effect of the drug on the heart varies with the nature of the disturbance of cardiac function in the individual case. In several respects the normal heart seems more refractory to digitalis action than various types of diseased heart. Recently reported studies of cardiac action by T. B. Barringer, Jr., relating to the reserve power of the heart in normal and abnormal individuals, with and without digitalis treatment, are suggestive in this connection. A summary of these studies and of other late observations illustrating clinical variations in the action of digitalis will be presented in the next issue.

(To be continued.)

Cardiac Insufficiency in Valvular Lesions.—J. S. Davis (*Virginia Medical Semi-Monthly*, February, 1918) urges that valvular cases with cardiac insufficiency be kept in bed for at least a week, no matter how well they may feel. If practicable the patient should lie low, though usually a back rest or chair is necessary. No visitors should be allowed, and the bedpan and urinal should invariably be employed. Edematous legs should not be elevated above the level of the waist, as gravity would thus transfer the fluid to a more embarrassing locality. The bowels should be opened once and then the movements kept soft with a mild vegetable laxative, efforts at defecation raising the blood pressure by fifty millimetres of mercury. A milk diet, not exceeding two quarts a day, is appropriate in even a mild case for half a week, and in the other grades for a longer time, though measured quantities of cereals and fruit juices with moderate amounts of water may usually be added in five or six days. Drugs to stimulate the heart, except in the most severe cases, may be delayed twenty-four hours to observe the effect of absolute rest. Whatever valve is affected, the digitalis group is to be preferred, the fat free tincture, infusion, and digipuratum being the best preparations, given by mouth every four to six hours. One should beware of intravenous injections in desperate cases that have been taking digitalis by mouth. Strophanthin is best for this purpose where the patient has not had digitalis before, but only one dose in two days should be given. Camphor in oil is sometimes useful. Caffeine is appropriate where the blood pressure is persistently low and diuresis poor. Theophylline with sodium acetate is also useful. Calomel, one half to one grain thrice daily, is an excellent diuretic and laxative, but salivates susceptible persons. A little alcohol or tobacco can be allowed to inveterate users. When the patient is able to lie flat, careful passive motions should be begun before he gets up. Special

baths and gymnastics are sometimes desirable in convalescents.

Gonorrhea Complicated by Syphilis.—N. P. L. Lumb (*British Medical Journal*, March 9, 1918) calls attention to the fact that when a patient presents with evidences of both syphilis and gonorrhea the practice is to devote special attention to the treatment of the syphilis and to prescribe little more than potassium permanganate irrigations for the gonorrhea. This is unsatisfactory, because in about ten per cent. of such cases the antisyphilitic treatment causes an aggravation of the gonorrheal infection and is specially likely to cause complications. Ten cases are reported, six having no evidence of gonorrhea on admission for syphilis, and four showing definite gonorrhea. In all of the cases the administration of antisyphilitic treatment produced gonorrheal complications. There were eight cases of epididymitis, four of prostatitis, and one each of cowperitis, arthritis, and hydrocele. The evidence seems to point to the use of mercury as the cause of the complications. To avoid these complications in cases with a past history of gonorrhea threads and gonococci should be sought in a centrifuged, eight hour sample of urine, taken twenty-four hours after the first mercurial injection; prostate and vesicles should be examined during the first week of treatment; if both of these examinations are negative a dose of gonococcus vaccine should be given and the first test repeated in twenty-four hours. If the latter is negative no treatment is required. If either test is positive for gonococci the urethra should be examined to locate the infection and proper treatment instituted. In cases with active gonorrhea the bladder should be irrigated with potassium permanganate in 1:8,000, rising to 1:4,000, solution, and vaccine given from the first.

The Abortive Treatment of Gonorrhea in the Male.—Frederic Bierhoff (*American Medicine*, March, 1918) points out that the following facts must be borne in mind: the case must not be one of first infection; it must be reasonably certain that a fresh infection exists; the interval between the infection and the beginning of treatment must not be long—preferably not over a week; the onset of the disease must not be of the virulent type; the gonococci must in greater part still be extracellular. If these facts are borne in mind, a large majority of the cases may be cured quickly and definitely. The method of treatment is as follows: the secretion is taken from within the urethra by means of a sterile platinum loop and at once examined under the microscope. The patient is then instructed to pass urine in two portions, of which the first contains all but a few drops, the rest being passed into a second glass. If the examination of the discharge and the inspection of the urine show the case one that offers the possibility of success, the anterior urethra only is irrigated by means of a large hand syringe with 450 c. c. of a one half per cent. solution of protargol. Care should be taken to avoid violence. The physician then shows the patient how to inject himself and orders him to do so every four hours with the small syringe of one half per cent. protargol solution containing in addition fifteen per cent. of glycerine. He is ordered to urinate before injection and to hold the solution for ten minutes in

the urethra. If the result is to be a positive one, at the end of twenty-four hours of treatment the urethral secretion will be found to be a mere trace and aseptic. The same treatment is carried out on the second day, and on the third day the patient presents himself in the morning without having injected himself. On the third day irrigation with 300 c. c. of a one quarter per cent. solution of protargol and three injections during the day. If the patient is free of gonococci on the fourth day, the irrigation is omitted and the patient injects himself twice only. On the fifth day the injections are also omitted and the patient proceeds to the alcohol test. This is repeated daily for a week. If still free of germs, coitis condomatus is permitted. If negative, the case may be considered aborted. If the gonococci have not entirely disappeared after forty-eight hours of treatment, the abortive treatment has failed.

Treatment of Eclampsia.—J. Clifton Edgar (*Journal A. M. A.*, April 27, 1918) states that, save in a small minority of cases, convulsive toxemia is always preventable. This is largely due to the fact that the symptoms of a pregnancy toxemia are so readily recognizable. Any adequate prenatal care of the mother should lead to their prompt discovery and the prevention of convulsive toxemia, and the major part of the treatment should therefore be preventive. But in those cases in which toxicemic convulsions do develop, through neglect or other causes, proper treatment is highly successful in saving both the maternal and the infant life. If absolutely essential to employ a volatile anesthetic for the control of the convulsions ether should be chosen and it should be used for as short a time as possible. At once, and preferably in place of the ether, a full dose of thirty milligrams (half grain) of morphine should be given by hypodermic; a catheterized sample of urine taken for examination; gastric lavage performed with a solution of sodium bicarbonate; and sixty grams (two ounces) of magnesium sulphate in solution, castor oil, or croton oil in sweet oil should be left in the stomach. Next, a colonic irrigation of four to five gallons of five per cent. glucose solution should be given and the patient placed in a darkened room and kept as quiet as possible. The morphine is to be repeated in smaller doses, according to indications, to keep the respirations in the neighborhood of ten to twelve per minute and in very nervous women a rectal dose of two to 2.6 grams (thirty to forty grains) of sodium bromide may be given to aid the morphine. Chloral hydrate should never be used as it increases the danger of damage to the liver, phlebotomy is very seldom necessary, and veratrum viride is highly dangerous and not to be used. Sweating by the electric light bed attachment is of value in aiding elimination but should not be pushed too far. The uterus should be emptied promptly for the beneficial results derived from the relief of intraabdominal pressure, but violent methods must be avoided as eclamptic patients are extremely poor surgical risks. The performance of a low forceps operation, the manual dilatation of a well softened cervix, the use of dilating bags, and occasionally abdominal Cesarean section in primiparas with firm cervixes are the measures of choice.

Septic Hemothorax and Empyema.—J. Campbell (*British Medical Journal*, January 26, 1918) obtains excellent results in the treatment of these conditions by removing any foreign body, if present; draining the pleural cavity in the usual manner by rib resection; cleaning out and exploring the pleural cavity; swabbing out blood clots; and breaking down adhesions. The cavity is then washed out with a warm mixture of hydrogen peroxide and eusol, or Dakin's solution. Then a rubber tube with a quarter inch inside diameter and a large lateral opening one quarter of an inch from one end is so inserted that its inner end lies in the lowest part of the chest cavity when the patient lies on the sound side. The wound is then sutured loosely. After recovery from the operation the size of the cavity is determined by carefully filling it with warmed Dakin's solution through the tube. Every four hours about one third of the amount of warmed solution required to fill it is run into the cavity and the patient made to retain it by lying for two hours on the sound side. The fluid is then syphoned off and the patient may assume any comfortable position. During the retention of the fluid the patient is urged to cough slightly, or to pant, at frequent intervals to splash the solution about thoroughly within his chest. The tube is removed, cleaned, sterilized, and replaced once daily. By this method the "suture standard" can be reached in the pleural cavity in a very short while and the cavity can be closed.

Intermittent Closure of Amputation Stump Wounds.—H. Chaput (*Bulletin de l'Académie de médecine*, February 5, 1918), in cases of amputation through diseased tissues, or in which infection of the stump has occurred, everts the flaps during the daytime and brings them together at night. The eversion consists in seizing the subcutaneous tissues with forceps, reversing the flaps toward the root of the limb, and fastening them to the mattress or bedposts with cords tied to the hemostats. The stump rests on aseptic compresses, and is exposed to the air, under a tent, throughout the day. For the night the flaps are brought down over the bone, filiform drains or sheet rubber placed under them, and the flaps maintained in good position by adhesive strips, some disclosed circularly and others vertically in U fashion. When the infection has been overcome, the flaps are no longer everted in the daytime; the adhesive strips are left on permanently, and continuous extension on the circular strips instituted. With this procedure, healing is usually complete in fifteen to twenty days. The stump is rapidly disinfected, and remains in excellent condition. No reamputation or bone shortening, which too often leads to reinfection, great delay, and further shortening, is necessary. The intermittent method is indicated in all severe stump infections, and whenever it has been impracticable, for lack of time or because of contusion or threatening gangrene of the tissues, to close the wound. It is likewise indicated in certain patients with constitutional or other deficiencies that favor prolonged suppuration in wounds. It can not be applied in circular amputation or where the flaps are very short; in such instances one should amputate again higher up, and practice intermittent closure where failure of immediate union is apprehended.

Operative Correction of Deformity in Gunshot Fractures.—James Taylor and A. G. McLeod (*Lancet*, March 16, 1918), deal with those cases seen after the fracture has apparently healed soundly. The first step is the improvement of the nutrition of the limb, for if there is mere reduction of the deformity the patient is but little benefited. Massage, hot air baths and electrical treatment are given to soften scars, remove induration and edema and mobilize the joints. This treatment also often causes lighting up of infection in healed wounds and serves as a valuable means of determining when it is safe to operate with respect of danger of re-starting infection. If deep massage for a few days causes no inflammation, the patient is given a series of graduated active exercises and if there is still no inflammation, operation may safely be undertaken. In the actual operation the important features are that no bone must be removed and that the deformity must not only be corrected, but the extremity restored to its full length. In transverse fractures the line of union is exposed, the new tissue cut away and the ends restored to the condition they were in immediately after the fracture. They are then brought together with the aid of strong bone forceps, angulation and straightening of the limb. In spiral fractures, after preliminary operative preparation, the fragments are brought together and crushed so as to remain together. These methods have proved most satisfactory in the type of cases described.

Transplantation of Bone.—W. E. Gallie and D. E. Robertson (*Journal A. M. A.*, April 20, 1918) present an extensive discussion of the results of their animal investigations and clinical experiences in bone transplantation, in which they emphasize the principles which are necessary for success. Living, autogenous grafts are alive only in respect of the osteoblasts which are free on their surfaces and in the mouths of the Haversian canals, the entire remainder of the graft dying and undergoing absorption. Their value in bridging gaps and promoting bony union rests upon the fact that during the absorption the osteoblasts which invade them from their surfaces and from the neighboring bones build up new bone in their place. It is absolutely essential to secure perfect contact between the graft and the fresh, healthy bone of the fragments and the graft should be extended well beyond the sclerosed extremities of the fragments. The graft should have its periosteal and endosteal surfaces intact because the greater number of osteoblasts are found on these surfaces. For the same reason the graft should be made of soft, porous, cancellous bone in so far as the needs of strength will permit. The graft made of a split rib is almost ideal in this respect, the splitting giving better access to the lymph which nourishes the osteoblasts. When the main graft is placed, as many small fragments of bone should be packed in about it as possible to increase the surface area for the growth of osteoblasts. Where the introduction of living bone is not necessary the use of boiled bone for plates and screws should be preferred to metal as this material has many of the virtues of living bone and is ultimately completely absorbed leaving no foreign body which may later cause trouble.

New Joint Formation in Arthroplasty.—D. B. Phemister and Robert M. Allen (*Annals of Surgery, Gynecology, and Obstetrics*, April, 1918) state that the changes which followed resection of the articular surfaces and construction of a new joint by the three methods employed are: in the no-flap operations, a joint cavity forms which was diminished in size because of more or less obliteration of the recesses about the sides from thickening and ossification of the capsule and adhesions of the synovia. Excised portions of the capsule and synovia were rapidly but atypically restored, villous synovial was frequently present even in the oldest experiments. Articular surfaces formed on the ends of the bones as follows: Over the prominent portions which contact with and are pressed upon by the opposing bone, a dense bare bony surface formed, which, as a result of motion soon became smooth and shiny; over the sides, grooves, and depressed portions which were subjected to little or no pressure, a fibrous covering formed by outgrowth from the open cancellous spaces along the surface. With increasing age the fibrous covering usually tended to spread over the entire bony surface, gradually absorbing and replacing the dense bare bony areas. The change was slow and in some of the oldest and best functioning joints large bony surfaces were present, the process seeming to be at a standstill. The range of motion varied from fifty degrees to almost normal and generally was greater in the elbow than in the knee joint and in the pedunculated flap operations. The flap early underwent pressure necrosis and disappeared except about the margins and along the grooves where it was not pressed upon. As motion was re-established, more of the remaining portions were destroyed until eventually little of the flap was left. Only a small part of its base received its nutrition through the pedicle. Any other portions which survived became attached to the ends of the bones and participated in the formation of a fibrous articular covering for the region. The changes in the articular surfaces of the ends of the bones were practically identical with those occurring in the no-flap operations. In the regions subjected to pressure, a dense polished articular surface formed, while in those subjected to little or no pressure, a fibrous covering formed, partly by outgrowth from the underlying bony surface and partly from surviving remnants of the flap. The size and appearance of the reformed joint cavity and the range of motion were about the same as in the no-flap experiments. In the free flap operations the flaps broke down and disappeared in the same manner and to about the same extent as in the pedunculated flap operations. The changes in the articular surfaces of the bones and the character and mobility of the reconstructed joint were the same as in the other two sets of experiments. Infection, prolonged immobilization, displacement, and too extensive and imperfect resection unfavorably influenced all three groups of experiments to about the same degree. Hence it mattered little in experiments on the normal knee and elbow joints of dogs, whether arthroplasty was performed by the no-flap, pedunculated flap, or free flap method. The flaps, when used very largely, broke down, and the newly formed joint was about the same, both structurally and functionally.

It would be unwise to draw too definite conclusions as to the similarity of changes and functional results obtained from operations on these and on human joints ankylosed as a result of disease. While there were many points of resemblance, as the bare bony articular surfaces and the relations of the flap when one was interposed, there are also many differences. The muscles, tendons, and remaining portions of the capsule were normal in the dog. In the human, as a result of disease and prolonged disuse, the muscles became atrophied, the tendons adherent, and the capsule thickened so that it was impossible to obtain early active motion as in the dog. On the other hand, this disadvantage was considerably offset by the intelligent co-operation of the patient permitting the early use of massage and active and passive motion. However, it seemed probable that in the operation for mobilization of ankylosed joints, the result would be the same whether or not a flap is interposed. Certainly the most important steps were the construction of a well fitting new joint, the excision of any thickened or obstructing fibrous tissue, and proper after treatment for the maintenance of mobility.

Treatment of Human Trypanosomiasis.—W. E. Masters (*Journal of Tropical Medicine and Hygiene*, February 1, 1918) presents a report based on 370 cases and 6,200 therapeutic drug injections. He found that in the first or fever stage of the disease, the best results are obtained with a combined oral, intramuscular, and intravenous drug treatment. Orally the following combination is used:

R Antimonii et potassii tartratis,	gr. $\frac{1}{2}$;
Caffeinae,	gr. ii;
Acidi tartarici,	gr. v;
Tincturae opii,	
Tincturae nucis vomicae,	ana mv ;
Aqua chloroformi,	q. s. ad fl. ss .

M. Sig.: One ounce three times daily in plenty of water, the dosage being increased if possible.

Intramuscularly, soamin, 0.25 to 0.77 gram, is given every five days. Intravenously, a two per cent. solution of tartar emetic is used in doses of four to twelve mils, increased from the lower to the higher amount by one mil at each injection until toxic symptoms arise. The dose is then reduced by one mil and maintained at this level. The injections are given on alternate days. One week's rest is given after five weeks' treatment. With these measures, in 216 cases, the author obtained recovery—with no trypanosomes found on repeated blood examination, in 3.9 per cent. of instances; improvement, but with trypanosomes still found, in 27.9 per cent.; no improvement, in 19.4 per cent.; ultimate death, in 37.3 per cent., and cases still under treatment, 11.7 per cent. The need is expressed for a less toxic form of antimony, e. g., a stable form of colloidal antimony, with which the results could probably be further improved. When cases in the sleeping sickness stage of the disease do not soon respond to treatment they should be isolated and removed to an asylum. Treatment in this last stage often causes sudden death. General prophylaxis by sanitation is believed by Masters to be the only feasible plan for eradicating the disease.

Cancer of the Rectum.—Jerome M. Lynch (*Annals of Surgery*, April, 1918) concludes as to the operative treatment of cancer as follows: He would urge that digital and proctoscopic examinations be made as a routine in all patients presenting gastric and intestinal symptoms, as early diagnosis often meant saving the patient. All cancer cases should be referred to a surgeon. If inoperable, colostomy should be performed as soon as possible, thereby saving much suffering and discomfort. No patient should be denied a radical operation until it was proved beyond doubt that it was not justifiable.

Tuberculosis of Elbow Joint.—Michael Casper (*American Journal of Surgery*, February, 1918) quotes Porter with regard to the treatment of tuberculous joints, saying that there are three distinct indications. To increase resistance; place the joint in the best possible position for future usefulness, and to prevent deformity. Casper goes on to say that under mechanical treatment immobilization is given the chief place, and the fact is emphasized that immobilization must be complete. Plaster of Paris is efficient in the early stages. Bier's obstructive hyperemia is mentioned as a probable aid when thoroughly and efficiently used surgical treatment for joint fixation in adults is advised; otherwise surgery should be avoided as far as possible. Antiseptic injections are considered by the author as practically useless. Similar views are expressed by Ely and many other observers.

Extraction of Foreign Body from Brain.—H. H. Rayner and A. E. Barclay (*British Medical Journal*, February 23, 1918) report a case of successful removal of a long retained foreign body in the brain, and describe an improved extractor for such a purpose. The main part of the instrument is made like a pair of dental forceps, the jaws of which remain about one and a half inches apart when closed. Above and parallel to these is a small fluorescent screen, while attached to them at right angles are two narrow beaks or blades which meet at their points. One of the blades is slightly longer than the other, and into it is let a small fibre insulating block. The point of the longer blade is rounded for brain work. The blades are connected with an electric bell through a specially fitted relay to prevent stimulation of the structures. When the two blades are brought into contact with the foreign body the bell rings. Then if the blades are raised slightly, opened and pushed back again, the foreign body will be grasped between them without the inclusion of any tissues. In use the patient is protected from the x rays by a sheet of heavy ray proof rubber having a three inch hole in it, the body is localized exactly on the screen so that it lies between the shadow of the tips of the blades, and the insertion of the blades is begun exactly over the shadow of the body, and continued in the direct line of the rays. A stronger instrument is useful for the extraction of bodies from tissues other than the brain. The instrument is useful only in cases in which direct access to the foreign body can be had through soft structures and where the foreign body is not surrounded by old and dense fibrous tissue.

Miscellany from Home and Foreign Journals

Nervous Form of Endocarditis Lenta.—Henri Claude (*Bulletin de l'Académie de médecine*, March 12, 1918) reports the case of a young man of eighteen suffering from marked anemia, lassitude, and a temperature ranging between 38° and 39° C., with a slight systolic murmur at the apex. Six months before he had developed severe chorea, which had lasted over two months, then gradually lessened, while leaving him in a weakened general condition. Two weeks after admission in the hospital, he had pain in the left hypochondrium, the spleen became palpable, and a rise in temperature to 39.8° took place, with rigidity of the neck and spinal column. Next day the meningeal signs grew more marked and an attack of rightsided hemiplegia occurred, with increasing alternate paralysis of the facial nerve on the right and the trigeminal on the left. The patient remained semicomatose for about three weeks, then seemed distinctly better for a few days. At this time repeated lumbar punctures showed increase of albumin in the spinal fluid, with polynucleosis and later lymphocytosis. High fever set in, soon terminating in complete cachexia and death. Postmortem, the mitral valve and left auricular wall showed abundant vegetations containing grampositive streptococci. The nerve centres showed a slight meningocortical reaction, and in particular a small focus of softening in the left pontocrural region, adjoining an arteritis of the basilar trunk. Sections of this and other arteries revealed local ectasias of the arterial walls due to infectious arteritis. Multiple infarcts in the spleen were also found. The chorea and meningeal symptoms in this case are alike ascribed to the special streptococcal infection which had given rise to the heart lesions. Along with the frequent embolic complications of endocarditis lenta, a definite rôle in the production of complications should be recognized for infectious arteritis with local ectasias, as illustrated in the present case.

Survival of Poliomyelitic Virus in Brain of Rabbit.—Harold L. Amoss, (*Journal of Experimental Medicine*, March, 1918), in a study of the relation of the filterable virus of poliomyelitis to the rabbit, with the idea of bringing out resemblances to or distinctions from, the streptococcus, and of determining its power of survival in the brain *in vivo*, found that suspensions of the central nervous tissues of monkeys containing the active filterable virus of poliomyelitis might be injected into rabbits' brains without producing symptoms, if the volume of injection be not sufficient to cause increased intracranial pressure. This was the only symptom produced by the suspensions. Suspensions of the rabbit brain tissue from the original site of injection were then reinoculated in monkeys, and by this test the active virus of poliomyelitis survived in the brain of rabbits for four days, but after seven days, it could not be demonstrated by this test. The virus of poliomyelitis is not adapted to the rabbit; it neither produces lesions nor survives long in its central nervous organs, in this way differing from some streptococci cultivated from

poliomyelitic tissues. A monkey was immunized against a streptococcus cultivated from human poliomyelitic nervous tissues and was tested for neutralizing action on the filtered poliomyelitic virus and for protection against an intracerebral inoculation of the same virus. The serum of this monkey agglutinated the strain of streptococcus in a dilution of 1:4,000. It was without neutralizing action on the filtered virus; it also was not protected against the effects of an intracerebral inoculation of the filtered virus. Amoss concludes that this work furnishes additional reasons for believing that the streptococcus cultivated from cases of poliomyelitis differs essentially from the filterable virus, and is not the microbic cause of epidemic poliomyelitis.

Method for Estimating Total Blood Volume in Anemias.—Edward Lindeman (*Journal A. M. A.*, April 27, 1918) reviews the methods of estimating total blood volume so far employed and points out their disadvantages and shortcomings. His new method consists in securing specimens of blood from both patient and donor just before transfusion by the syringe-cannula method, in which no foreign material is added to the blood; taking a third specimen from the recipient three minutes after the completion of transfusion; and accurately measuring the amount of blood transfused. Each blood specimen is collected in a calibrated centrifuge tube containing 0.2 mil of saturated solution of potassium oxalate. Each tube of about six mils of blood is shaken slightly for mixture of the oxalate, corked to prevent evaporation, centrifuged for twenty minutes at 3,000 revolutions per minute, and the volume percentage of combined red and white cells is then determined. The total original blood volume of the recipient is then calculated according to the following formula, in which x is the initial volume; a the red blood count volume per cent. of the initial volume; b the volume of new blood given; c the red blood count volume per cent. of the blood given; and v the final volume per cent. of red blood cells. Omitting the steps of

calculation, the final formula is $x = \frac{a-b}{a-f}$. The

method is applicable in cases requiring transfusion and is practically free from the error of the personal equation. Its application is illustrated in a case of severe secondary anemia in a woman weighing 130 pounds. Before transfusion her cell volume was 13.7 per cent., after transfusion it was 25.5 per cent., the amount transfused was 1,500 mils, the cell volume in the transfused blood was forty per cent., and a total of seventy mils of blood were withdrawn from the patient for tests before transfusion. The

recipient's blood volume was $\frac{13.7 \times 1,500}{25.5 - 13.7} = 1843$ mils, to which the seventy mils withdrawn was added, making a total of 1,913 mils. This patient had a blood volume of only forty per cent. of that which she should have had and a richness of only twenty-five per cent. of normal.

Rapid Macroscopic Agglutination Test for Blood Groups.—Beth Vincent (*Journal A. M. A.*, April 27, 1918) suggests the following simple and rapid macroscopic method for the application of Moss's test: Using citrated Serum II and Serum III, made to contain 1.5 per cent. of sodium citrate to prevent coagulation of the blood to be added, and preserved with 0.25 per cent. tricresol, a glass slide is prepared by placing one or two drops of Serum II on its left end and an equal amount of III on the right end, then two small drops of the blood to be tested are secured from a finger prick and mixed with the two serums. A positive agglutination is shown by clumping of the red cells which occurs within less than a minute and which is easily seen by the naked eye. The group number of the corpuscles is readily determined from the resulting combination of reactions in these two tests by comparing the slide with the two middle columns of the accompanying table.

RELATION OF THE FOUR BLOOD GROUPS.
Corpuscles

Group:	Serum			
	I	II	III	IV
I	o	+	+	+
II	o	+	+	+
III	o	+	+	+
IV	o	o	o	o
	I	II	III	IV

The Healing of Superficial Wounds.—A. Lumbrière (*Bulletin de l'Académie de médecine*, March 12, 1918) took tracings of the margins of experimental wounds in dogs and of war wounds in man at regular intervals, and sought to deduce therefrom definite rules governing the healing of wounds of the skin and subjacent tissues. Regular healing took place only where all adhesion of dressings to wounds was avoided; this end is easily attained by placing immediately over the wound a single layer of tulle of two millimetre mesh, impregnated with sterile vaseline. A study of serial tracings from several hundred wounds treated antiseptically with ether containing iodoform, phenol, and geraniol showed that the mean daily diminution of the open area is very variable, and is the more pronounced the larger the wound. Mean daily diminution of the circumference and length of a wound is not uniform, depending chiefly on the shape of the open surface, but the diminution in breadth of the wound is nearly constant, and constitutes alone the proper criterion for judging of the rate of healing of a wound. The absolute rate of healing of a wound is constant, i. e., repair goes on as quickly toward the close of healing as at the start. The time required for healing is proportionate with the maximum width of the wound. Daily, nonadhering, antiseptic dressings in young adults result in diminution of the breadth of wounds by about one millimetre a day. If the dressings are renewed but once a week, healing is much slower, and bacterial pullulation frequently sets in in spite of all precautions. Simple washing of wounds with normal saline solution, i. e., aseptic treatment, results in more rapid progress than occurs with the antiseptic ether solution, the daily rate of healing being raised to 1.2 or 1.3 millimetres. At times, however, healing under such treatment is suddenly checked by bacterial contamination. The best plan of all was found to be the use of antiseptic dress-

ings of starch iodide, healing being so accelerated by this agent that the rate of width reduction exceeded 1.6 millimetres a day.

Progressive Muscular Dystrophy.—Francis H. McCrudden (*Journal, A. M. A.*, April 27, 1918) points out that there is a low blood sugar in progressive muscular dystrophy and that treatment which raises the blood sugar improves the muscular strength. Blood sugar is the source of muscular energy; muscular activity rapidly consumes the blood sugar which is promptly replenished from the glycogen stored in the liver. Failure of replenishment leads to muscular weakness, irrespective of the cause, as seen in Addison's disease and poisoning by diphtheria toxin, phosphorus, etc. Hypoglycemia, therefore, adequately explains the weakness in progressive muscular dystrophy and hypoglycemia results only from failure of the supply to keep pace with the demand. Excessive sugar utilization or loss through the kidneys can be ruled out in progressive muscular dystrophy. There must therefore be a diminished rate of glycogen formation. The carbohydrate ingested is not converted into glycogen but remains in the blood for a long time and is then probably changed into fat, as shown by the marked fatty degenerations, the lipemia and the increased respiratory quotient. This impaired glycogenesis can be shown not to be due to damage to the liver, and the administration of epinephrine gives rise to a prompt increase in the blood sugar and points to a disturbance in the function of the adrenals or other endocrine glands.

Diabetes: Results of Treatment; Future Problems.—Elliott P. Joslin (*Bulletin of the Johns Hopkins Hospital*, April, 1918), in a very interesting paper discusses the subject with much hopefulness, warranted by the results obtained in the last four years through the adaptation of Doctor Allen's treatment. Such figures as a drop in mortality from twenty-seven per cent. for the ninety years from 1824 to 1914, to six per cent. in 1917, is at least a cause for satisfaction. In threatened diabetic coma the rules of the New England Deaconess and Corey Hill Hospitals are quoted, which embrace a special nurse for the patient, keeping him warm, regulation of the bowels, freeing the stomach of indigestible food by gastric lavage, if necessary; maintenance of the circulation with digitalis, etc., the administration of 1,000 c. c. of liquid within each six hours, strict attention to diet, of course, and the avoidance of alkalies. An outline of the familiar fasting treatment is given. The problems which stand out most urgently are narrowed down to five, the first of which is to determine whether the tolerance of a mild diabetic for carbohydrate is lowered by the present method of making him sugar free; secondly, whether the tolerance of the diabetics can be raised; thirdly, the increased lipid content of the blood and the measures necessary to reduce it; fourth, the high blood sugar, and whether attempts should be made to reduce it, and last, the fact that edema and anasarca in severe diabetes is accompanied by well-being on the patient's part, so that the suggestion of producing these conditions is tentatively offered when the patient is threatened with coma.

Motor Jacksonian Epilepsy Among Men Wounded in the Rolandic Region.—H. Meige and Athanassio-Bénisty (*Presse médicale*, March 4, 1918) class as related to typical Jacksonian epilepsy, which, while at times purely motor, is generally both sensory and motor, certain motor manifestations very probably of epileptic nature. In a first group of cases these motor disturbances appear in the intervals between typical Jacksonian seizures, and consist of slow or sudden movements of pronation or supination of the hand, flexion of one or more fingers, etc., or paroxysms of trembling in a limb or the entire half of the body, preceding the epileptic seizures by a few days, or occurring after fatiguing exertion or some emotional strain. A second group exhibit certain continuous movements, either as equivalents of true epilepsy or in subjects wounded in the head but free of typical epilepsy. These manifestations comprise a rapidly executed tremor occurring especially in the distal portion of an extremity and made worse by fatigue and exertion; movements of one or more of the fingers which form the starting point of the Jacksonian attacks, sometimes simulating, at a slower rate, the tremor of paralysis agitans, and finally, choreiform movements. A third group includes those the authors have previously described under the term Jacksonian paresis, exhibiting a sudden and transitory paresis, either of a single extremity or, more frequently, of both the lower or the upper limbs. The sudden paresis is nearly always accompanied by loss of warmth in the involved extremities, which may become purplish or asphyxial in appearance. This last disturbance would seem to be of a vasomotor nature.

Chronic Lumbar Rheumatism.—A. Léri (*Presse médicale*, February 28, 1918) describes a condition commonly met with among soldiers and presenting a clinical picture in many respects different from the rarer, previously recognized state known as chronic vertebral rheumatism. The chief complaint of these patients is of lumbago or sciatica, generally unilateral. The pain is sharp and may be either continuous or paroxysmal. Nearly always the patient is unable to stand up straight, the body being bent forward and the knees more or less flexed. The trunk may also incline to one side—toward the painful side, if sciatic pains are present. When the patient stands the lumbar region may impart a slightly doughy feeling to a palpating hand. The normal lumbar lordosis is absent, and sometimes even it is replaced by kyphosis, with prominence of two, three, or four of the lumbar spinous processes. The patient cannot bend the body down and forward nearly as far as a normal subject, and when he attempts to do so the lumbar spinous processes project strikingly. A pathognomonic feature of the condition is a combination of the lumbar kyphosis with a dorsal kyphosis and an intervening lordosis, a wave like alignment of the spinous processes being thus produced. The sacrolumbar muscle masses show little or no thickening or contracture in these patients. A marked feature of the condition is that, whereas active mobility of the spinal column is limited, passive mobility is preserved, the patient being able to stretch out completely when in bed. In the standing position lateral mobility of the spine

in the lumbar region is never wholly lost as it would be in Pott's disease. X ray studies showed almost constantly a marked broadening of the upper and lower portions of the vertebrae, which are, moreover, somewhat packed together and relatively transparent, suggesting decalcification. In the most seriously affected vertebrae beaklike prolongations from the upper and lower portions of these bones were noted, these prolongations doubtless finally uniting and immobilizing adjacent vertebrae. All the processes of the vertebrae were found to be thickened. The disease is held by the author to constitute a localized form of chronic vertebral rheumatism.

End Results of Friedmann's Vaccine.—Harry Lee Barnes (*Journal A. M. A.*, March 30, 1918) gives a tabular analysis of the end results of the use of Friedmann's vaccine in 120 cases treated in 1913 and compares this with a similar analysis of 287 patients under ordinary sanitarium treatment. The results of the comparative analyses prove conclusively that the vaccine was of no therapeutic value whatever.

Herpes Zoster and Chickenpox.—Benjamin Goldberg and Francis D. Francis (*Journal A. M. A.*, April 13, 1918) report three cases of chickenpox in adults, each of which was preceded and accompanied by typical herpes zoster. Five similar cases of a combination of these diseases have been reported in the literature, and there are two reports of cases of herpes zoster having been the only apparent cause of epidemics of chickenpox in exposed persons. Herpes zoster seems to have been fairly well established as being due to streptococci, but the cause of chickenpox remains unknown.

Manic Depressive Psychosis in the Negro.—E. M. Green (*Journal of Mental Science*, April 1918) regrets the extreme paucity of literature on mental disorder in the negro. This race can be best observed in the South where they live in large numbers under fairly normal conditions. Green states that he has the manic depressive type of reaction more frequently than does the white, being by nature happy, active and emotionally unstable. Statistics culled from state hospitals are misleading, for some use the Kraepelinian scheme while others do not; in the present paper the results are based on 2,877 negroes of whom 501 were manic depressive. The mortality is higher than in the same disease among whites.

Action of Antiseptics on Toxin of Bacillus Welchii.—Herbert D. Taylor and J. Harold Austin (*Journal of Experimental Medicine*, March, 1918) were able to protect pigeons against multiple fatal doses of the toxin of *B. welchii* by giving them a mixture of toxin and Dakin's hypochlorite and chloramine-T solutions. The toxin and antiseptic were mixed *in vitro* and allowed to stand in contact for five minutes before injection. The detoxicating action of the solutions was also shown when the toxin was treated with serum before the addition of the antiseptic, which is of clinical interest, as the conditions more closely approximate those met when the antiseptic is applied to wounds. Phenol solution in a concentration of 0.25 per cent. exhibited no such action.

Proceedings of National and Local Societies

ASSOCIATION OF AMERICAN PHYSICIANS.

Thirty-third Annual Meeting, Held in Atlantic City, N. J., May 7 and 8, 1918.

The President, Dr. F. H. WILLIAMS, of Boston, in the Chair.

Instructions in Treatment.—Dr. F. H. WILLIAMS, of Boston, in his presidential address, dealt with the instruction of students on points in therapy and pharmacology, known to the older practitioner, but outside of the student's experience. The young practitioner had many difficulties in adapting the details of pharmacology and therapeutics to practice. Students should be taught by men with long clinical practice, and, in that way, they would learn to bridge the gap between *materia medica* and therapeutics on the one hand and the practice of medicine on the other. In the field of surgery the young surgeon was allowed to watch and to assist at operations, he learned the practical application of splints and other technical details, and the same line should be followed in medicine. The proof of the necessity of this method of teaching was seen when students were asked to prepare papers outlining treatment. The papers fell into three groups: (1) good; (2) incomplete; (3) with serious mistakes. The student and the young practitioner should learn how many resources medicine had at command, the lack of knowledge of which was sometimes very culpable. The man who could bring sleep to the patient without resorting to hypnotics, or alleviate pain without prescribing morphine, in other words accomplishing results by simple means, was learning to be a past master in his art.

Results from the Intravenous Use of Salvarsan in Syphilis of the Nervous System.—Dr. BERNARD SACHS, of New York, read a paper on this subject. He said that at this critical period of the national life it was important to consider the treatment of a disease which so often maims and so rarely kills. The paper was based on results of analyses of 400 cases at Mt. Sinai Hospital treated intravenously with the Philadelphia preparation of arsenophenamin, which had proved entirely satisfactory. The views of Doctor Sachs upon the superiority of the intravenous method had been opposed by Doctor Fordyce, who had stated that . . . "if the views of Doctor Sachs are final, an enormous amount of harm will result, as many victims of syphilis of the central nervous system will be deprived of their hope of recovery." Doctor Sachs said he felt convinced that much more good would be accomplished by the intravenous treatment, which could be said to be safe in the hands of the majority of physicians. All biological tests should be used as corroborative evidence, and clinical evidence should not be disregarded. It could be said that the lack of serological evidence did not always disprove syphilis, nor was there a parallel between clinical symptoms and serological findings, as remissions were often observed without sero-

logical change, and serological improvement was not always accompanied by clinical betterment. It was only in types with vascular lesions that the clinical findings and serological tests progressed *para passu*. Of general paresis and tabes it could be said that the chief lesions were deep in the brain and cord, far removed from the spinal fluid, and only to be reached by the blood stream. In the meningomyelitic type of involvement it was impossible for the curative substances to remain in the fluid long enough to do any good. The doctrine of the impermeability of the choroid plexus was refuted. The pressure in the cerebral capillaries being higher than in the fluid, a metallic substance like salvarsan was rapidly absorbed into the venous system; therefore, why should not the venous system be used at once? Intraspinal medication, it was stated, was theoretically and essentially unsound. It was fatal to the syphilitic organism, but frequently also to the patient. Early and intensive treatment was necessary, as many doses as one every other day for four to six weeks, followed by a period of complete rest, were necessary. Forty or fifty injections might be required within a year. It would be impossible to introduce toxic substances so frequently into the canal. The advantages of the intravenous method were shown in the improvement of such syphilitic symptoms as headaches, palsies, epilepsies, and vascular symptoms. The type of case with spastic rigidity, rather than paralysis, showed least improvement from beginning to end. No claim could be made for the cure of tabes dorsalis or general paresis by the intraspinal method, the most that could be said was that remissions might be longer. It had been claimed that the neurologist did not see early cases, but it was precisely the neurologist or the psychiatrist who made the early diagnosis. It was therefore urged that treatment be begun as early as possible, and continued for years, and the patient be kept under medical control as long as necessary.

Dr. S. MELTZER, of New York, said that there were a few points he would like to bring out. There was no exact knowledge as to degrees of permeability. Benedict had found salvarsan in the spinal fluid, but no doubt not in such quantities as if injected intraspinaly. Doctor Swift in his work had used not merely salvarsan, but salvarsanized serum, which was a different thing. Was there any objection to giving intraspinal treatment at the same time, provided it did no harm. If Doctor Sachs could not state positively that he had seen harm result in any particular case, there could be no objection to the use of both methods combined.

Dr. WILLIAM H. PARK, of New York, said that in regard to tetanus antitoxin, one could absolutely show that the intraspinal injection would protect and cure, while the intravenous alone would not. The two were given simultaneously.

Dr. Bernard Sachs said in reply to Doctor Meltzer's question as to why he did not advocate the combination of the intraspinal and the intra-

venous methods—he had distinct experience of the far more dangerous character of the intraspinal medication. In innumerable cases the intraspinal injection had accomplished nothing, but had caused great misery to the victim. He had seen immediate paralyses ensue and cases where rectal and vesical control had become markedly impaired. As important biological changes could be wrought by the intravenous method as by the intraspinal. The safety of the public at large demanded that this manner of medication be used to the utmost, and the intraspinal left to those who had a special fondness for it.

The Relation of the Chemical Structure of Opium Alkaloids to Their Action on Smooth Muscle and on the Pharmacological and Therapeutic Properties of Some Benzyl Esters.—This paper was read by Dr. D. I. MACHT, of Baltimore. For four or five years he had made an intensive study of the alkaloids of opium in connection with morphine. A marked difference was found in the alkaloids of the two products. There was a difference in the effect upon the respiratory and the vomiting centres. The alkaloids of opium acted upon the central nervous system, upon peripheral structures, and upon smooth muscle. The effects upon the ureter by both the morphine group and the papaverin group (opium) were studied. The effect by morphine was increased tonicity, that of papaverin was relaxed tonicity and inhibition of contractions. Thus the latter preparations (papaverin alkaloids) could be used for expulsion of renal calculi by relaxation of the ureteral muscle. Search was made for nontoxic products and benzyl benzoate and benzyl acetate, only slightly toxic products were found, giving the effects of papaverin. Metabolic studies showed that benzyl acetate was excreted by the kidneys as hippuric acid. This was nontoxic and could be administered by mouth. It had been tried clinically, but the disagreeable odor and digestive disturbance after its use would contraindicate its use. Benzyl benzoate was then tried. It was found to be of use in cases of excessive peristalsis, and in diarrhoea and dysentery remarkable results had been obtained. A twenty per cent. solution in alcohol was used. Other indications were in pylorospasm, intestinal colic, spastic constipation, biliary colic, ureteral calculi, vesical spasm, spasm of seminal vesicles, uterine colic, arterial spasm, high blood pressure, and lastly, bronchial spasm with true asthma, in which remarkable relief was afforded. Benefit was caused by relaxation of spasm. This remedy was now available for the profession, and it was hoped that other cases would be reported.

The Use of a Benzyl Alcohol as a Local Anesthetic.—Dr. D. I. MACHT, of Baltimore, read a paper on this subject, which was the extension of his studies on the papaverin group of alkaloids. The benzyl esters being excreted as hippuric acid, it was thought that they would pass through the alcohol stage. Benzyl alcohol was therefore studied. The results were not what was expected. There was no therapeutic use obtained, but an important property was discovered, in testing the taste of the drug, it was found that a drop on the tongue produced numbness, and experiments

proved that this agent produced anesthesia of the sensory nerve endings. This benzyl alcohol possessed only slight toxicity. It was found in balsam of Peru and tolu and was known as phenethyl-O. The boiling point was found to be very high. It was soluble up to fourteen per cent. in water, at room temperature. All the solutions used in the clinic were 0.5 to four per cent. An anesthetic effect upon the mucous membrane was produced by the drug. Other effects were: sensory nerve paralysis; corneal anesthesia; blocking of nerve fibres, first sensory, then motor; effect on blood pressure (the heart not being affected at all); a slight sedative effect on the central nervous system. The toxicity as compared with cocaine showed that twenty c. c. injected into an animal gave no effect, whereas twenty milligrams of cocaine injected would kill an animal. It was tried out in the clinic with marked success. The anesthesia found to be fully that of cocaine. A bullet was extracted without pain, ingrowing toenails were excised, the crucial tests were in rectal cases when complete excision of hemorrhoids and excision of rectal fissure were made painlessly. In conclusion it could be stated that phenethyl-O possessed powerful anesthetic properties and low toxicity, it could be easily sterilized and was very cheap. Doctor Macht said he was especially happy that Providence had enabled him by this discovery to contribute a mite to the alleviation of the sufferings of humanity.

Dr. S. J. MELTZER, of New York, said that the speaker was to be congratulated upon the findings which he had communicated in his two papers. Did the papaverin group increase the inhibitory side of the nerve effect, or were the phenomena of the opposite nerves reduced?

Dr. T. K. BROWN, of Baltimore, said that with regard to the clinical aspect, they had been using these drugs and as yet they would not commit themselves as regards the practical value, but it was noticeable that in cases of increased irritability of the gastrointestinal tract, cases associated with diarrhoea and mucous colitis, the symptoms were very greatly relieved by the benzyl esters. Benzyl acetate was irritating to the stomach but the benzyl benzoate had a distinct use in conditions associated with spasticity of the intestinal canal.

Dr. S. SOLIS-COHEN, of Philadelphia, said that he had found benzyl benzoate of value in treatment of various forms of asthma with dyspnea and in arteriosclerosis with excessively high blood pressure. It was of great use in a particularly irritating cough, known in Philadelphia as "Hog Island Whoop." In cases where one did not care to use morphine, benzyl benzoate was a distinct palliative. Doctor Macht had made a very useful discovery.

Dr. ALFRED H. HESS, of New York, said he had used papaverin in pylorospasms and the effect of the drug on this condition could be well followed by the x ray pictures. The normal diameter of the pylorus was 1.5 cm. By the use of the mouth pills graduated in size, it could be shown that the pylorus relaxed and the stomach had passed the pylorus. The normal pylorus did not seem to be relaxed by the drug, and the pills would pass through whether papaverin was used or not.

Dr. D. I. Macht, in conclusion, said he believed the papaverin group exerted its action peripherally. This was the therapeutic action of all papaveraceae. Benzyl esters had action on the central nervous system. With very large doses one could get convulsions and respiratory paralyses. The peripheral effect on smooth muscle predominated, however, and he had not found that there was any particular effect on striated muscle. In regard to the toxicity of the benzyl esters, the herbivorous animals apparently could stand a much larger dose and could metabolize it better than the carnivora. As much as 20 c. c. per kilo weight could be given to an animal without bad effect. There might be sedative effect in very large doses. An emulsion of benzyl benzoate had been made which could be easily taken by mouth. In regard to cases where cough was relieved, he could not say whether this was a central effect or not. In pylorospasm it acted better in infants than in adults. It was of use in spastic anuresis in adults and children, due to hyperirritation of the bladder or sphincter.

Acute Pancreatitis in Typhoid Fever.—Dr. T. McCRAE, of Philadelphia, reported the case of a patient whose typhoid fever ran an ordinary course, the temperature being normal on the twenty-fourth day. On the twenty-sixth day he complained of pain in the upper right quadrant, there was jaundice and the leucocytes were 20,000. Two or three days later the pain subsided and leucocytes dropped to 10,000. Eleven days later there was a definite mass in the region of the gall bladder, somewhat tender, and a diagnosis of cholecystitis was made. The next day the pain was very severe and bloody stools were passed, blood was present in the urine, and large amounts of blood were vomited. The leucocytes were 26,000. The symptoms subsided for a time, when the pain again increased. On the fifty-fourth day of the illness operation was performed. It was found that the gall bladder, duodenum, stomach and bile ducts were normal. The pancreas was swollen and inflamed. The abdomen was closed and the patient made a good recovery, and in three weeks the mass disappeared. On the eighty-second day he was discharged perfectly well. The points to be observed in this case were that there was very little fever, never complete stoppage of bile, the stools showed no evidence of pancreatic disease. The question then arose—how often was acute pancreatitis mistaken for acute cholecystitis? How often was acute pancreatitis associated with typhoid fever? The question of hemorrhages was to be considered and this case was presented in order to correct possible errors of diagnosis.

Dr. E. LIBMAN, of New York, said he had seen this picture in cases in which he had suspected a mild form of pancreatitis. He thought a certain form of pancreatitis occurred in acute infectious disease and in suppurative conditions after abdominal operations. The diagnosis of acute pancreatitis was not so difficult as it was supposed to be. In acute hemorrhagic pancreatitis there was tenderness of the left lumbar region, marked even in patients not sensitive to pain. This question of the relative sensitiveness of the patient to pain was important. It was much more apparent in some patients than others. In acute pancreatitis the pain on the left

side could always be elucidated, and this was found in no other condition.

The Clinical Manifestations of Tropical Sprue.—This paper was read by Dr. E. J. Wood, of Wilmington, N. C. He stated that there was a great increase in the number of cases in North and South Carolina, and in Georgia. He had seen cases of tropical sprue from the East, from Porto Rico as well as Southern cases. There was only one type in all cases. Sprue was often confused with pellagra, especially by certain English writers. It was no doubt true that many cases of pellagra were complicated by sprue. Sprue needed special attention at this time because it had appeared near many of the Southern cantonments. The symptoms appeared chiefly in the tongue, in the form of small painful erosions. In the diarrhoea of sprue the feces were tremendously acid in reaction, yeasty and passed during the early morning hours. They showed tremendous loss of fat, as much as fifty-nine per cent. The nitrogen loss was fifteen per cent. Functional deficiency of the pancreas was evident, in most cases, but not all. Anemia in sprue was an essential feature. The absence of anemia in pellagra was a distinguishing feature. In sprue the anemia appeared similar to pernicious anemia. Shrinkage of the liver was seen in both conditions. The stomach content changes were fairly similar in both cases and showed a decrease in hydrochloric acid. The beef treatment of Cantley had been found the best means of therapeutics. The disease should not be overlooked on account of its proximity to the Southern camps.

Major WILLIAM H. WELCH, of Baltimore, said that in his observations on pellagra he had found buccal lesions and gastrointestinal lesions which might be referable to sprue. He would like to know to what extent pellagra was complicated by sprue. Goldberger's work would seem to show that this was one of the most difficult and perplexing questions. Not a single case of pellagra had been found to develop where diet was properly supplemented. This question of confusion between sprue and pellagra was an interesting and important one.

Dr. E. LIBMAN, of New York, said that three or four years ago he had seen a case of secondary sprue. He had asked about the loss of knee jerks and absence of hydrochloric acid but had been told that no examination had been made of the stomach contents. In this case Doctor Wood said that examination had been made; Was there diminution of acidity?

Dr. A. MCPHEDRAN, of Toronto, said that a few years ago he had seen a lady, a missionary's wife, who returned from India very much affected. Her condition was very grave, with extreme anemia, but there was no material loss of weight. Diarrhoea was very marked. The tongue had a rather glazed smooth appearance. She had recurrent attacks of vesicular stomatitis. No treatment produced any effect until she tried the strawberry diet, three or four pounds a day, and she improved on that and for two summers was greatly improved. Two years later she became pregnant and had a very marked mitral stenosis. It was believed best to do Cæsarean section three weeks before term. The

child was viable. The mother did well for a few days then developed sepsis and died.

Dr. S. SOLIS-COHEN, of Philadelphia, said he had seen a teacher, returned from Porto Rico, with an undoubted case of sprue. She showed very marked nervous and mental symptoms. He would like to know what was the experience of the members as regards the association of mental symptoms, whether this was a coincidence or not.

Dr. T. R. BROWN, of Baltimore, said that he had seen two cases from Porto Rico. The stomach contents showed complete achylia. Under treatment the stomach contents returned to normal as regards hydrochloric acid.

Dr. E. J. Wood, in conclusion, said Doctor Welch had mentioned the work of Goldberg, he was evidently in close touch with the situation. He did not think there had been any work in American preventive medicine more important than this differentiation between the two diseases, unless it were the work of the Rockefeller Institute on uncinariasis. The point to decide was when did sprue begin to complicate pellagra. The pellagra tongue had a different appearance, being a much deeper red accompanied with profuse and painful salivation. In sprue the tongue was furred and dry because of the absence of salivation. The intake and output of nitrogen had been studied in the two diseases and in pellagra this was normal. Pellagra was a seasonal disease running from May to August. In sprue the diarrhoea instead of ending, continued; the stools were light colored and more acid. Anemia was not associated with pellagra but in sprue it was essential for diagnosis. In answer to Doctor Libman, there was an absolute absence of hydrochloric acid in sprue. In regard to the nervous disturbances mentioned by Doctor Cohen, these disturbances were marked in pellagra, and perhaps the case mentioned was really pellagra and not sprue. Doctor McPhedran referred to the strawberry diet, that had not been found of any service. Santonin and emetin had been discarded as worthless. No treatment except dietetic control and rest for a prolonged period had been found of any avail.

Bacteria of the Intestinal Tract.—Dr. W. W. FORD, of Baltimore, presented the results of further observations on the bacteria of the intestinal tract. The Gram positive bacteria found in dejecta were found to be aerobic forms due to ingestion of milk, water, etc. and occurred in foods upon which children were nourished. A study was made to find out if these large Gram positive organisms could be anaerobic. The stomach and portions of the intestinal tract of calves were studied. Large Gram positive organisms were obtained from every part of the intestinal canal. It was the same in Princeton or Baltimore, the Gram positive spore bearing bacteria were found normal to the intestinal canal. Anaerobic cultures were always negative, the organisms were always aerobic. Differences were found in organisms grown in intestinal juices and those grown on artificial media. A search was made to see if encapsulated bacteria could be found in the dejecta and by a new method of staining by carbol fuchsin (which proved a valuable contribution to bacterial technique) it could be determined whether there

were capsulated bacteria in the intestine or not. It was proved that there were no encapsulated forms present above the ileocecal valve. Below this valve there were present Gram positive organisms encapsulated, of the morphology of the gas bacillus aerobes were found above the valve, anaerobes below the valve. The general applicability of these facts to man was then considered. In Baltimore milk there were present spore forming gas bacilli. In the neutralized whey were found hemolytic substances, due to bacteria. These were toxic for rabbits and guinea pigs in subcutaneous inoculation. If the whey were filtered, the filtrate was also toxic. It was found that milk cultures of the gas bacillus were always poisonous to animals. Work was now being done to determine whether this organism was vegetative in the intestinal tract. It would then be possible when to determine whether this bore any relation to the question of the production of scurvy by the feeding of children with pasteurized milk.

Major W. H. WELCH, of Baltimore, said he would like to know whether toxin had been demonstrated in the milk and if so whether the carbohydrate content of the milk had been reduced. If this was not done, the acid formed was destructive to the toxin.

Major SIMON FLEXNER, of New York, said the chief factor influencing the degree of toxicity of the cultures which Doctor Ford had described was the control of the carbohydrate. There were at present unknown differences in the toxin producing powers of the various strains of the Welch bacillus, these were similar to conditions relating to the diphtheria bacillus. In regard to milk cultures, the toxin producing power should be determined not only in milk but in other media. The toxic power had an almost infinite degree of gradation.

Dr. W. W. FORD, in conclusion, said that he had tried two methods of increasing the toxicity of the milk cultures; first, he had tried to get milk whey in which lactose was taken away, but the gas bacillus did not multiply well in milk of that character; second, the acidity of the milk was then neutralized by the addition of powdered chalk and it was found that the filtrate from such milk cultures was more marked in toxicity. Doctor Flexner had brought up an interesting point. In the study of pasteurized milk they had been forced to limit their observation to study of such organisms as might be obtained from this source. The gas bacillus obtained from soil and other sources would be more poisonous than that from milk. The variation of toxicity in strains was marked. The first culture obtained had a high toxicity which gradually diminished as the result of repeated passage. They never got such a good strain again. The toxic production by the gas bacillus in other media than milk had not been determined. It was premature to attempt to answer the question as to whether pasteurized milk ever would develop poisonous properties. In the majority of cases the gas bacillus exists as an organism, free in the form, but observations so far did not indicate that there was any vegetation there. Probably the same thing would hold true for the typhoid bacillus.

(To be continued.)

Book Reviews.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

A Reference Handbook of the Medical Sciences. Embrace the Entire Range of Scientific and Practical Medicine and Allied Science. By Various Writers. First and Second Editions Edited by ALBERT H. BUCK, M.D. Third Edition Completely Revised and Rewritten. Edited by THOMAS LATHROP STEDMAN, A.M., M.D. Complete in Eight Volumes. New York: William Wood and Company, 1917.

The completion of this series gives an opportunity to call attention to the many valuable points of such a work, for of its kind, we consider it one of the best ever coming from American workers. Conceived in a broad spirit, furthered by indefatigable effort, and finally achieved in expeditious and satisfactory form, the present large edition of the Reference Handbook of the Medical Sciences stands out as a unique and praiseworthy performance. It is undoubtedly a complete library of medical sciences. The captious critic will undoubtedly find gaps. Certain things left out, certain subjects more or less indefinitely treated, but in the main, there is such a high level of excellence that such criticism would approach censoriousness. Had we the time and space, we should like to call attention to certain monographs which have appeared in these volumes, but they are too many. Buy the volumes and enjoy them.

A Textbook on Gonorrhea and Its Complications. By Dr. GEORGES LUYLS, Lat Assistant to the Urological Clinique, Hôpital Lariboisière, Paris; Prizeman of the Faculté de Médecine, Paris; Chief Medical Officer of the Urological Centre at the Military Hospital, Versailles. Translated and Edited by ARTHUR FOERSTER, Captain, R. A. M. C. (T.C.), M. R. C. S., L. R. C. P. (Lond.), Late Resident Medical Officer, London Lock Hospital. Second Revised Edition, With 201 Illustrations and Three Colored Plates. New York: William Wood & Co., 1917. Pp. xxi-386. (Price \$6.)

The author begins this excellent work with a history of gonorrhea dating from the time of Moses. While not essential, this history is very entertaining and shows that the ancients had some appreciation of the scourge, though their treatment was for the most part ludicrous. It takes up different phases of the subject, such as Anatomy of the Urethra, Pathology, Diagnosis, etc., in most orderly fashion, and especial stress is laid on urethroscopy and the complications of gonorrhea. Doubtless many of the chronic cases which we all encounter and which resist treatment so obstinately would be cleared up if we would more frequently employ the urethroscopic methods of diagnosis and treatment as advocated by Luyls, this being especially true of lesions of the anterior urethra which most of us are inclined to regard too lightly. I think, however, the author, in accord with the tendency of the times, is rather inclined to attach more blame to the verumtantum than it deserves.

The subject of Gonorrhea in Women is well handled and, fortunately, discussed in detail. Most general textbooks on the subject have rather given this important phase of it a lick and a promise. The chapter on Vaccine and Serum Treatment is quite timely in view of the fact that there is at present so much discussion concerning treatment by these methods.

A recent addition to Abortive Treatment of Gonorrhea which the author might well have included is the sealing up of a weak solution of argyrol in the urethra for a number of hours. This is now being done with marked success in the British Army base hospitals.

The illustrations are uniformly good, especially those illustrating the pathological pictures of the urethra as seen by the urethroscope.

If there be any adverse criticism it is that the author gives too much instead of too little without stressing the value of a particular method of diagnosis or treatment. The work is, therefore, of more value to the specialist than

as a textbook for the student, who might easily be confused by the comprehensive manner in which the subject is covered.

State of New York. State Hospital Commission. Twenty-eighth Annual Report. October 1, 1915, to June 30, 1916. CHARLES W. PILGRIM, M. D., ANDREW D. MORGAN, FREDERICK A. HIGGINS, Commissioners. Transmitted to the Legislature, January 19, 1917. Albany: J. B. Lyon Company, 1917.

A review of the activities of any of our States in taking care of the mentally ill is always interesting to the statistically inclined, but aside from this, every succeeding report of such a body as the New York State Hospital Commission marks a distinct advance in the care of such patients. No longer are rigid economies lauded and the superintendent who gets along with the least money held up as a model, but stress is laid on the patients themselves, their mental conditions, with their causative factors, their treatment and return to the world. Of course an official report of this kind must contain much of a purely statistical nature, but there is also much space devoted to discussing of psychiatric problems, especially those bearing on etiology, treatment, recurrence, and the like. The work of the Psychiatric Institute is deservedly praised and it is recommended that its usefulness be increased by a building of its own and more funds. The book is illustrated by pictures showing activities of patients and there are a number of charts.

Births, Marriages, and Deaths.

Died.

ANDREWS.—In Philadelphia, Pa., on Wednesday, May 8th, Dr. Thomas Hollingsworth Andrews, aged seventy-five years.

BARDWELL.—In Tunkhannock, Pa., on Sunday, April 14th, Dr. Frank Judson Bardwell, aged fifty years.

CAMPBELL.—In Flushing, N. Y., on Wednesday, May 8th, Dr. Archibald Campbell, aged seventy-six years.

CARTWRIGHT.—In Sacramento, Cal., on Thursday, May 2nd, Dr. Charles Ogden Cartwright, aged fifty-eight years.

CHASE.—In Denver, Colo., on Friday, May 3d, Dr. John Chase, aged sixty-one years.

COWAN.—In London, Ontario, on Sunday, May 5th, Major Thomas Connolly Cowan, Canadian Army Medical Corps.

DRIVER.—In Cambridge, Mass., on Tuesday, May 21st, Dr. Stephen W. Driver, aged eighty-five years.

ENSIGN.—In Rutland, Ill., on Wednesday, May 8th, Dr. William O. Ensign, aged seventy-six years.

GROETSCH.—In New Orleans, La., on Tuesday, May 7th, Dr. Charles William Groetsch, aged forty-one years.

HEIDNER.—In Long Beach, Cal., on Friday, May 3rd, Dr. Gustav Adolph Heidner, of West Bend, Wis., aged fifty-four years.

HILL.—In Irontone, Wash., on Thursday, April 18th, Captain Richard C. Hill, M. R. C., U. S. Army, aged fifty years.

JETT.—In France, on Saturday, April 13th, Captain Richard Lawrence Jett, M. R. C., U. S. Army, of Cleveland, Ohio, aged thirty-two years.

MACY.—In Kings Park, N. Y., on Tuesday, May 21st, Dr. William Austin Macy, aged fifty-six years.

REILY.—In Fulton, Mo., on Thursday, May 2nd, Dr. Walter E. Reily, aged forty-seven years.

SANDERS.—In Cincinnati, Ohio, on Sunday, May 5th, Dr. Addison Fitzhugh Sanders, aged fifty-two years.

VINCENT.—In Springfield, Ill., on Thursday, May 16th, Dr. John Alexander Vincent, aged eighty-seven years.

WELKER.—In Washington, D. C., on Wednesday, May 21st, Captain Henry Clement Welker, M. R. C., U. S. Army, of Norristown, Pa., aged thirty-eight years.

WORSHAM.—In El Paso, Tex., on Thursday, May 2nd, Dr. Benjamin M. Worsham, aged fifty-five years.

YUTZY.—In Ann Arbor, Mich., on Friday, May 3rd, Dr. Simon Menno Yutzy, aged sixty-one years.

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Original Communications

PNEUMONIA AND ITS TREATMENT.*

*The Specific Plan With Serums and Bacterins.
The Definite Plan, With Quinine Salts, Pituitrin, and Digitalis.*

By SOLOMON SOLIS-COHEN, M. D.,
Philadelphia.

Professor of Clinical Medicine in Jefferson Medical College.

That the policy of "masterly inactivity" in the pneumonias of adults is not attended with brilliant results is self evident. Scarcely better is the "armed expectancy," that many of us were taught and have been guilty of teaching. Twenty-five years ago the students of mortality tables and hospital records told us that in pneumonia, twenty-five per cent. of the patients would die and seventy-five per cent. recover, whatever the treatment or lack of treatment. Seasonal variations were admitted, increasing or diminishing temporarily the death toll; allowances were made for age, sex, alcoholism and other factors influencing the fate of individuals; but in a long series of years, twenty-five per cent.—so it was stated—was the expected and realized mortality.

With the progress of science, with earlier diagnosis, with better public hygiene and increased hospital facilities, a lessening of this death rate might reasonably have been hoped for. On the contrary, while typhoid mortality has become almost negligible, while diphtheria has been shorn of its terrors, while tuberculosis has been measurably conquered, pneumonia has increased in prevalence and in the relative as well as the actual number of deaths. The general mortality is now stated as varying from thirty to fifty per cent., and as making up about one seventh of the deaths from all causes. In other words, the pneumonias have become the most important and most deadly acute infections of temperate climes. One who has faith in the therapeutic art, cannot but attribute this "progress backwards" to the *laissez faire* methods, which until recently, dominated American colleges and hospitals, under the influence of teachers trained Teutonically—skilful diagnosticians, erudite pathologists—but therapeutic sceptics, if not nihilists. There has been, however, one exception to this scepticism. Specific methods—the use of serums and bacterins (so called vaccines)—have been advocated both by scientific investigators and by empiricists. The many

failures need not be recounted. The present status of specific therapy has been set forth by the reader of a former paper. To recapitulate briefly:

I. SERUMS.

A. *Type serums.*—The strictly specific antipneumococcus serum, Type I, as produced by Cole at the Rockefeller Institute gives excellent results in infections of Type I.

When the treatment can be begun early and sufficient serum is available, a recovery rate of from ninety-five to ninety-seven per cent. may be expected. When treatment is late, or when the serum is not used in sufficient quantity, the mortality rises to eight or ten per cent. or more. Suppurative complications are not diminished by serum treatment.

Against infections other than Type I, efficacious specific type serums are now not available.

B. *Polyvalent serums.*—From personal observation of a limited number of cases, and from reports of others, I think I can say that there is no direct proof that polyvalent serums are harmful. I have seen no evidence that they are helpful, except in type I; and in this the type serum is to be preferred.

II. BACTERINS—SO CALLED VACCINES.

In speaking of the use of preparations of killed bacteria, *i. e.*, emulsions or suspensions of bacterial proteins, let me say incidentally that the terms *bacterin* and *bacterination* which I prefer to "vaccine" and "vaccination" are not proprietary or copyrighted terms. They were introduced into the literature by me more than twenty years ago, and were adopted by Dr. Joseph McFarland in the articles contributed by him to my *System of Physiologic Therapeutics* in 1900 and 1905. Their use by manufacturers, therefore, is the proper following of a scientific lead. I say this in answer to queries I have heard as to the propriety of using the terms. They belong to no firm and no person—but are now common property.

Concerning the value of bacterins in treatment, there still exists much difference of opinion. In the general stimulus to the use of "bacterial vaccines" which followed Wright's opsonic studies, pneumonia shared. Observers of experience and repute published contradictory statements, from the most optimistic to the most distinctly negative. The separation of types led to renewed trials of strictly specific bacterins, but still without producing a definite consensus of opinion, perhaps the majority of physi-

*Read in a symposium before the Philadelphia County Medical Society, March 13, 1918.

cians remaining opposed or, at least, sceptical. Moreover, it has been generally held by teachers of authority—although not so held by practising physicians in general—that in any event only monobacterial “autogenous vaccines” should be used; and that even these should not be resorted to early in the case, since they might increase the burden of toxemia. I must confess that to a certain extent I have shared these views; and my chief experience has been made with “personal” bacterins—i. e., cultures prepared from the patient’s “deep sputum”—used after the third or fourth day, in obstinate cases, or after subsidence of acute symptoms in cases of delayed resolution. Cases of delayed resolution are more frequently met with under the definite treatment than under expectant treatment. The reason is the same as for the increase in cases of postdiphtheric paralysis in the early days of antitoxin. The patients survive with unresolved patches in the lungs, instead of being buried or cremated in that condition. I have not, however, insisted on a monobacterial preparation. Usually the sputum shows a mixed flora of staphylococci, streptococci, micrococcus catarrhalis, and perhaps influenza bacillus and other microorganisms, in addition to the pneumococci, which last are, not rarely, of more than a single type.

All these are represented in the preparation used. It may be injected or given by mouth in serum, saline solution or skimmed milk before breakfast. The initial dose contains about 100,000,000 killed bacteria (if injected; double that number if swallowed). The quantity is progressively increased by 50,000,000 or more at each succeeding dose, according to result. The bacterin is given daily or on alternate days until febrile reaction occurs, and then intermitted for three, five or seven days, according to the intensity of the reaction and the general progress of the case. After that it is continued about every third day (but sometimes fifth day, or even seventh day) until resolution is complete.

From time to time I have used bacterins early (necessarily of stock cultures, both monobacterial and mixed) in selected cases, and sufficiently often to convince myself that they “do no harm.” Last fall at Blockley I used them freely in conjunction with the “definite” medicinal treatment of which I shall speak later; but that experience, although favorable, was not sufficiently extensive to warrant positive conclusions.

Recently I made a visit to Fort Oglethorpe and, while there, observed the treatment of pneumonia at the Post Hospital. I wish I had time to dilate on the good work in general being done there by Colonel Haverkamp and his staff, who have proved more than equal to the demands of the rapid expansion of the camp and the serious emergencies with which they have had to deal. But I shall only speak of the remarkable results in the pneumonias obtained by three of our colleagues of the Medical Society of the State of Pennsylvania, Major Charles H. Smith, late of Uniontown, and Captains Arthur Dare and D. H. Bergey, lately of this city. Doctor Bergey has been the laboratory man, Doctor Smith and Doctor Dare the clinicians, and the cooperation between the laboratory and wards has been ideal.

Formal report of this work will be made to the Surgeon General, and until then I can only speak in general terms, but I may say that the record of mortality of less than six per cent. in more than 100 cases is not excelled, if indeed equalled, anywhere.

The treatment is based upon a theory put forth by Dare in conjunction with H. A. Hare, in a paper published in the *Medical News* of 1904, that the complicating pus organisms (streptococci and staphylococci) are responsible for the prolongation of lobar pneumonia beyond the fifth day, and for much of the toxemia as well as the suppurative sequelæ. By the use of mixed bacterins, given from the first, it was hoped to prevent these effects and bring about a generally beneficial change in the evolution of the malady.

These hopes seem to have been realized in a series of cases sufficiently large and varied to warrant formation of opinion; at a time and under circumstances, moreover, which do not permit the attribution of the good results either to seasonal variation or to an exceptionally good type of subjects. Not only was the mortality lessened, but the duration of disease shortened, the patient’s comfort promoted, and the incidence of suppurative complications decreased almost to a negligible point. In bronchopneumonia, both primary and following measles, an almost equally favorable influence was observed.

I am permitted to quote the composition of the “combined vaccine.” It is:

Pneumococci Type I.....	125 millions
Type II.....	125 millions
Type III.....	50 millions
Streptococci	225 millions
Staphylococci	225 millions
(Aureus, albus, and citreus)	
Micrococcus catarrhalis.....	50 millions

Of this combination, an initial dose of 125,000,000 (total) is given hypodermically before the disease is typed. Three days are allowed to elapse to produce an immunity. Then (seventy-two hours after the initial dose), 250,000,000 are given. Every third day an increased dose follows. The series is, therefore:

1st day	125 millions, initial dose.
4th day	250 millions
7th day	300 millions
10th day	350 millions
13th day	500 millions

Seldom were more than two or, at most, three doses required for the average case of lobar pneumonia. The mixture has been given up to 500,000,000 to assist after draining, in clearing up empyema in cases in which Type I serum had been employed in Type I pneumonia.

Resolution of the pneumonic lesion is the guide to repetition of the dose. In the average case there occurs on the fifth day, a fall in temperature to normal or 90.5° in the morning. The râle redux and vesiculobronchial breathing are heard. Temperature may rise again to 100° that evening and then run a normal course unless empyema or other complications are present. In twenty-four hours the physical examination shows normal breath sounds and voice conduction, indicating complete resolution in cases of Types II, III, and IV. In Type I cases treated with Type I serum, the crisis

usually occurs on the sixth day and the lungs clear up a trifle more slowly.

The bacterin works fully as well with Type I as the serum, but as the Type I serum is supposed to be specific, Smith and Dare employ it. Empyema and suppurative complications in general are more frequent with serum cases than with bacterin cases.

While I still feel that "personal bacterins" are to be preferred when obtainable promptly, this excellent record with the routine mixture of bacterins described, as prepared by Bergey, tends also to give one a certain confidence in the stock commercial preparations—provided these have been prepared by trustworthy manufacturers and properly preserved. Certainly for military practice, as well as for the physician in civil life who does not have easy access to a laboratory, they are at least worthy of much more extended trial.

As I have previously urged before this society, we must recognize that the excitation of immunizing processes is not exclusively specific; and by standing out for theoretically exact specificity in our therapeutic antigens, we are limiting our resources needlessly.

I may add that the Oglethorpe staff is encouraged to attempt preventive immunizing bacterination against pneumonia, and the work has already begun.

I am in hope that an important blood reaction seen by Dr. J. D. Heist in our studies at the Mastbaum Laboratory of the Jewish Hospital will enable the fact of immunity or its absence to be demonstrated without waiting for the statistics of exposure and incidence.

DEFINITE TREATMENT.

Midway between the accuracy of the specific treatment and the vagueness of the expectant treatment stands what I have termed the *Definite Treatment*. This utilizes in a definite way, upon definite indications and for definite purposes, certain agents and measures long known, and one of more recent introduction. The well known agents are quinine, camphor, digitalis, and alkaline saline beverages or infusions. The more recent one, which I believe was first used and advocated by me, is the active principle of the posterior pituitary body—"pituitrin," "hypophysin," "infundibulin," "pituitary liquid," as it is variously called. The well known measures are fresh air, disinfection of the upper respiratory tract, counter irritation, local heat, bleeding, and free elimination by skin, bowel, and urinary tract. Discussion of these last is unnecessary except to emphasize the importance of keeping the urinary output up to at least two, and if possible, three litres daily.

In addition, the definite method utilizes as needed, lavage of the stomach, antiseptic swabs, sprays, gargles, and inhalations, oxygen, creosote, alcohol, strychnine, atropine, opiates, bromides—and indeed anything indicated for a special purpose. But these are auxiliaries not always called for; nor are they all to be used in any one case. With the exception of gastric lavage they will not be further referred to.

The main agents, however, call for somewhat detailed discussion in order to clear up misunderstandings, and answer numerous inquiries from professional colleagues the country over.

QUININE.

Let it be said at the outset, to prevent misunderstanding, that quinine is not used for its antipyretic effect. That is a part of its action, of course, but it is not the direct purpose of the treatment. The reduction in temperature is utilized, however, as a guide to the administration of quinine. It is an index to the extent of quinine influence, and therefore helps us in arriving at a safe dose and the time of repetition. The questions of safe dose and frequency are highly important.

Experiments upon animals show that quinine is toxic and that the minimum (single) lethal dose by intravenous injection is about 0.06 gram per kilo; equivalent to about 3.6 grams (fifty-five grains) for a man weighing sixty kilos (125 pounds). By intramuscular injection the minimum lethal dose for animals is 0.5 gram per kilo, which is apparently equivalent to thirty grams (one ounce) for a man weighing sixty kilos. I doubt, nevertheless, whether even half of these quantities, as a single dose, intravenously or intramuscularly, would be tolerated in man; and do not care to make the experiment. A very much smaller dose, say two grams (thirty grains), as we well know, will, even by mouth, induce in a normal individual pronounced cinchonism; and with a dose of four grams (sixty grains) one might expect amaurosis and perhaps permanent blindness. Pneumonia patients, however, exhibit a marked tolerance to quinine. Of this, more will be said later.

In animals fatally poisoned by quinine, death takes place by cardiac paralysis, and is attended with a considerable fall of blood pressure. This is taken into consideration in the "definite treatment" and the use of pressor agents is an integral part of the plan. Of course, animals of different species and individual animals, like individual men, differ in their susceptibility to quinine. Also, the various quinine compounds differ in degree of toxicity. Hence the figures given must be taken as an approximate average, not as an exact mathematical statement.

Of all the cinchona derivatives, *ethyl hydrocuprein* (Morgenroth's "optochin") is the most toxic, requiring the smallest minimal lethal dose for animals; and in its therapeutic administration, as reported, it very frequently produces severe cinchonism and even permanent blindness in man, although used in comparatively small doses. Optochin has therefore, in my judgment, in so far as pneumonia is concerned, failed to achieve the purpose for which it was introduced by Morgenroth. His object, it will be remembered, was to produce by chemical modification of the quinine molecule, a new compound which should be superior to quinine in pneumococcal infections by virtue of its increased specific germicidal activity against the pneumococcus.

The increased germicidal activity is beyond question. In the studies made by Heist, Kolmer, and myself (*Journal of Infectious Diseases*, vol. XX, No. 2, March, 1917), we found, confirming previous observers, that by the test tube method (which Kolmer has termed the antiseptic method) optochin is fatal to pneumococci in dilutions ranging from 1:1,

000,000 to 1:2,000,000; while by a plating method, it inhibited growth in a dilution of 1:100,000, and killed the germ in dilutions of 1:40,000; showing an activity ten times as great as that of any salt of quinine used in the comparative experiments. As a germicide, therefore, optochin stands incomparably in the first rank; and in local infections with the pneumococcus is unrivaled as a topical application.

Its therapeutic value as a systemic medicament in pneumonia, however, is not only no greater, but distinctly less, than that of the average quinine compound. For this there are two reasons: First, to put it technically, there is too small an interval between the therapeutic dose and the toxic dose; that is to say, there is great risk of poisoning, and even of death, from the drug itself, when employed in effective doses in human beings sick with pneumonia. Second, there is the great outstanding fact that pneumonia in human beings is not merely a pneumococcus septicemia; and that something more than germicidal activity is required of the therapeutic agent. This "something more," whatever it may be, quinine possesses in marked degree; but in the synthesis of optochin, it has apparently been taken out of the molecule by the very change which increases germicidal power. For local infections and for pneumococcus septicemia in experimental animals, therefore, optochin is somewhat superior to quinine; but for the treatment of pneumonia in man it is distinctly inferior.

This is shown not only by the experiments upon animals reported in the paper already alluded to (*Journal of Infectious Diseases*, vol. xx, No. 3, March, 1917), but also by clinical studies at the bedside. The results obtained with optochin are not equal to those obtained with quinine; and even when the drug is reinforced by specific serum (an almost ideal method), they have been, in general, little, if at all, better than those obtained by the use of quinine without the serum.

Previous to Galbraith's report (1904) of his great success with massive doses of quinine by the mouth, I had used the drug frequently, but only in selected cases. Following this report, I began its systematic routine employment. The intramuscular method of administration was chosen, and quinine and urea hydrochloride selected as the particular quinine compound to be used, because for twenty years previously I had had such excellent results from this compound and this method in the treatment of malarial infections, acute and chronic (*The Polyclinic*, Philadelphia, February 15, 1884; *American Journal of the Medical Sciences*, September, 1908).

In 1911, when I reported the experience of seven years of systematic use of massive doses of quinine in pneumonia, I was still using the same salt and the same method. Since then, however, I have been accumulating experience with other quinine compounds and various methods of administration.

First, as to other salts of quinine. Aufrecht and Petzold (*Deutsch. Arch. f. klin. Med.*, 1901, 70, p. 373), and, following them, F. P. Henry, of Philadelphia, employed quinine chlorhydrosulphate by hypodermic injection, and reported excellent results. Juergensen (Von Ziemssen's *Cyclopedia of the Practice of Medicine* (English Translation, 1875, p. 165, as likewise Gal-

braith a generation later, used quinine sulphate, or bisulphate, giving it by the mouth.

The studies made for me by Heist and Kolmer showed that quinine hydrobromide and quinine dihydrobromide are fatal to pneumococci by the antiseptic method in dilutions of 1:100,000 to 1:200,000, and that these salts likewise possess the exceptional quality of being twice as active bactericidally in serum as in salt solution. Optochin loses from eighty to ninety per cent. of its bactericidal activity in the test tube by the change from salt solution to serum, while quinine and urea hydrochloride undergoes a loss of about ten per cent.

I have, therefore, since these observations were made, been trying out clinically the compounds of quinine with hydrobromic acid in about one half the cases treated. When oral administration is necessary, they seem to be more active than the compound with urea; that is to say, they apparently produce an equivalent fall of temperature in smaller doses (the temperature curve, it will be remembered, is taken as an index of the drug's total influence). By the intramuscular and intravenous routes there seems to be no great difference.

Dose and administration. When circumstances permit, it is advisable to give at least the first dose by aseptic intravenous injection; otherwise by intramuscular injection through iodized skin and with proper precautions. Subsequent doses may be given in the same way as the first, or by the mouth. If the injection methods are impracticable, oral administration may be used at first and throughout; but its effects are less prompt.

For *intravenous and intramuscular injection* I prefer the quinine and urea hydrochloride, although the chlorhydrosulphate, the dihydrochloride and the dihydrobromide are also eligible. The question is chiefly one of solubility. It is possible, however, that the urea molecule in the double hydrochloride of quinine and urea plays some rôle, as yet unknown, in the complicated chemistry of therapeutic, toxic, bactericidal and metabolic influences, that gives to the salt containing it an apparent clinical advantage.

For oral administration, I prefer either the quinine and urea hydrochloride or the dihydrobromide, encapsulated. The initial dose by the mouth for a young, robust adult should be not less than 1.6 grams (twenty-five grains); by intramuscular injection, not less than 1 gram (15 grains) in extemporaneous fifty per cent. solution in boiling water; by the vein, not less than 0.6 gram (ten grains) in one half to one per cent. solution, in distilled water, or in saline solution (NaCl 0.85 per cent.), or in one half per cent. solution in a two per cent. solution of a mixture of primary and secondary sodium phosphates (1:8) in saline solution or distilled water.¹

These quantities may be exceeded in so called sthenic cases, with high fever and hard, pounding pulse. For the aged, and for children of fifteen years or less, they should be reduced about one half.

The first dose, however, is tentative, and upon its effect, as shown within three hours, will depend the size of the second dose and the frequency of repetition. Sometimes only a single dose is needed; some-

¹Sufficient of the phosphate solution is used to neutralize but not precipitate the quinine.

times three or four doses will be sufficient; sometimes ten or fifteen doses or more are required. For a convenient index of effect, as already stated, the temperature curve is taken, and, in the absence of counterindication, the standard dose of 0.6 to 1.6 grams (ten to twenty-five grains) is repeated every third hour by vein, muscle or mouth, until the temperature falls some two or three degrees to about 102° F., and remains at or below that (approximate) figure. After that the drug is given every fourth hour, or every sixth hour, or at longer periods, as may be required to maintain the effect. Also, the size of the dose is varied in accordance with the degree of influence, and the apparent needs and reactions of the individual patient; being increased or diminished—and usually diminished—as circumstances may indicate. In other words, individualization, which is part of all rational therapeutics, applies here as everywhere.

Thus, if temperature is distinctly reduced but not to the 102° mark, the dose may be reduced to ten grains. At times a dose of five to ten grains by the mouth is given routinely every third hour, even if temperature falls below 102° F.; or if the temperature is only 102° F. to begin with, the initial dose is given nevertheless. The aim is to get the patient under the complete influence of quinine as soon as possible, using as much as is necessary for that purpose; and afterward to continue the effect with the smallest quantity that will give results.

In this connection, emphasis must be laid upon the fact previously mentioned, that pneumonia patients exhibit a peculiar tolerance toward quinine. Even mild cinchonism develops so rarely under enormous and long continued doses, that one is tempted to doubt the diagnosis in the few instances in which it is observed. I have seen it less than half a dozen times in considerably more than 600 cases. On the other hand, in another half dozen instances of an opposite kind—patients with quinine idiosyncrasy who have contracted pneumonia—it has been found possible to give doses of the drug that under normal conditions would drive the subject crazy, without inducing the slightest discomfort; and, as it happens, in every one of these instances, with uncomplicated recovery from the malady. In two of these patients the attempt was made, a year after recovery from pneumonia, to test the continuance of the anticholinergic effect. In both, quinine symptoms quickly developed after a dose of five grains, given without informing the patients what they were taking.

To summarize:

The dose of any quinine salt by any method of administration is: enough to produce results and no more.

Gastrectasia and Its Treatment.

PRESSOR AGENTS.

Cocaine hydrochloride (one half to one grain, 0.03 to 0.06 gram) posterior pituitary preparations (one mil of the commercial solutions) and epinephrine preparations (one mil of the 1:1,000 solution of adrenalin hydrochloride) were used as pressor agents in the early years of the definite treatment, without special preference for one or another, until experience should demonstrate which was best. I have now settled upon the pituitary

preparation for two reasons. Its effect is greater than that of cocaine; and while less prompt, much more lasting than that of adrenalin; and, moreover, introduced simply for its pressor effects, it proved to have the additional advantage of tending to prevent tympanites, and of helping to overcome that symptom when present.

Since I first pointed out this secondary value of pituitrin, it has been confirmed by so many writers that I need not dilate upon the fact, except to emphasize some features which, seemingly, are not even yet thoroughly well known.

In the first place, pneumonic tympanites is not intestinal only or chiefly; but is frequently a manifestation of dilatation of the stomach. Percussion to the left of the xiphoid in pneumonia is as important in routine examination as percussion to the right in typhoid fever. When even a moderate gastric dilatation is indicated by the extent of tympany or hyperresonance in this region, and before hiccough or general distention occurs, the stomach should be immediately washed out with a sufficient quantity of hot alkaline solution (*e. g.*, sodium borate one to five per cent.) and hot compresses placed over the epigastrium. The pituitary preparation should then be injected intramuscularly every hour, or if preferred, every two hours in alternation with eserine salicylate (one milligram or one sixtieth grain)—that is, one or the other hourly. This should be kept up for four hours, or longer, if necessary. If hiccough has occurred and is not relieved by the lavage, scopolamin hydrobromide (one fourth to one milligram or 1/250 to one sixtieth grain) with or without morphine sulphate (five to fifteen milligrams or one sixteenth to one quarter grain) may be added to the eserine.

Intestinal distention is to be treated in practically the same manner, with perhaps lavage of the colon instead of gastric lavage—milk of asafetida being added to the solution. Also a turpentine stupe may be substituted for the epigastric compress.

To return to the pressor influence of pituitrin and like preparations: Two considerations dictated their employment: massive doses of any quinine salt—and this is even more marked with optochin—tend to lower blood pressure by cardiovascular depression. To guard against this, the pressor agent is injected simultaneously with the first dose of quinine. It may be given by the mouth also, but is not so prompt in action, and not nearly so efficacious. Twice the dose (and probably twice the frequency) will be necessary. As pointed out by Gibson of Edinburgh and emphasized by Hare of Philadelphia, the systolic blood pressure curve in pneumonia, if charted in millimeters of mercury on the same vertical as the heightened pulse frequency curve in beats per minute, tends to fall below the latter, whereas normally it is some sixty to seventy points higher. This indicates a dangerous degree of vasomotor depression. As the pressure curve rises, and the pulse frequency curve falls, the prognosis becomes better; and when the pressure passes again to ten or twenty points beyond the pulse, recovery is to be anticipated.

Gibson spoke only of the prognostic value of this relation; and many subsequent observers have denied it. My own experience amply confirms it, however, and I rely on it with as much confidence

as on any fact of clinical observation. It is not infallible, but when taken in consideration with all other features of the case, it is a valuable guide.

Hare emphasized its therapeutic significance as a guide to the use of cardiovascular stimulants. It is this feature that has been incorporated into the definite plan. So long as the systolic pressure curve is less than five points higher than the pulse curve, the pituitary injections are repeated every third hour. If greater effect seems required, cocaine is given alternately, or cocaine, camphorated oil (two minims—thirty minims, of the twenty per cent. solution) and pituitrin are used in succession, one or the other hourly. It is said that camphor interferes with quinine. I have not observed this. Camphor alone has been urged as a sort of specific in pneumonia. My own experience has been confined to its use for special indications. Subjects of arteriosclerosis, however, may be given the benefit of their abnormal arterial pressure; pituitary and its auxiliaries being omitted. Thus, in cases of patients with systolic pressures ordinarily exceeding 180 (and even 200) millimeters of mercury, I have observed the curves fall to 150 or less during pneumonia; and in some cases in which depressor agents, such as aconite and veratrum viride, were needed prior to the attack, the necessity for such medication has not recurred for twelve months or more after recovery from the "lung fever."

DIGITALIS.

Foxglove has perhaps a double part to play in the treatment of acute pneumonias. Some physicians rely upon it almost exclusively, attributing to it the same place that in the definite treatment is at present given to quinine. They use it in very large doses, as much as thirty minims of the fluid extract being given every two or three hours, until its effect upon the heart is manifested in the pulse. I have read somewhere, but have mislaid the reference and have not been able to find the article again, some account of test tube experiments in which digitalis is stated to have exerted a neutralizing influence upon the poisons of the pneumococcus. Be this as it may, these two clinical facts are beyond dispute:

That when digitalis alone is used, its characteristic effects upon the circulation are manifested only with enormous doses, and sometimes only when such doses are given from the outset.

When quinine is used in the large doses advocated as part of the definite treatment, digitalis effects can be produced with smaller (*i. e.*, ordinarily full) doses of the drug.

The explanation of these phenomena is quite beyond the scope of these remarks. The practical rule deduced therefrom is based upon an observation concerning the relation between the diastolic pressure curve (charted in the millimeters of mercury) and the respiration curve (in excursions per minute) somewhat similar to the Gibson (pulse systolic pressure) ratio discussed in connection with pressor agents. Danger is indicated by approximation of these curves—*i. e.*, a descent of the diastolic pressure curve to sixty, or an interval of less than ten points between it and the respiration curve, irrespective of the exact figures of either. A dose

equivalent to twenty minims of a good tincture of digitalis (digalen; digipuratum, digifolin, digipoten Abbott, or Lloyd's "energetic digitalis" in appropriate doses) is injected at the beginning of the treatment, and repeated thereafter every third hour (or less frequently) so long as may be necessary to maintain the interval of ten points between diastolic pressure and respiration frequency, or to keep the curve of the former above sixty irrespective of the respiration. The fact that digitalis effects are slow to appear must be kept in mind, especially when oral instead of hypodermic administration is necessary; also that the dose by mouth is doubled.

That digitalis has the effect stated—that is to say, that its influence in the acute pneumonias may be measured by the diastolic pressure curve and by the relation between this and the respiration curve, is proved by a large number of clinical charts of which many have been exhibited at various medical meetings, as well as in my clinical lectures at Jefferson College, and some have been published. That digitalis may likewise exert some influence upon the systolic pressure curve, I am not prepared to deny; and, if so, that is an additional argument in favor of its systematic use. Also it reduces, to some extent, pulse frequency. But comparison of the charts of cases in which it has been used freely and those in which it has been omitted or not used with the some freedom, have convinced me that the diastolic curve is the best *guide* that we have to its helpful use in pneumonia.

ALKALINE SALINE BEVERAGE OR INFUSION.

Three things are sought by the free administration of the alkaline saline beverage:

A large supply of water to promote elimination; the maintenance of a superalkalinity of the body fluids; a supply of chlorides for such purposes as necessary in the chemistry of disease and recovery.

Capsules or papers containing a mixture of powdered sodium phosphate (five grains), sodium chloride (ten grains), and sodium bicarbonate (twenty grains), are kept in the ward and a glass of water (eight fluid ounces) in which such powder is dissolved, is given to the patient to drink, hourly, during waking hours—that is, from about 6 a. m. to about 9 p. m. (After 9 p. m. the patient is never disturbed, except to meet an emergency.). If too salty or too soda-y to be taken willingly, the quantity or the proportion of the ingredients can be changed to meet the patient's taste, or the powder may be given in a couple of capsules, washed down by plain water, or lemon juice may be added to produce effervescence and palatability.

When sufficient fluid cannot be given by any of these methods, or in the presence of active delirium, a small saline or alkaline saline infusion (250 mils or less) is administered subcutaneously, once or twice daily. If necessary, the alkaline constituent is given in capsule by mouth.

F. P. Henry, who introduced saline hypodermoclysis in pneumonia, still uses it routinely in every case, from the beginning. When practicable and expedient, that is a good method. Henry gives 500 to 1,000 mils of 0.85 per cent. sodium chloride solution, once or twice daily. The "Murphy drip" may be used instead. In place of the alkaline saline powder

mentioned, one may use with good results Quimby's capsule of sodium chloride (five grains), ammonium chloride (ten grains), and calcium chloride (one grain). With this, if needed, sodium citrate may be given, or the ordinary solution of sodium or potassium citrate used. In fine, so long as chlorides are supplied and the urine kept continuously alkaline, with an excretion of not less than 2,000 and if possible 3,000 mls daily, the special measures to be employed are merely matters of custom, convenience and expediency.

Pulmonary edema: Blood letting.—If, however, dilatation of the right heart with actual or threatened pulmonary edema be present, care and judgment are necessary in the administration of liquids, which cannot be given as freely as under other conditions. Atropine and hydragogue cathartics may be used, but, as a rule, venesection or venoaspiration is necessary; following which (and after the disappearance of the moist râles of edema) proctoclysis, hypodermoclysis, venoclysis, or the giving of water by the mouth may be resumed, with due caution.

In the streptococcal bronchopneumonia and pleuropneumonia recently so prevalent in the camps, pulmonary edema seems to be the great danger. Quinine is not of much service against the streptococcus or its toxemia, and a specific treatment of bacterins or serum, or both combined, seems to offer the best hope.

GENERAL RESULTS.

The definite treatment gives excellent results in Type II and ordinary Type IV infections, results not so good, but, at least, as good as any other method, in Type III and virulent Type IV, and results almost, but not quite, equal to serum in Type I infections.

Under good and fairly good conditions—as in Jefferson Hospital, the Jewish Hospital, and ordinary private practice—its mortality over a long series of years and including all types of infection is in the neighborhood of eight to ten per cent.

This does not apply to the Philadelphia General Hospital or any institution where a large number of the patients are pathological museums, alcoholics, aged derelicts of poverty and vice. Here anything under fifty per cent. is good, and we have a mortality of about thirty per cent. in unselected cases, and sixteen to nineteen per cent. in selected ones. In most of the fatal cases the death is not to be attributed directly to the pneumonia—the lung fever—but to delirium tremens with pneumonia as an incident, or to the chronic degenerations of tissues (arteriosclerosis, myocarditis, cirrhosis of liver, chronic nephritis, etc.) with pneumonia as a terminal infection, or—in some instances, weeks after the completion of resolution—in consequence of the general depression superinduced by the infection. In such cases statistics are of little value.

The treatment of an individual patient, however, is not a matter of strictly controlled experiment to determine certain scientific facts; neither is it a matter of percentages. "Those who die," says Jacobi, "die 100 per cent."

A combination of bacterin, serum—so far as available—and the measures of the definite treatment applied with individualizing discretion, would probably be better than any of these methods alone.

In warfare, no sane general restricts himself to infantry, artillery or cavalry, or to a particular type of cannon. Each arm, each force, is employed where it can do most good—and if the first choice is not at hand, another is used. Should a sane physician then restrict himself to a single class or type of therapeutic agents in his battle with the Goths and Huns of the microscopic world?

1545 WALNUT STREET.

SELF TREATMENT.

By E. E. SMITH, PH. D., M. D.,
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Physicians meet the idea of self medication as an incompetent procedure based on an assumption of diagnostic ability and therapeutic knowledge which does not exist. They are correct in the main; but since a certain number of intelligent individuals outside the medical profession and the practice of a much larger number lend support to a measure of self treatment, the subject is worth consideration.

At birth, the individual, while not altogether helpless, practically is so. It clings and suckles and expresses hunger and pain, usually by crying, but in most other respects exercises little or no volition. It must be ministered to by its fellow beings. With the passing of time, however, there is not only a growth of body but a mental awakening. Perception extends further into the environment and is fixed on greater details. Concepts, at first simple, become more and more complicated and the individual passes out of babyhood into childhood, through adolescence, and finally into adult life. With all this, the being has become less and less dependent on the immediate ministrations of his fellows. He has developed by reason of growth and education, the latter both from experiences of his own and from those of his fellow beings. So far as his person is concerned, he now is capable of a certain amount of self care. He rises, washes himself, and in dressing selects such raiment as is within his means, and as his judgment indicates. He selects his food both as to kind and quantity; elects and controls his habits of life and, what is of particular interest, tends to various body functions without legal or moral restraint, all, of course, within the customs of society. We do not question the right of an individual to do all of these things; indeed, we regard a person incapable of exercising such self care as lacking in personal responsibility. The individual learns from education or experience that certain foods interfere with or pervert the digestive functions, while the lack or insufficiency of certain others lead to irregularity of the bowel functions. Consequently, he avoids such interfering foods and partakes more freely of such other foods as promote regular evacuation of the bowels action. Such doings do not bring into question the good judgment of the individual, they are an intelligent part of his self care.

An occasion arises when the individual finds himself presenting what seems to be a mild degree of abnormality. Perhaps he has eaten injudiciously,

*Read at the meeting of the Society of Medical Jurisprudence, New York, March 11, 1918.

particularly as to amount, and believes from experience that he will arise in the morning to find abdominal distention and lack of the usual mental vigor. He believes that this condition will be corrected by taking, on retiring, an afterdinner pill, which is a part of the household equipment. Is he justified in doing this, as a part of his self care, or does his self interest and that of the public demand that he first consult a physician? In order to make the example more general, let me take as illustration the case of a boy who has eaten too much at a holiday dinner twenty-four hours previously and who already exhibits distention and abdominal flatulence. Is his mother justified in administering to him castor oil or other laxative from the household remedies without calling in a doctor? In other words, does parental or self care justify in any measure self treatment? If so, what are its limitations and dangers? Unquestionably, the ideal procedure is to consult the physician for the slightest abnormality, and to base all treatment upon his advice. He is especially qualified to appreciate the significance of symptoms and to recognize that in what seem to be trivial manifestations lurk serious underlying conditions. In practice, however, a certain amount of chance is taken by nearly everybody and self treatment practised at least to some extent. The reasons for this are: convenience; expense; and ignorance.

To most people it would seem an unnecessary hardship to consult a doctor for a simple cold, slight indigestion, or delayed bowel movement, when familiar remedies for these conditions are at hand and the individual is accustomed to their use. Many physicians foster this attitude by their seeming indifference to minor ailments. As physicians, knowing the possibilities in the unusual case, we may not advocate self medication to any extent whatever, but whether or not we do, it is practised and will continue to be practised as a matter of convenience. "You have a cold coming and had better take so and so before retiring" is, has been, and will continue to be household advice, as a matter of convenience, if for no other reason.

A second and more justifiable reason for the self treatment of supposedly minor ailments is the matter of expense. Wage earners and the middle classes with modest incomes must look well to their expenditures. It may be pointed out with a good deal of justice that health is worth more than a new bonnet and that money should rather be paid to the physician than spent in vanities and excesses, but there is some justification in the other view that it should be used for necessities or saved for the future when the demand for his services is only theoretical. The mother's ministrations to the children, scores of times during the year, are too well established in home life to be entirely eliminated when the budget of the masses is being made up. Nor is the matter of expense rectified by the existence of our clinics and dispensaries, since, in the first place, these avenues of treatment do not invite patients whose ailments are trivial; again, the limited hours for such consultations and the time expended in waiting are in many instances greater burdens than the minor ailment itself; and, finally,

the great majority as a matter of self respect, so long as they have some resources, do not wish to avail themselves of aid that is intended for the actually needy. By avoiding what they regard as needless consultations they can afford to pay when there is more apparent necessity to send for the doctor.

But I particularly wish to direct attention to the third reason for self treatment, namely, ignorance. From what I have said, it must be admitted that self care includes as a practical measure a certain amount of self treatment, the extent of which within certain limits of necessity varies with the opportunity and financial ability of the individual to consult a physician.

There are two causes of ignorance. First, an almost total lack of education as to the simple conditions that may in all probability receive self medication and, further, in the simple remedies which are of daily use in the household. He knows that castor oil or salts move the bowels, but this comes mighty near being the limit of his correct therapeutic knowledge. He wants to know, but is neglected by what we may term the academic sources of information. Were such neglect entirely in the interest of the lay individual, were it strictly true that self care should not include self treatment in any measure, the public at large would come to know this and such treatment would be discouraged, certainly by the refined and educated. Yet among them we find a degree of satisfaction in their ability to minister to simple bodily needs. It is hygienic. It is a part of their self care, often leading to erroneous treatment to be sure, because of ignorance, but, such as it is, regarded as a refinement rather than a vulgarity.

A second and more potent cause for ignorance is the extensive supply of misinformation with which he is daily beset. In the absence of academic sources of information, the layman reaches out into the dark, with the result that he gropes and stumbles, gets his information from unreliable sources, and many times falls by the wayside. These sources are traditional and commercial. The superior knowledge of the elder members of the family which is handed down to the succeeding generations consists of a variable and inextricable assortment of common sense and superstition, of wisdom and folly. Add to this what is learned of particular diseases and remedies from newspapers and circulars, and you have a confusion and perversion of information which constitutes ignorance.

Fortunately, it is this most serious factor, namely, ignorance, entering into self treatment that affords some possibility of relief. We may not readily make it convenient to consult the physician for minor ailments or bring it within the financial ability of many persons to do so, but, by systematized education, individuals may be taught the correct use of simple household remedies, their limitations, and the dangers attending self treatment of symptoms and maladies which should receive the attention of the trained expert. It is a surprising thing that with all the courses of instruction given in our institutions of learning, covering law and religion, the arts and sciences, and almost every

other conceivable department of knowledge, there is no instruction given on the application of simple household remedies to minor ailments. The nearest approach to this is instruction on first aid to the injured, which in recent years has received some attention. Here, of course, the demand for information is more strikingly apparent. However, the recognition of its value is evidence of the advantage of similar information relative to those minor ailments that receive self care and the differentiation of symptoms and maladies which demand the doctor.

How and where the people shall obtain such education is not within the scope of this paper to indicate. It is hardly proper to include in the school curriculum. Rather, it should be taught as an applied science after maturity. Moreover, the subject matter should not be determined by any casual writer but by thoroughly responsible physicians, one great danger being that it would be overdone. Our medical organizations would bestow a real service on the public were they to authorize instruction in the recognition of simple maladies, giving the necessary prominence to danger signals which should direct the individual to the physician, and a list of simple home remedies with their use. If we had more education in the home there would be more intelligent self care and more prompt seeking of medical advice. It is highly probable that education will not alone make simple self treatment more efficient, but will actually diminish it as a whole by avoidance of such efforts in other than simple complaints.

The most urgent and at the same time the most difficult reform needed at the present time relates to information given to the public through commercial sources. It is urgent because of its extent, its misleading character in many instances, and the readiness with which such information is received. It is difficult to combat because in many and probably most instances it is based upon half truths; yet the over anxious sufferer and his friends credit it perhaps at even more than its face value.

Think of the traffic in so called patent medicines! Though it is wrong to assume, with some reformers, that these are worthless concoctions foisted upon a credulous public solely from mercenary motives. While doubtless this is true in particular instances, there remain a large number of patent medicines made up of ingredients of distinct and definite therapeutic value, yet the promotion of which is a detriment to the public.

Let me picture to you how some of the older patent medicines came into the market. A physician compounded a remedy for a particular disease, one which proved efficient to his way of thinking and perhaps to his patient's, so that it came to be a stock prescription with him for this particular condition. Perhaps it was a laxative, possibly a malarial tonic, or it may have been an ointment. He prescribed it so frequently that the druggist kept it on hand ready to dispense or, if the physician did his own dispensing, he carried it already compounded as a matter of convenience. Thus, Doctor X's laxative, malarial tonic, ointment, or what not, came to be known; it acquired a local reputation. Realizing this, and seeing the commercial value, possibly the

doctor himself had it put up ready for sale; or his family did it after his death, regarding the remedy with the same veneration as the memory of the departed; or, possibly it was the pharmacist who handled the matter, making it a straight out and out commercial proposition.

With its sale extension, letters came from grateful patrons who had or thought they had improved through it and who rightfully or otherwise attributed their improvement to it, and it was concluded from these letters that the pill, originally a laxative, was in fact good for rheumatism, so it now became a remedy for both constipation and rheumatism, and since rheumatism is more impressive to the laity, its value as a "rheumatism cure" as emphasized. But why limit its claims? The letters speak of diabetes, sciatica, nervous debility, neuralgia, sleeplessness, loss of power, St. Vitus's dance, liver troubles, female complaints, partial paralysis, locomotor ataxia, and indeed many other diseases, so, as time passes and the business extends, these complaints are included and widely advertised in the list of diseases for which Doctor X's laxative is a cure. Moreover, the letters are carefully filed and can be produced at any time to justify the claims, if any doubting Thomas takes the trouble to investigate.

Poor Doctor X and his laxative pill! Were he to return to earth he no longer would recognize his own. Where he sowed wheat, tares have sprung, and, what was originally a messenger of mercy, has lost its mission in the multitude of unjustified claims that are now the basis of its existence. Whom shall we blame for this? Shall we point to the proprietors of these remedies and characterize them as fakers and thieves, or, even worse, barterers in human life? Let us be fair; they are respected neighbors; they are fathers and brothers who are, as they in many instances believe, rendering a service to the community in the rôle of the poor man's doctor.

The ignorance, the incompetence is obvious. A layman or a lay corporation is practising medicine without having qualified to do so. Medicines are being advocated by technically ignorant proprietors for the treatment of an equally ignorant public. The correction of this situation is being attempted at the present time chiefly by criminal prosecution, yet the evil goes on without direct protestation or attempt at correction till it has become an established business and has already exercised its unfortunate influence on thousands and probably hundreds of thousands of anxious sufferers, until finally the proprietors are brought within the pale of the law and the case placed in the hands of a public prosecutor for trial proceedings.

Now arises another extreme, almost if not quite as reprehensible, though fortunately not as far reaching, as the evil which it attempts to correct. The remedy, which indeed still possesses the merits which originally brought it into existence, is now shorn by the prosecutor entirely or practically so of any merits whatsoever, physicians testifying, because of their disapproval of the patent medicine evil, to the practically worthless character of the remedy in question, even though they may be using substantially the same drugs in their own practice. Moreover, the defendant is hampered in obtaining

evidence of the real merit, little or much, which the remedy possesses because reputable physicians, who testify to such facts, are accused of possessing low ideals and venal motives, such characterization being based upon the assumption that their testimony tends to exonerate a guilty defendant. In point of fact it may be quite the opposite. When, as happens, the court states that the evidence of claims is not substantiated by physicians put on the stand by the defence, the only interpretation of such testimony, justified by the facts, is that it has been helpful to the court in arriving at a verdict of guilty, even though it was from the mouths of the defendant's witnesses; and to vilify such witnesses is not only unfair but wholly unwarranted. Conviction of crime is only just when judge and jury have before them all the truths that can be said in behalf of the defendant. To denounce witnesses for a guilty defendant as in any way contributing to or supporting the crime is to ignore the protection in law which is fundamental to the establishment of guilt and which must underlie all righteous punishment for crime. It is employment of unjustifiable methods, even though it be to accomplish a justifiable end. As a matter of fact, it is evidence of prejudice and weakness and of a failure to appreciate the demands of justice.

The whole question of eradicating the patent medicine evil calls for remedies quite apart from prosecutions after the fact. It calls for education, not alone of the credulous public but of patent medicine proprietors, most of whom are responsible citizens conducting their business from a wrong point of view. Here is a field for action which reformers may well cultivate. No patent medicine should appear on the market without a systematized effort on the part of those technically educated to inform the proprietors of its possibilities of evil and the extreme caution necessary in its exploitation, if indeed, its sale should not be wholly discontinued. Such a method may not make heroes of reformers, but it will render a greater service in promoting the public good. Reputable proprietors will adjust their course of action to their view of what is right. They need to be educated as to the facts in the case and this should be done before their appreciation of the matter is perverted by the financial sacrifice asked in the relinquishment of an established industry.

It would appear that self care is a part of personal responsibility; and that as a practical consideration, this, with the majority of people, induces the self treatment of simple minor ailments, convenience and expense preventing the going to a doctor for every complaint. For the intelligent conduct of such simple self treatment, and to avoid self treatment of ailments that are or may become at all serious, education which is not at present available through academic channels is suggested. One has only to spend a short time in the average drug store to see what reliance is placed by the public upon the advice of the drug clerk or his apprentice. "Something for a cough," for indigestion, for constipation, for a cold in the head, for rheumatism, for sore throat, for sore muscles, for weak eyes, for headache, for gas in the stomach, for falling hair, for a tired feeling, for nervousness, for poor blood, for the grippé, something for these and numerous other

complaints is frequently asked for and received over the drug counter without any instruction that cough may mean tuberculosis, indigestion gastric ulcer or cancer, and rheumatism one of a large number of conditions such as foci of infection or an intestinal toxemia to be removed. Sore throat may indicate diphtheria or syphilis, weak eyes weak muscles, or any number of pathological conditions of the eyes, the common headache may mean scores of things calling not only for different treatment but, in some instances, for directly opposite medication; poor blood may or may not mean anemia, nervousness calls more for the regulation of habits of life than for drugs, that in fact any medicine used for any complaint may be and usually is but a minor phase of the treatment needed.

It would have the further advantage of demanding intelligent service from the physician. I do not wish to intimate that physicians are ever negligent in the examination of their patients or that they fail to take a rational survey of the patient's condition before prescribing for him. In general, it is expected that education would add to the intelligence with which the patient could cooperate with the physician in describing symptoms and observing effects. It would do more than this. It would extend its influence into the affairs of life. It would give a more just appreciation to the employer of illnesses of his employees, enabling him to form a better judgment whether such illness were genuine or malingering. This applies equally to the employer in the factory, office, store, or home.

In opposition to education in simple self treatment there is, foremost, the danger that it will be overdone—carried too far. Another objection is that it leaves out of consideration the factor of therapeutic suggestion. It is not to be questioned that suggestive therapeutics is in suitable cases a valuable adjunct to the materia medica, in some instances being capable even of replacing it altogether. Yet this does not justify the therapeutic nihilism which is the basis of certain cults. While it is true that suggestive treatment is a valuable feature of the physician's attendance on a case, it must be emphasized that the simple treatment of self care should not apply to complaints of such seriousness as demand suggestive therapeutics.

50 EAST FORTY-FIRST STREET.

Study of Acute Mercuric Chloride Intoxications in Dog, and Kidney Injury.—William DeB. MacNider (*Journal of Experimental Medicine*, April, 1918) induced acute mercuric chloride intoxication in dogs, which he divides into four groups, according to their reaction to the poison. The first group died as a result of the shock associated with a severe mercury enteritis. The other groups withstood the corrosive action of the poison for varying lengths of time, but they died from a delayed intoxication. Examination of the kidneys of this last group showed a severe type of injury, with acute swelling and necrosis of the renal epithelium. MacNider believes the delayed kidney injury is not due to the action of the mercury as such during its elimination by that organ, and he is now studying the manner in which the mercuric chloride induces an acid intoxication.

THE TREATMENT OF THE FEEBLE-MINDED.*

BY WILLIAM BURGESS CORNELL, M. D.,

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The great impetus and interest in this particular work is of very recent origin and followed the introduction into the United States of the Binet scale only a few years ago. There has resulted a popularization of knowledge concerning the feeble-minded comparable probably only to the tuberculosis propaganda. We have been informed that a certain percentage, estimated from two to four per thousand, were feeble-minded, that the presence of these mentally deficient individuals in society constituted a great menace, that they produced the criminals, recidivists, sexual offenders and the antisocial in general, and that they, if given the opportunity, prolifically reproduced feeble-minded according to the Mendelian law of heredity; therefore, all the feeble-minded should be segregated in institutions or otherwise protected so that all of the above might be prevented. Such statements spread broadcast chiefly by nonmedical psychologists and propagandists have been taken up by numerous groups of faddists and further disseminated.

Let us see how the three to 1,000 ratio has been obtained. The early work in this country was done at the Training School at Vineland, N. J., by H. H. Goddard, who subsequently tested a large group of New Jersey school children. Subsequent surveys have been made elsewhere, notably in Porter County, Indiana, Nassau County, New York, and New Castle County, Delaware. The agencies active in this work in addition to the Vineland institution being the Committee on Provision for Feeble-minded (Philadelphia), the National Committee for Mental Hygiene (New York) and the United States Public Health Service. In addition, there have been many smaller surveys and studies carried out in school districts, prisons, reformatories and other institutions. The actual mental testing has been done chiefly with the Goddard Revision of the Binet-Simon Scale, and the Terman or Yerkes-Bridges modifications, combined in some instances with certain performance tests. As might be expected, the statistics obtained have everywhere shown a fair degree of uniformity. The immediate result of the statistics and the propaganda based on it has so far resolved itself into an agitation to obtain more housing and more institutions, it being pointed out to legislators and other public officials, taking the State of New York for example, and using the three to 1,000 ratio, that there are 35,000 feeble-minded in the community and only 5,000 institutional beds to care for them. Hence a frightful lack of accommodations is alleged and a resulting public menace stated to exist.

The particular good that has come out of it all has been to call public attention to the group of defectives and inferior mentality as a whole. Lay interests have brought the subject before the medical profession, particularly the psychiatrists, and thus

through a process of *vis a tergo* the latter have at last taken up a work that is particularly their own.

But beyond marking off a certain proportion of the population and agitating the need of institutions to house them, very little else has been done. The movement has not concerned itself much with the planning and organization of the institutions, and treatment is hardly mentioned. We find today practically all the institutions for the feeble-minded hardly more than custodial asylums with more or less provision for industrial occupations of its inmates. In a few, the training and educational side of the work is well developed, but in none, as far as I have been able to discover, is the medical work organized on the plane of the best psychiatric hospitals to which they should be comparable. A comparison of the size of the resident staffs of the New York State hospitals for the insane with those for the feeble-minded demonstrates this point; in the former, the ratio of physicians to patients is one to 170, in the latter one to 400. Three of the four institutions have but one physician in addition to the superintendent, and sometimes the latter performs his manifold duties alone. But all this fits in with the earlier, nonmedical idea of feeble-mindedness in which it was simply a case of testing with the Binet scale, and, if the patient fell between the eight and twelve year level, he was called a moron, three and eight an imbecile, and three and below an idiot, and institutional care, for life usually, prescribed. With all due credit to the Binet scale, and a great deal is due, we are coming to realize that it forms only one of the parts of the necessary psychiatric examination. We now know that we have not gone into the matter enough if we only can say "Mentally aged seven, institutional case." Too much reliance has been placed upon the Binet findings and too many deductions made therefrom. We see that a variety of conditions may give rise to a low intelligence test, and we begin to question the wholesale adoption of the ratio to large population groups. Hence, an inclination to doubt the broad statement that there are 35,000 feeble-minded in New York in need of special or institutional care on the ground that we are not dealing with a pathological entity or a uniform group, and there is no proof that they need institutional care or are even feeble-minded.

So far then we have heard nothing except the mechanics of feeble-mindedness. Test after test has been elaborated, and numbers of scales devised until we have almost come to believe the whole matter is simply determined by psychological laboratory reactions and finding the intelligence quotient. We have had enough of this; more of the human or individual is what is needed. Healy, as admirably expressed in his "*Individual Delinquent*," has pointed the way, and this work, I am sure, will stand as a pioneer in the use of the proper method of inquiry, examination and treatment of the mentally subnormal.

Since the reorganization of the New York City Children's Hospital and School, which began in 1915, only the feeble-minded or those suspected of being so and those supposed to be epileptic have been admitted. It is surprising how great a variety the cases present. Most of the new patients are first met

*Read at a meeting of the Medical Association of the Greater City of New York, October 15, 1917.

in the Mental Clinic at Randall's Island or at Cumberland Street Hospital. There the history is assembled and preliminary tests made. If found suitable, as soon as a vacancy occurs, the patient is admitted to the Randall's Island institution and is put in the reception ward, where he remains about two weeks; during this time, a study is made of the mental reactions and trends, further psychological testing is done and in addition Wassermann and Schick tests, antityphoid vaccination, throat culture, and in females a smear is examined for the gonococcus, besides the routine physical survey in all cases. All grades of mentality are met with from the idiot group to those whose intelligence is normal. Various phases of conduct difficulties and disorders are combined with different intelligence grades. We see syphilis acquired and hereditary, retardations due to home environment or to physical disease, juvenile psychoses, deteriorations, and enfeeblements secondary to organic diseases of the nervous system, retardations secondary to endocrine disturbances, in addition to the so called primary amentias, not to omit the multitudinous conditions associated with the epileptic syndrome.

It is easily seen that it would be a mistake to class such widely divergent cases simply as feeble-minded, even though they might test out as such, and it is equally evident what large opportunities for clinical medicine and therapeutics are presented. The actual therapy calls for an equally wide range of remedial measures, the most important of which are anti-syphilitic medication, treatment with internal glandular substances, surgical procedures, and general hygienic and upbuilding methods.

But the treatment of the feeble-minded is by no means entirely medical. We are often dealing with a combined medical, pedagogic, and sociologic problem. Treat, train, and socially readjust forms the therapeutic triad. We must not forget that society is made up of many mental levels and that there are many useful and very necessary citizens performing indispensable work (which we sometimes condescend to call humble) because they happen to have a simpler or lower grade mind.

The training is quite obviously a very important part of treatment. Something useful as an industry or a trade is taught, suiting as closely as possible the work to the mental aptitudes. Very little time is spent on scholastic work (in some institutions much is wasted) and even then the concrete has everywhere replaced the abstract.

The environment has often played a large rôle; many of our patients have never had a fair chance. Sometimes it is a wretchedly bad home, again it may be a child suffering from prolonged and monotonous institutional life. So that our case is often greatly benefited by reestablishment under a new and more propitious environment. Aftercare supervision or supervised colony life are methods of treating certain cases.

Visitors often ask us what percentage of cases are cured. We have been forced to admit that we never thought of our patients in that light. Nor have any of the other similar institutions done so, as far as I know. But I believe the time has arrived when we should classify our cases under such headings as cured, much improved, improved or unimproved.

This would at once prove a stimulus to achieve the best possible results and express as well what service the institution renders the community. I am convinced, for instance, that the Randall's Island Hospital and School has done a great amount of good in the aggregate, but it is difficult or impossible to show this; it would be possible, however, if some such method of recording results were followed.

We are emerging from a mass of bad statistics, false premises, and popular hysteria concerning the feeble-minded into more rational considerations, treatment, and disposition. It is up to the medical profession and those responsible for the management and policies of public institutions to carry and perpetuate this very fundamental and important work.

ACUTE INFECTIOUS JAUNDICE (SPIROCHETOSIS ICTERO- HEMORRHAGICA).*

BY CHARLES HERRMAN, M. D.,

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The history of acute infectious jaundice is exceedingly interesting. It was probably recognized by Hippocrates. The characteristic changes in the appearance of the eyes, urine, and feces would of course immediately attract attention. The disease is mentioned by writers in the seventeenth century; but the first detailed description of epidemics is found in the writings of the end of the eighteenth and the beginning of the nineteenth century. In 1879, Froehlich (1) was able to collect the records of thirty epidemics, and added a report of four small epidemics, which occurred in the German army between 1875 and 1878. Of the earlier reports that of Woodward (2) is particularly interesting at the present time. His descriptions of the chief diseases which occurred in the United States armies, during the civil war, contain many suggestions, which could be applied with profit in the present crisis. It will be remembered that his *Medical and Surgical History of the War of the Rebellion* was enthusiastically praised by Virchow (3). Among the Federal troops in the civil war 22,569 cases of acute infectious jaundice were reported, with 161 deaths. The modern conception as to the manner in which the communicable diseases were spread was unknown. Although Budd (4), in 1859, had clearly indicated the way in which typhoid fever was spread, his views as to its communicability were not generally accepted. The difference in the degree of communicability was not recognized, for it was said, for example, that measles spread rapidly and infected nearly all those that had not had the disease. The importance of mild or "missed cases," and of carriers, was not recognized and appreciated. The injurious effect of crowding, so called "crowd poisoning," was supposed to be due to the emanations and exhalations from the skin and lungs. The important rôle of contact infection through the discharges of the nose and throat was not considered. Miasms, emanations from putrefactive material, and defective

*Read before the Medical Association of the Greater City of New York, February 18, 1918.

drainage were the prime causes of infection. Of course this was all twenty years before the investigations on the typhoid bacillus and the malarial plasmodium. In discussing the etiology of acute infectious jaundice, these same factors, defective drainage and putrefaction, are mentioned, even by recent writers, and very little is said of the possibility of contact infection. It is not at all surprising that this disease should occur in camps, as the two essential factors, crowding and the presence of a certain number of susceptible individuals, is present. Acute infectious jaundice is not essentially a disease of adults or of camps. Measles is primarily a disease of childhood and of civil life in urban centres, but it occurs in camps, when large numbers of adults from rural districts are brought together. These individuals, many of whom have not had the disease in childhood, are brought in close contact, and being susceptible, contract the disease. There is, however, a marked difference between measles and infectious jaundice, as only a small percentage of persons exposed to the latter contract the disease.

Since Froehlich's paper was published in 1879, a number of authors have reported small or large epidemics (5-12). In 1886 Weil (5) reported four cases of a more severe type, associated with an enlargement of the spleen and albumin in the urine, and since then the severer type of this disease has been called by his name.

In a chart I represented graphically the seasonal incidence of a series of my own cases, and of a series reported by Flesch (10). In another the seasonal incidence of so called catarrhal jaundice as it occurred in the city of Berlin from 1892 to 1897 is represented. The figures were compiled by Neumann (8) from the records of the larger hospitals and dispensaries of that city. It shows the periodical increase of cases in the late fall and winter months. It also shows the greater prevalence of the disease among children.

In urban centres infectious and so called catarrhal jaundice agree, in that they are prevalent during the late fall and winter months, and in that they affect primarily children under ten years of age. In large cities, the disease occurs sporadically as well as epidemically. Clinically the cases of so called catarrhal jaundice differ in no essential respect from those of the infectious type, or Weil's disease. In the same epidemic all grades of severity are met with. Such marked differences are not uncommon in other diseases. For example, in the epidemic of poliomyelitis which occurred in New York city, in 1916, it was not rare to see, even in the same family, one child with a mild nonparalytic attack and another with the malignant bulbar type. This same variation is seen in the epidemics of spirochetosis icterohemorrhagica, as described by Japanese and by European writers. Here the microorganism has been definitely determined and is the same, and still the Japanese investigators give a mortality as high as thirty-two per cent., while the English give from four to five per cent. The virulence of the infectious material is apparently increased by its passage through man and animals.

Indiscretions in diet have always been supposed to play an important part in the etiology of so called catarrhal jaundice, but the evidence is not at all con-

vincing. There are many facts which speak against such an assumption. In the majority of my own cases there was no definite history of such an indiscretion, and although *all* the members of the family usually partook of the same food, only one or at most two children were affected. When several members of the same family were affected they were not taken sick at the same time, but after an interval of two or three weeks. A number of cases were entirely free from any symptoms of digestive disturbance. Infants under one year are rarely attacked, although gastrointestinal disturbances are especially common at that age. This seems to be due to a relative immunity, similar to that enjoyed to some of the other communicable diseases. Catarrhal or infectious jaundice is not common during the summer months when digestive disturbances are frequent. The children affected with jaundice are not those who have been subject to digestive disturbance. One attack of infectious jaundice renders the patient immune to further attacks. In the history of these patients there is no evidence of previous attacks. It need not be mentioned that the initial vomiting is not necessarily an indication of primary disease of the stomach. I do not deny that jaundice may not in an exceptional case be caused by the eating of impure food, but such cases I believe are exceedingly rare. The water supply has also been held responsible for some epidemics, but in New York city the water supply is unusually good, and if it were responsible we should expect the disease to be far more widespread. There is no evidence to show that the milk supply is a cause. The fact that young infants rarely contract the disease would point strongly against such an assumption.

In 1913 I reported (13) a series of ninety-eight cases of infectious jaundice which I had observed from 1907 to 1913. Of these twenty-five occurred in October, November, December, 1912, and in January, 1913. At that time, I emphasized the following points. The periodical appearance of a large number of cases at a certain season of the year indicates that we are dealing with an acute infectious disease. Sporadic cases may occur at any time. The disease presents itself in all grades of severity from the mildest with very slight constitutional disturbance, the marked cases, so called Weil's disease, with severe symptoms, and the fatal cases. The infectious material apparently has a special affinity for the biliary passages, in the same sense that the typhoid bacillus has for the follicular structures of the intestines. Indiscretions in diet play no part in etiology; it is not even certain that the infectious material enters the body through the gastrointestinal tract. After the initial stage has passed, the appetite may be very good. The seasonal incidence and the frequent presence of catarrhal symptoms, in the upper respiratory tract, would point to the nasopharynx as a possible portal of entry of the infectious material. It is well known that certain microorganisms have a selective action on certain tissues, and the site of the lesion may be far removed from the portal of entry.

In November, 1917, I began to see a number of cases, so that up to the middle of January, 1918, I had an opportunity of observing twenty-four cases, all but one in children, and all but one in the

Borough of the Bronx. In one family, six of nine children were affected; in another family, the mother and two children, and in two other families, occupying adjoining apartments, two children each. It is therefore probable that the disease is slightly communicable, either by direct contact through the nasopharyngeal discharges or indirectly through infection with the urine or feces of the patient. In three of my cases there was pharyngitis with a tonsillar exudate, and in several rhinitis. The incubation period seems to vary from one to three weeks, but as infection may possibly take place at a late stage of the disease through infected urine or feces, the exact time of infection is difficult to determine. In this series of cases the disease followed the usual course. It began rather suddenly with headache, drowsiness, and lassitude. This was followed by a rise of temperature. In some there was vomiting at the outset. After three or four days the conjunctiva became yellow, the urine dark, and the stools light in color. Examination of the patient showed an enlarged liver, in some also an enlarged spleen, pain in the epigastrium, and in some pain in the legs; in a few cases epistaxis. Occasionally a trace of albumin was found in the urine. Usually in about two weeks, the urine and stools regained their normal color, but the pigmentation of the conjunctiva and the enlargement of the liver persisted for a somewhat longer time. In a few cases after an afebrile interval of about ten days there was another rise of temperature which lasted a few days.

In the latter part of 1914, and the beginning of 1915, several Japanese investigators (14), during epidemics which occurred in various parts of Japan, succeeded in finding a specific spirochete, which was present in acute infectious jaundice. These findings were later corroborated by German, French, and English investigators (15-24). To this disease the Japanese experimentors gave the name *Spirochetosis ictero hemorrhagica*. Although this name well describes the principal features in the typical cases there are some without icterus, and some without hemorrhage. The specific spirochete is pleomorphic; it is from one half to the whole diameter of a red blood corpuscle in length. The ends are pointed; and only one end may be curved, so that the shape resembles a question mark; or both ends may be curved in the same direction to form a C, or in opposite directions, to form an S; there may be several regular or irregular undulations. The spirochete is found in the circulating blood, only during the first few days of the disease, and then only with the greatest difficulty. However, if the blood, taken in the early stage, is injected intraperitoneally into guineapigs, they develop the characteristic symptoms of the disease in from four to five days, and die a few days later. The spirochetes can be recovered from the blood, and from the liver, also in smaller number from the kidneys and suprarenal capsules. A few may be found in the spleen, bone marrow, and lymph nodes. In patients with acute infectious jaundice of this type, the spirochetes may be found in the urine during the third week, also in the stools, and occasionally in the sputum. Intraperitoneal inoculation into guineapigs of the sediment obtained from centrifuged urine, produces the characteristic

symptoms in these animals. In patients, and in inoculated animals, the serum after the second week, contains immunizing substances. If this convalescent or immunizing serum is injected into guineapigs which have been inoculated, before the appearance of the jaundice, the disease does not develop, and the spirochetes disappear from the blood shortly after the introduction of the serum. Recently (14) the Japanese investigators have found that the intravenous is far more effective than the subcutaneous administration of the immunizing serum. It must be given early in the disease, that is, not later than the fifth day. Sixty c. c. are given in the course of twenty-four hours. The organisms quickly disappear from the blood and tissues, but remain in the kidneys. By the use of the serum the mortality has been somewhat reduced; there is a favorable effect on the hemorrhagic tendency, and the duration of the jaundice is shortened.

As stated, in the epidemics of acute infectious jaundice as we see them in New York City, the cases vary greatly in severity. The vast majority are mild, but the severe cases, the so called Weil's disease, with enlargement of the spleen and albumin in the urine also occur, hemorrhage more especially epistaxis is frequently observed, and even death may result. Except in the degree of severity of the majority of the cases, the disease as we see it, differs in no way clinically from the disease as described by Japanese, and European authors. Even in the foreign epidemics, as has been mentioned, there is a great difference in the severity. For this reason it is possible that the disease as we see it, represents a mild form of the same disease, which bears the same relation to *Spirochetosis icterohemorrhagica*, that the so called Brill's disease does to typhus fever; or it may represent one of a group of diseases, and may bear a relation similar to that which paratyphoid does to typhoid fever. Recently Fiessinger and Leroy (25) have reported two cases of afebrile jaundice, in which they were able to isolate from the urine, a spirochete which was non-pathogenic for guineapigs, so that it is possible that there are different strains of this organism. The absolute proof of this relation will of course depend upon the finding of the specific spirochete in our cases. This spirochete has been found by the Japanese investigators in the wild rats of the district in which the disease occurred. In this country Noguchi (26) and recently Jobling and Eggstein (27) have found this spirochete in the wild rats of New York City and of Nashville, so that the possibility of infection is present. Doctor Noguchi who has been greatly interested in the subject, has kindly examined a number of specimens of blood, urine, and feces taken from some of my patients, and has consented to make a brief report.

CONCLUSIONS.

So called catarrhal jaundice, epidemic jaundice, and infectious jaundice, Weil's disease or *Spirochetosis icterohemorrhagica*, probably represent a closely related group.

Clinically these are similar. The difference is solely in the degree of severity of the majority of the cases in each group. Mild, moderate, and severe or fatal cases are met with in each group.

The infectious material probably enters the body through the nasopharynx, is then taken up in the circulating blood, and has a selective affinity for the bile ducts of the liver. It is probably a primary infection of the liver, not an ascending infection from the duodenum. The disease is not due to indiscretions in diet, and there is no conclusive evidence that the infectious material is conveyed by food or water.

One type of infectious jaundice, Weil's disease or Spirochetosis icterohemorrhagica, has been shown to be due to a specific spirochete. It is not unlikely that sporadic and epidemic jaundice of the so called catarrhal type, are due to a related organism.

The infection probably usually takes place by direct contact. However it is not unlikely that occasionally infection may occur indirectly, through infected urine or fecal matter.

The disease is only slightly communicable, for apparently most individuals enjoy a natural immunity. One attack renders the patient immune to future attacks.

In civil life, sporadic and epidemic jaundice is somewhat more common in children, probably because they are more susceptible and have not been immunized by a previous attack. In camps the disease is most common among recruits who come from rural districts, because a certain number of nonimmune or susceptible individuals are brought into close contact.

ANTITOXIN DOSE IN DIPHTHERIA

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In the treatment of diphtheria two facts are to be considered: first, it is a local infection attacking the nose or throat, and second, which is more important, that this infection beginning as a local one, becomes generalized and spreads through the entire body by the blood and lymphatics, resulting in a generalized toxemia. Hence the treatment is aimed chiefly to overcome this toxicity, spread through the entire body, and it is now a recognized fact that antitoxin must be used.

The possibility of anaphylaxis must not be forgotten and the likelihood of some slight harm from the antitoxin must be remembered; yet the evidence of harmful results from its use is so scarce as to be almost negligible, and the number of cases of anaphylaxis so few, as scarcely to be considered; while on the other hand, the positively curative results from the use of antitoxin are universal. Now, regarding the large dose of antitoxin at one single initial injection: it is our opinion that the quicker and more prompt the injection, the greater the chances for recovery; and I believe a large initial dose should be given as quickly as possible. Time and large dose are the two most important and effective factors for recovery, and my belief is grounded on satisfactory results based on experience and careful statistics. My chief reason for believing is this: after eight to twelve hours' time, while the lesion is still chiefly a localized one in the nose or throat, the toxins from the bacteria have spread through the entire system, and the infection has become generalized. I believe the damage is done by the liberating of the toxins which have passed all over the body from eight to twelve hours before the antitoxin is given; hence a sufficiently large dose should be given not only to prevent further intoxication from the bacteria but to overcome what toxins are already in the system. You will find if this rule is followed that later smaller doses are rarely required, because the large initial dose, promptly given, accomplishes all that is desired; namely, the disappearance or absorption of the membrane and the disappearance of the toxic condition.

You will then probably ask: What is the rule for the dose of antitoxin in diphtheria? I answer: No definite dose can be stated, and no definite positive hard and fast rule can be given to cover all cases. However, some of the factors influencing the amount of antitoxin to be given are the following:

The age of the patient: the older the patient, the larger will be the dose given. Duration of the illness: if sick only one or two days, the amount would be less than if sick six or seven; based of course on the greater time for spread through the entire system of the toxin products. The length of time elapsing before the exudate appears, as evidencing the virulence of the organism. The degree of extension of the membrane or exudate; the less extensive requiring less amounts than where the exudate extends over the tonsils, pillars, fauces, and

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Syphilis of the Stomach.—Louis René Kaufman (*International Journal of Surgery*, April, 1918) gives as the treatment of this condition the treatment of syphilis in general—salvarsan, mercury, and potassium iodide. The lesions are hard to reach and treatment must be persisted in. Relief from gastric symptoms is brought about rather quickly in specific cases. Surgical treatment may be necessary, gastroenterostomy being the operation of choice.

uvula. The density and thickness of the exudate: thin filmy kinds needing smaller amounts of antitoxin. Depending on the type of cases: the laryngeal types require larger doses than either the tonsillar, faucial, or nasal ones. Nasal types require next to the laryngeal types, and tonsillar need the smallest ones of all types. Toxicity of the patient: very toxic cases often require mammoth doses. The general condition of the patient also influences the dose, as where there exists a weak pulse or cardiac arrhythmia or markedly enlarged cervical glands, giving the characteristic "bull neck," or labored breathing or a general weakened condition.

However, examples will best illustrate these rules:

CASE I.—Frank R., age four years, admitted on second day of disease, giving symptoms of sore throat, slight fever; exudate appeared in fifteen hours. Physical examination showed a nasal discharge, exudate on tonsils, fauces, and uvula; 28,500 units of antitoxin were given immediately upon admission.

CASE II.—Nelson L., age twelve years, admitted on second day of disease with exudate covering tonsils and fauces, which appeared in eight hours; received 25,650 units.

CASE III.—Walter D., age four years, admitted on fifth day, having membrane on both tonsils, fauces, and uvula; exudate seen in seventy-two hours; 31,500 units given.

CASE IV.—Morris F., age ten years, admitted on second day, with nasal discharge and follicular exudate; 25,600 units injected. Exudate appeared in twelve hours.

CASE V.—Francis McB., age four years, third day sick, tonsillar and nasal type; thick exudate occluded entire throat; given 31,350 units.

CASE VI.—John A., age three years, laryngeal case; received 14,250 units at once on admission.

CASE VII.—John H., age two years, admitted fifth day, with tonsillar, nasal, and faucial involvement, and had "bull neck;" 22,800 units injected.

CASE VIII.—Samuel D., age seven years, fourth day sick; thick exudate noticed in twenty-four hours on both tonsils; received 25,550 units.

CASE IX.—Horace F., age four years, third day of sickness; throat clean; nasal discharge; 14,250 units injected.

CASE X.—William L., age two years, thick tonsillar exudate; received 19,950 units.

CASE XI.—John W., age seven years, exudate covering tonsils, fauces, and uvula; lips swollen; ears and nose discharging; "bull neck;" toxic condition and delirious; injected with 39,900 units.

CASE XII.—Charles B., age three years, membrane covered tonsils; posterior pillars; uvula had a nasal discharge; given 34,200 units.

CASE XIII.—Benjamin Y., age six years, fifth day, with nasal discharge and entire throat occluded by heavy exudate, also marked "bull neck;" received 45,600 units on admission and 19,950 units the following day; total injection, 65,550 units.

CASE XIV.—Mrs. B. M., age twenty-two years, sick three days; exudate on both tonsils and fauces; received 39,900 units.

CASE XV.—Leon R., age twenty-three years, third day of illness; thick exudate filling entire throat; received 51,300 units.

CASE XVI.—Mrs. L., second day; heavy exudate on tonsils; injected with 48,450 units.

CASE XVII.—Bertha P., age twenty-five years, fifth day; thick exudate filled whole throat, had nasal discharge, "bull neck," and was very toxic; given 62,700 units.

CASE XVIII.—Mrs. B., age fifty-eight years, seventh day sick; entire throat occluded with thick exudate; breathing labored; was very toxic; heart irregular; nasal, tonsillar, and laryngeal types; given 75,000 units.

From the foregoing cases you will note that no definite single rule can be laid down for the amount of antitoxin to be used in all cases: suffice it to say that as a general rule large doses were given ranging from 15,000 to 35,000 in children, say up to

fifteen years, and from 20,000 to 40,000 or 60,000 in older ones and adults. The factors chiefly to be considered were: the duration of illness, the extent and thickness of the exudate, the type of involvement, the toxicity, general condition and age of the patient. It was preferred to give one single initial dose on admission and sufficiently large to effect the desired results, namely: absorption of the exudate and lessening of the symptoms. The best and most satisfactory results were gotten with these large single initial doses, which practice was decided upon as the result of many years of experience; and rarely was it necessary to give later smaller ones. No baneful results followed the use of these large initial doses, excepting an occasional serum rash, which shortly disappeared.

As regards the dose for immunizing purposes it ranges from 500 to 1,000 units for children, and 1,000 to 6,000 units for adults. It is usually, like the dose for curative purposes, given in one injection in the thigh at the upper outer aspect.

Besides the use of antitoxin in diphtheria, there is some medicinal treatment necessary which is aimed chiefly at elimination, or at the meeting of the complications as they arise, the chief being: cardiac arrhythmias, nephritis, rhinorrhea and otorrhea.

FLUOROSCOPY IN THE DIAGNOSIS OF CHEST CONDITIONS.

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Before Laennec's discovery of the stethoscope, chest diseases were diagnosed only by external appearances and symptoms. Laennec's "spool" which made use of the sense of *hearing* in chest diagnosis was at first ridiculed and doubted, but later became one of the most important, if not the most important feature of clinical diagnosis, and as such occupies a prominent place in the routine physical examination of the chest.

Fluoroscopy, which makes use of that most sensitive of all our senses, *sight*, is destined to go through the same probationary and formative period; after which it will be adopted by the internist, and will be incorporated as part of routine chest examinations. Fluoroscopy has been preferred to chest plates because of ease of manipulation and relative economy. It was first utilized abroad by such internists as Krause, Levy-dorn, Haude, Groedel, Holzknecht, and by them introduced in their clinics. These clinicians established fluoroscopic examination in the routine of their chest examinations. In our own country, relatively few clinicians have utilized the fluoroscope as an adjuvant in their chest observations.

Technic.—In inspecting the chest with the fluoroscope, attention should be given to: a, lung fields; b, heart and mediastinal outlines; c, excursion of the diaphragm; d, topography and action of the ribs; e, apices and lung parenchyma.

Before proceeding to interpret these shadows of pathological changes, certain facts of normal physiology must be borne in mind: In men the breathing is costal in type. In women it is abdominal and the

rib movements are restricted. In children the ribs are more horizontal and the respirations are costo-abdominal. The outline of the mammary glands in women should not be mistaken for evidence of pathological condition.

Lung fields.—The illumination of lung fields with normal or forced inspiration must be distinguished from emphysema and pneumothorax. The diminished illumination of expiration must be distinguished from that due to inflammatory infiltrations such as pneumonia, tuberculosis, abscesses of the lungs and bronchiectasis.

Heart and mediastinal outlines.—In stating the relative use of the heart outline in its relation to the lung fields it is important to distinguish the relative increased heart shadow in children from the hypertrophy, dilatation, and partial displacement or tumors.*

The position of the heart in systole, diastole, and asthenia must be distinguished from pathological variations. The cardiophrenic outline must be studied in order to appreciate the loss of this outline in pathological conditions such as pericarditis and myocarditis. The physiological outline of mediastinal glands, hilum structures, and aorta must be distinguished from tuberculosis, fibrous and sclerous changes.

Excursions of the diaphragm.—The fact that the right diaphragm is higher normally than the left (due to its relation to the liver), and that the excursion of the left diaphragm is more ample than that of the right, must be borne in mind in order to differentiate from the "splinted" diaphragm excursions of pleural involvements, the deformities due to pleural adhesions or exudates, subphrenic abscesses, diaphragmatic hernias, and paralysis, either partial or complete, of one or the other leaves of the diaphragm. As compared with fluoroscopic examination of the diaphragm, how primitive indeed is Litten's diaphragm phenomenon and how unsatisfactory its results. Especially in the diagnosis of the disease for which Litten's sign became famous—namely, subphrenic abscess.

Topography of the ribs.—The normal shadows of the arches of the ribs compared to the size of the intercostal spaces must be distinguished from the "gable roof" effect seen in tuberculosis; the horizontal ribs and increased intercostal spaces seen in emphysema; the restricted motion of the ribs as seen in acute pleural involvements or in fibrosis (either unilateral or bilateral).

Apices and lung parenchyma.—Bearing in mind that clinically the apices are most often the primary seat of tuberculosis in adults, and the importance of an early diagnosis in these conditions, we can appreciate the value of the fluoroscope because of its ability to demonstrate, in addition, the condition of the hilus. The hilus is always affected before the apex is involved, but its involvement gives us no physical signs. The severity of the involvement in the hilus can also be used as an index in the prognosis of the disease. We must bear in mind that the right apex shadow is normally darker than the left, bearing out the physical signs of dullness normally over the right apex. When disease is present in the

lung parenchyma, it is always characterized by shadows of varying intensity, from the mosslike arrangement in early cases to the "contrast" shadows due to the adventitious tissue in chronic conditions.

Diagnosis and prognosis.—We can readily see the value of fluoroscopic observations of the chest when we consider the wide differences of opinion and the different interpretations of physical signs made by recognized clinicians, in any important case. We have observed this in early lung tuberculosis, with negative sputum; in cardiac conditions with absence of murmurs and the presence of hemoptysis as frequently seen in mitral stenosis. In the small proportion of children in which we have observed pulmonary tuberculosis to be present, in one form or another, fluoroscopy has been found of great value in checking up indefinite physical signs, and aiding us in establishing a diagnosis. Diaphragmatic function as observed by the fluoroscopy is of considerable value in determining the acuteness of a given process. The activity of diaphragmatic motion is restricted directly in proportion to the activity and pleural involvement of the tuberculous process present. In the examination of the diaphragm, the fluoroscope possesses one distinct advantage over an x ray plate because the fluoroscopic method enables us to study the motion of the diaphragm in its entirety.

The authors have had an opportunity of observing a case of syphilis of the lung, which had been diagnosed as pulmonary tuberculosis because of the physical signs and had been treated accordingly. In this case (which subsequently gave a positive Wassermann reaction), we were able to demonstrate by fluoroscopy a very markedly enlarged aorta and an overactive "aortobogon" showing advanced aortic disease. The condition of the heart and great vessels in this were demonstrated more clearly by the fluoroscope than by the ordinary physical signs.

Appreciating the importance of a prognosis in chest diseases based on well balanced medical facts, one can readily see the important rôle fluoroscopy may play in clearing up vague "spots" in the lungs. Opportunity has been given us to observe with the fluoroscope decompensated cardiac cases in which we were able to see the effect of medication with digitalis and other cardiac tonics. We were able to see the cardiac outlines of dilated hearts decrease simultaneously with the improvement of the patient's general symptoms and increase when the patient failed to respond to medical treatment; in these cases fluoroscopic examination was of great prognostic value to us. In cases having fluid in the chest the above mentioned method of examination was found more accurate than physical signs and of greater value in determining the prognosis in a given case.

In differentiating chronic bronchitis and bronchopneumonia respectively from tuberculosis and lobar pneumonia it is important to note that the adventitious shadows in bronchial affections are limited to the region of the "bronchial tree," and do not affect the distal parenchyma, whereas in tuberculosis and lobar pneumonia the adventitious shadows always extend well into the parenchyma.

In this brief paper no attempt has been made to cover exhaustively the subject of fluoroscopy of

*The variations of heart contours will be the subject of a later communication.

chest conditions but merely to mention some salient points of value in differential diagnosis which will be readily appreciated by clinicians. Many other points will suggest themselves to clinicians as they pursue the observations of lesions by this method.

Summary.—The fluoroscope is of diagnostic and prognostic value in determining (a) the presence of pathological heart and lung conditions; (b) their stages of development; (c) observing the activity of a given process in lung conditions; (d) the presence amount, character and actual disturbance caused by fluid in the chest; (e) the condition of the lungs and the mediastinum, especially when the seat of metastatic disease.

TRANSPLANTATION OF MUCOUS MEMBRANE OF MOUTH FOR VARIOUS DISEASES AND BURNS OF THE CORNEA.*

With a Report of 150 Cases.

BY RUDOLF C. R. DENIG, M. D.,

New York.

On February 20, 1911, I read a short report of transplantation of mucous membrane from the mouth for cases of trachomatous pannus before the Section on Ophthalmology of the New York Academy of Medicine (*Archives of Ophthalmology*, xl, 4, p. 429). Some deductions, which I had drawn from a case, upon whom I had operated on October 26, 1910, had induced me to take up grafting as a curative measure, whereas, it had only been used for *plastic* operations. In that case I did an excision of the conjunctiva, adjoining the pannus, and found, on trying to close the defect by sutures, that, on account of its size, this was impossible. I therefore did a plastic, taking some conjunctiva from the healthy eye and covering the wound with it. The quickness with which the pannus cleared up and disappeared, was so astonishing, that I resolved to repeat the technic. This I did in 150 cases, using almost exclusively mucous membrane of the mouth as a graft. As a result I conclude that there are four points, which may explain the extraordinary influence of a transplanted piece of mucous membrane on trachomatous pannus.

Ichikawa's paper (*von Graefe's Archives*, lxxix, 1, p. 64) has shown that trachomatous pannus is nothing else than a spreading of the trachomatous process from the conjunctiva over the cornea. Consequently, excision of the conjunctiva, adjoining the pannus, will not do much good, in as much as the excised portion of trachomatous conjunctiva will soon be replaced by a new invasion of trachoma. It is therefore necessary to isolate the trachoma of the cornea from its base—the trachomatous conjunctiva—and this can only be done by covering the defect, created by the excision of the conjunctiva, with a foreign tissue, preferably oral mucous membrane.

Another important point is the improved nutrition of the cornea. Conjunctival tissue, degenerated by chronic trachoma, will certainly not allow first class nutritive material to reach the cornea by diffusion through the capillaries of the

limbus. This will be different, if the conjunctiva is removed and replaced by healthy mucous membrane of the mouth.

Furthermore, not only will the nutrition of the cornea be put on a healthier basis, but the amount of fluid, that filtrates into the cornea, will be increased, because such a transplanted flap exercises a hyperemic influence, similar to the so called Bier hyperemic. Finally it is easily understood, that the graft forms some kind of a barrier against the heavy rubbing of the upper lid on the diseased cornea.

In the pannus cases, I always took care to do away first with complications, such as trichiasis or degenerated tarsi. A certain number of such pannus cases yield, as everybody knows, to the electrolytic destruction of the eyelashes or to the extirpation of the tarsus, but by no means all and among the cases, transplanted by me, I find a number where the extirpation of the tarsus had been done by myself or others where the pannus gave way finally only to grafting.

Basing conclusions on operations extending over seven years, I find a large majority of the pannus cases was definitely cured by one single transplantation, while some had to be transplanted again, to stop the pannus.

Relying on the hyperemic effect of a graft I soon treated in a similar way cases of scrofulous pannus, torpid processes of the cornea, the character of which is often obscure, neuroparalytic conditions and also cases of herpes. The result in all was most gratifying.

Last but not least I practised transplantation also in cases of burns of the cornea, such as are caused by lime and ammonia. I also grafted a case of burn caused by the contents of a golf ball.

We know that opacities, brought on by such burns, are either so called primary ones, caused by the direct contact of the burning substance, or secondary, occurring on the fourth or sixth day after the accident as a result of an impairment of the quantity and of the quality of the nutritive material of the cornea, due to decomposing chemical processes in the burned conjunctiva. I operated in twelve such cases with excellent results, and of the remaining 138 cases, eighty-seven were trachomatous pannus, seventeen scrofulous pannus, twenty-nine herpes, neuroparalytic, and allied processes. In five cases I also did the operation for pterygium.

Regarding technic, the flaps are taken from the inside of the mouth. If the right eye is operated upon, the flaps should be taken, for convenience' sake, from the left side of the mouth. The thickness of the flaps plays a certain rôle, as a thick flap should be used only where a slow absorption is desired. Care must be taken to remove all capillaries of the flap, because they may give rise to hemorrhages during the first five days. On an average a thin flap is absorbed within about one to two years and a thick one may last as long as five or six years.

In the beginning I also grafted skin, taken from the ear, instead of mucous membrane of the mouth. Skin certainly possesses perhaps an even greater hyperemic quality than the former and is not absorbed at all. But I found that in older people the epidermis had a tendency to desquamate. In some such cases I have taken the skin off again and

*Read before the Section in Ophthalmology, New York Academy of Medicine, January 21, 1918.

replaced it by mucous membrane. If both eyes have to be operated upon, it should be done at one time.

The operation is as follows: Along the edge of the morbid process—if necessary all along the limbus—the conjunctiva with subconjunctival tissue is carefully excised, as near to the limbus as possible. The width of the excised conjunctiva should be six to eight mm. Great care should be taken to lay the sclerotic entirely bare, which can be done by means of a scalpel or scarifier; with the same instrument the pannus is also slightly scraped.

This being done, the eye is closed and a suitable flap is provided from the inside of the mouth, the size of the flap depending on whether a total, *i. e.*, a circular, or only a partial transplantation be made.

While the assistant is sewing up the wound in the mouth with catgut, the surgeon trims the flap, removing capillaries and fat or even more of the sub-mucous tissue, as outlined above. The flap has to be rinsed with warm saline solution from time to time. It is now placed on the conjunctival defect and its apex sutured to the remaining bulbar conjunctiva with silk; then more sutures are placed at intervals of about six to eight mm.; they should not be put too close to the edge of the tissues, as they may cut through. A surgical knot has to be made. The graft must lie perfectly smoothly on the defect.

The patient is now directed to look up and inward—the position taken by the eye, when covered by a bandage—and the corneal edge of the flap is trimmed, so as to just cover the limbus. Care should be taken not to let the flap overlap too far, because it may be drawn to the erosions of the cornea, like a pterygium, and thence even creep toward the pupillary region.

A binocular is placed over the eyes for fully five days. The dressing is removed every day, the secretion wiped off, and if necessary, as in cases of burns or herpes, atropine is administered by a glass rod, stuck between the lids near the caruncle, but the patient is by no means allowed to open either eye. By adhering strictly to this rule I have never seen any trouble in the process of healing in the last 107 cases.

After five days—120 hours—both bandages are taken off and the patient may go home one or two days later. The sutures are removed about two to two and a half weeks after operation.

After removal of the bandage the patients invariably state that their eye feels much better than before and a quick recovery takes place.

I have seen herpes to disappear within eight to ten days, severe lime burns to be cured within two to three weeks, dense trachomatous pannus to clear up within four to eight weeks.

50 EAST FIFTY-EIGHTH STREET.

A PLEA FOR THE MODIFIED SLUDER OPERATION *

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My reason for writing a new paper on tonsillectomy, although the literature of the subject is so extensive, are the following:

First, the fact that the Sluder operation is not as popular as it should be, for most laryngologists especially the older men, still practise dissection and snare, whereas the Sluder, should be the operation of choice especially in children.

Second, the unnecessary dread of hemorrhage, not only among general practitioners but also among specialists, who are constantly devising new means of stopping it. With the modified Sluder, there is hardly any primary or secondary hemorrhage at all.

It is interesting that as early as A. D. 10 Celsus advocated enucleation with the finger. Paré in 1509 was so much in dread of removing tonsils, that he advocated tracheotomy when there was a serious enlargement of the tonsils, and Heister in the early part of the eighteenth century said that this operation was too severe, too cruel, and too difficult to become popular on account of the obscurity of the organ. With our present knowledge of anatomy, it is certainly not an obscure organ. The tonsil is situated in the tonsillar fossæ, surrounded by the two pillars, the anterior containing the palatoglossus—the posterior, the palatopharyngeal muscle. The two pillars meet above to unite with the soft palate; below they are attached to the base of the tongue. The tonsil is surrounded by a tough fibrous capsule which is loosely attached to the aponeurosis of the superior constrictor muscle. It is also attached to both pillars by a thin mucous membrane which extends posteriorly to the capsule and to the anterior surface of the tonsils. I advisedly say attached, not adherent, for there are no firm fibrous adhesions, except in cases of unsuccessful previous operations, or in tonsils subject to attacks of peritonsillar abscesses.

From the foregoing remarks one would infer that it ought not to be so difficult to remove the tonsils completely.

A few words about the blood supply in order to appreciate why this operation minimizes hemorrhage: Three arteries, the tonsillar, the ascending palatine, and ascending pharyngeal, pass upward behind the superior constrictor muscle, pierce through it, and divide into small branches which enter through the capsule into the tonsil and the pillars. The main branches that enter the pillars are behind the muscles and only a few small twigs pierce through them. It is therefore clear that if you do not injure the muscle you are not going to have any hemorrhage and all American laryngologists agree that, when indicated, tonsillectomy or complete removal of the tonsils with their capsule should be done.

My *modus operandi* is one which differs but slightly from Sluder's technic, so I do not claim any originality, although I have worked it out myself.

*Read at a meeting of the Eastern Medical Society.

Toxicity of American Made Arsenphenamin.—James C. Sargent (*Journal A. M. A.*, March 30, 1918) records five cases, in four of which toxic symptoms varying from dizziness and faintness to cyanosis, air hunger, and persistent nausea and vomiting followed a single injection. The arsenphenamin was made in America and was said to be the same as the original salvarsan.

I introduce the guillotine with the right hand for the right tonsil and with the left for the left tonsil and catch the lower pole of it in the fenestra, the guillotine in a horizontal position. I then slide up the instrument until I have hooked the posterior portion of the upper pole, the instrument in a diagonal position. I thus have the posterior portion of the whole tonsil in the fenestra. I then lower the handle and press firmly against the anterior pillar, thus pushing the tonsil upward and forward, which produces a bulging of the anterior pillar.

I then use my thumb and push the tonsil through the fenestra until the anterior pillar is flat again by pushing it through forcibly. I thus, separate the capsule from the aponeurosis of the superior constrictor muscle and break down all adhesions, and only leave the mucous membrane still connecting the tonsil with both pillars. This can easily be felt by the finger. I push the blade home—not to cut through the tonsil, but to engage it. I next insert my finger behind the fenestra between the pillars and with a slow downward motion, loosen it from the mucous membrane. The tonsil is usually found caught by the blade and a very narrow strip of mucous membrane above it, but never muscle tissue.

This is virtually a combination of the Sluder operation with finger dissection. I have tried to use the snare instead of the finger, but found it clumsy and much more difficult. It is astonishing how easily the tonsil is separated when one gets in his finger between the capsule and the superior constrictor muscle and follows it down to its end, so that no other instrument is necessary no matter how badly adherent it may be. In very young children after the tonsil is in the ring it is advisable to pull it slightly before separating it so that though the small sized tonsilotome is too large, the tonsils can be completely removed without difficulty.

Sluder uses the eminentia alveolaris and cuts through the mucous membrane. There is no doubt that he is wonderfully successful. In his first report he said it was very easy to do it, but changed his mind in his last contribution in 1916 when he claimed that it was extremely difficult to learn it. I claim my technic is very easily learned on account of its simplicity. I have seen the house staff learn to do it quickly and well after only a few trials, and am sure that anybody can learn to do it if he has only the right teacher. I use the finger because cutting through the mucous membrane, no matter how dull the blade, will produce bleeding. Besides you have to use a great deal of force to cut through with a dull blade.

Doctor Ballenger wrote about the Sluder operation that Sluder had restored order where chaos existed, confidence where fear had reigned, and simplicity instead of complexity, and this is especially true of the modified Sluder operation. It takes but one instrument which is so built that it never gets out of order. There are two sizes, but I only use the smaller one. In very young children one could use a still smaller size, but unfortunately it is not made.

I watch with envy the house staff, without any previous experience, doing remarkably good work, after one has spent years in mastering the fine technic necessary for dissection and snare operations.

It is true that one does not judge the success of an operation by the rapidity of the operator. Still, if one does it just as well, if not better, there is some advantage in doing it quickly. I have done it in twenty seconds, it usually takes two minutes. This includes embedded and badly adherent tonsils in adults. Owing to its short duration we give as little ether as possible and we do not have to wait for complete relaxation. We put the gag in before the anesthesia, in order to gain time. In two or three minutes the child is awake, no vomiting nor retching. What is more important, it can be easily done in the office, where we give soemnoform.

Soemnoform in the hands of one versed with its administration is perfectly safe. The patient is asleep with hardly any struggle in from twenty to thirty seconds. There is at once complete relaxation, pulse stronger, and respiration normal. It is unavailable for the dissection operation on account of its short duration. With this operation, I remove the tonsil and adenoids and still have one half to one minute left. In fact, I advise nervous patients, especially women, to take general anesthesia for they are no more affected by it than by the extraction of a tooth. Less bleeding and hardly any secondary hemorrhage.

Out of 1,000 cases I had only one secondary hemorrhage. He was a bleeder and I advised against operation, but the patient insisted. It was stopped by an injection of pituitrin, without any local measures. The reason there is so little bleeding, is because the source of hemorrhage usually comes from three places, from the middle fossæ, from the pillars and from the injury of the venous plexus, at the base of the tongue. The only possible hemorrhage is from the small twigs which pierce through the pillars. This is insignificant; besides, I use $7\frac{1}{2}$ drops of pituitrin twenty minutes before the operation, as I find this to be the surest means of preventing and stopping both primary and secondary hemorrhage, for pituitrin largely increases the coagulability of the blood. In adults I also use a few drops of 1-3,000 of adrenalin, when the operation is practically bloodless.

Now what are the objections?—The older laryngologists say they are satisfied with the dissection operation. I do not blame any one for hating to give up a technic that has taken many years to master.

Many gave up my technic having failed to remove the tonsil completely, especially in badly adherent tonsils. This I claim is due to faulty technic, for if one follows exactly the directions I gave he cannot fail to remove the tonsil with its capsule completely, no matter how adherent or embedded the tonsil is. Sluder claims complete removal in 99.6 per cent. of cases. Ballenger in seventy-five per cent. This is probably due to his modification of the Sluder instrument, which is not so efficient as the original.

As to the objection that it produces too much traumatism: If one does not use too much pressure, there is hardly more than that produced by the dissection operation.

At first I used a great deal of pressure. I now use but little in children and a little more in cases of embedded and badly adherent tonsils. I try to get away from the uvula, for otherwise, a uvulitis is

produced, which, while not serious in itself, prolongs the patient's suffering and his inability to swallow.

Bear in mind that it is necessary always to examine the tonsillar fossæ if there is anything left, for in tonsils subject to frequent inflammation or peritonsillar abscess one usually finds, after the tonsil surrounded by its capsule is completely removed, a firm mass of connective tissue. This infiltrate is usually found in the supertonsillar fossæ. When the tonsil is pushed through the fenestra it follows the line of least resistance and the infiltrate is left. One need not reinsert the instrument and this is removed in a few seconds. Do not use too much pressure in flat tonsils, as you may buttonhole the muscular bed. Never pull the tonsil, but use your finger to break the attachment, for I have observed a surgeon buttonholing the anterior pillar and thus injuring it. See that the whole capsule is engaged by the blade, otherwise there may remain a ring of the capsule with some lymphoid tissue from which the whole fossæ may regenerate. Hug closely the fenestra when you use your finger, to break down the adhesions, otherwise you may strip the anterior pillar which the snare does very often.

There are a few mistakes a beginner is liable to make: He may not lower the handle—thus losing the leverage necessary and being unable to push the tonsil through completely. This is the most important mistake. He may not use enough pressure to push through the tonsil so that when he pushes the blade home he only engages one half or two thirds of the tonsil. He may still complete it with his finger, but that renders it more difficult and is liable to produce a great deal of traumatism. After the tonsil is pushed through and the blade engages it, he may not hold it firmly enough so that the tonsil slips out again.

I have never noticed any paralysis of the soft palate, nor has the uvula been cut, neither have I seen mutilations and adhesion following this.

BLOODLESS TONSILLECTOMY.

By PAUL V. WINSLOW, M. D.,
New York.

Many instruments have been invented for the removal of tonsils, but none yet have so simplified the operation that any one is used exclusively. This is due to the fact that the instrument has not given the operative results desired, or, in other words, something in the technic has been faulty. The things to be desired in the removal of tonsils are: a minimum amount of hemorrhage, as little injury and disturbance of tissue as possible, the ability to witness every step in the operation, fairly speedy work on the part of the operator, and quick recovery from operation. Professor Beaman Douglass, chief of our clinic at the Post Graduate Medical School and Hospital, has modified the Sluder instrument in such a way that the things just mentioned above are made possible. It is called the Douglass-Sluder and has two blades, one a hemostatic one, which is practically the same as the one in the old Sluder instrument, and the other a sharp or cutting blade. The instrument is introduced to the field of operation by passing it along the outer border of the tongue on the side to

be operated; when the tonsil is reached, the handle of the instrument is moved over to the other side of the mouth, thus obliging the end of the instrument to fall in between the posterior part of the tonsil and the posterior pillar; then by force applied to the handle the tonsil is pushed forward until it presses against the last molar tooth; then by means of the index finger of the free hand the rest of the tonsil is forced through instrument window by making pressure on the anterior pillar; after one is sure that the entire tonsil has been forced through window of instrument, the first or hemostatic blade is sent home and fastened. This blade has also a crushing effect on the tissue of the tonsil and is in great measure responsible for the little hemorrhage we get; the second step in this part of the operation is the cutting off of the rest of the capsule of the tonsil, and this is brought about by driving home a sharp or cutting blade which lies just below and parallel to the hemostatic blade; this takes about thirty seconds. The tonsil is then amputated and can be removed from the mouth by means of a pair of dressing forceps. The instrument is left in position, the dull blade still holding areolar tissue external to tonsil in which all vessels are clamped by dull blade for two minutes, longer if one has reason to suspect a tendency to bleed. Then the blades are released and the instrument is removed from the mouth. By this procedure the blood vessels and other tissues are left in exactly the same position they were in when the tonsil was cut free by the cutting blade. This Douglass-Sluder instrument can be used for the removal of tonsils under both local and general anesthesia. If local anesthesia is to be resorted to, it will be necessary to apply to the pharynx, tonsils, pillars, and base of tongue a ten per cent. solution of cocaine every five minutes until four applications have been made. Then the pillars and the tonsils are injected by means of a tonsil syringe with a one tenth per cent. solution of cocaine together with adrenalin minims twenty to the ounce. Professor Douglass has had splendid results with this instrument in over one hundred cases, both general and local anesthesia being employed. I have used it in a number of cases, and have found it highly efficient. It is not necessary to use force or work in the dark, because you can see every step in the operation, therefore there is no excuse for injury of the pillars, uvula, or soft palate. In using the old Sluder instrument it is usually necessary to apply considerable force in pulling the tonsil out. The use of force in tonsil operations is dangerous, for even in good hands serious results have occurred. The cutting blade on this Douglass-Sluder does away with the use of force, consequently the opportunity is afforded to respect the tissues and blood vessels in the field of operation. In many cases hardly a tablespoonful of blood is lost.

We get less primary and secondary hemorrhage; it can be used in both local and general anesthesia; it prevents unnecessary injury to surrounding tissues; it does not require the use of force; it can be used for the removal of all tonsils; it makes possible the watching of every step in the operation; it permits of quick work on the part of the operator.

125 FALLOUT STREET, BOSTON.

Medicine and Surgery in the Army and Navy

SURGICAL TREATMENT OF PENETRATING WOUNDS OF THORAX.

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The term "penetrating" is used to indicate actual injury of the pleural or mediastinal areas of the chest, whether the missile itself has pierced these or not. Tangential wounds of the parietes may be accompanied by intrapleural lesions as severe in effect as are those of missiles which actually traverse the pleural cavity or lung, and therefore it is necessary to include these, but not purely parietal injuries.

Penetrating chest cases arrived at casualty clearing stations, during a recent battle, in the proportion of about one to forty wounded men.

Chest wounds, at an early stage, divide themselves from the clinician's point of view, into four classes: cases which do not require operation, cases which demand operation at the earliest possible moment, an intermediate class, in which the size of the wound or the severity of the symptoms makes decision as to immediate treatment a very difficult matter, and moribund cases, who probably succumb within a few hours of admission to the casualty clearing station.

Treatment on arrival.—The majority of "penetrating chests" arrive at the casualty clearing station in an exhausted and frequently alarming condition. They should be rapidly examined, put to bed (propped in the most comfortable position, which is usually the semirecumbent), warmed, and stimulated. If they are excited and anxious a sedative should be given hypodermically. Pantopon is, for many reasons, superior to morphia in such cases. If an open "sucking" wound is present, it should be made airtight by suture or gauze plug fixed by broad adhesive strapping. Usually alarming symptoms gradually subside within an hour or two. Further active treatment depends on the severity of the symptoms which persist or develop, and on the size and character of the wound.

Cases requiring immediate operative intervention.—Severe respiratory distress may persist owing to the amount of hemothorax or hemopericardium present. Persistent severe pain is likely due to irritation of pleura or pericardium by a rough foreign body or fragment of rib. Pericardial pain may be referred to the shoulder or side of the chest, one or both. A foreign body actually in the lung or heart does not usually give rise to such pain. The diaphragm is fairly frequently injured and irritated by such foreign bodies projecting into it and dyspnea is then apt to be intense. Increase of respiratory distress may be due to increase of the hemothorax or to rapid development of infection of the blood clot, especially by gas forming organisms. All these conditions demand immediate operation and every effort should be made to get the patient into condition fit to undergo it.

Moribund cases which arrive at the casualty

clearing station die chiefly from the effects of hemorrhage and shock. During periods of severe fighting little can be done for them under present conditions. "C'est la guerre!" During quieter times a small number may be saved by transfusion of blood, which should be done on the operating table so that if hemorrhage recurs as a result of the transfusion it may be tackled without delay.

Necessity to combat sepsis.—As in wounds of other parts of the body, no case can be pronounced free from the danger of sepsis. The earlier it develops, the more serious it is likely to be if not nipped in the bud. Liability to early and fulminating sepsis depends chiefly on the size of the wound, especially of the entrance wound, which again, is dependent on the size and nature of the missile. Sepsis has been the cause of early death in most of the "sucking" wounds which reach the casualty clearing station. Much success has attended efforts to prevent this in cases which were previously thought to be beyond the reach of surgical aid.

Cases of closed hemothorax.—Most patients with punctate entrance and exit bullet wounds and wounds caused by lodging shrapnel balls or small pieces of shell who survive until they reach the casualty clearing station, usually recover from their initial symptoms fairly quickly. All require careful watching. Many cases of entrance and exit bullet wounds cause but slight anxiety. There may be little or no hemothorax. If the hemothorax does not reach higher than the nipple line, shows no sign of increasing, and if there is no evidence of infection, such cases may be sent to the base without danger in the course of three to six days, according to the amount of accommodation available. In any case of hemothorax, if the high temperature, quick pulse, and rapid respiration which are usually present during the first twenty-four hours or so do not subside, recourse should be had to the use of the exploring syringe and the fluid removed should be tested bacteriologically. A crimson purple color of the froth in the barrel of the syringe and a foul odor of its contents are sufficient proof of anaerobic infection. The withdrawal of foul smelling gas alone is conclusive enough evidence. Such examination should be made every day or every second day according to the nature of the case. The test is by no means infallible. Sepsis may develop in islands or areas of the clot or fluid which are not tapped by the needle. Increase of pneumothorax or development of resonant patches in previously dull areas should make one suspicious of gas infection. If, then, other symptoms pointing to infection are sufficiently prominent, operation should be undertaken without waiting for bacteriological confirmation. If for any reason, such as the presence of severe wound elsewhere, a case of limited aseptic hemothorax has to be kept in the casualty clearing station, there is in most cases no need to aspirate the chest as the fluid is usually absorbed fairly rapidly. If not, aspiration should be done and bacteriological examination made. In some cases there is found a mild infection, which repeated aspirations may cure.

If the hemothorax is a larger one, the patient should be kept for a correspondingly longer period. During the first three days, aspiration may be required at any time in order to relieve symptoms of distressed respiration. The aspiration should be done slowly, and only that amount of fluid removed which makes the patient reasonably comfortable. Aspiration of a large quantity during this period may restart hemorrhage. If urgent symptoms develop again, it is probably best to operate at once, make a large opening in the chest wall, clear out the pleural cavity, control the source of the hemorrhage, and close the opening completely. After the critical three days, in other cases the bulk of the fluid may be withdrawn, preferably with replacement by air or oxygen. If the patient is fit to travel to the base, however, he should be sent there before this "final" aspiration is done. The above remarks regarding sepsis, the use of the exploring syringe, and other procedures apply with greater force to cases of large hemothorax than to those of minor degree.

As already remarked, between cases of "closed" chest wounds and those with "open," possibly "sucking" wounds, there exists a fairly large number in which decision as to treatment is fraught with great difficulty and anxiety. The possibility of giving relief to the patient and preventing a problematical development of sepsis must be weighed against the danger which the operation necessary for such a double purpose involves. Statistics show that the ordinary empyema operation in these early cases is attended by a very high mortality. In many early cases more thorough cleansing operations followed by complete closure have been attended by very striking success, but a sufficient number of cases has not yet been recorded to permit of reliable judgment being made. One cannot help thinking that the more frequent use of blood transfusion in the early stages will lead to better results and permit of successful radical operation in a greater number of "intermediate" cases.

The mortality from sepsis at the base appears to indicate interference in a larger number of cases at the casualty clearing station. The small piece of shell or shrapnel ball has apparently a more deleterious effect than it is thought to possess by some.

Severe open wounds.—There now remains a large number, twenty-five to thirty per cent., of cases which from the nature of their wounds demand operation at the earliest possible moment. Operation is performed in such cases with a twofold desire—to tide the patient over the acutely dangerous period brought on by hemorrhage, collapse of lung and displacement of organs, and to prevent sepsis getting a hold. Mere closure of the opening in the chest wall will attain the former object, unless, as already pointed out, the position and character of the lodged missile or displaced fragments of rib cause too great interference with the function of vital organs. But mere closure of the wound will not prevent development of sepsis, which, in this class of case, is usually extremely virulent and lethal. Thorough excision of lacerated tissue and removal of bloodclot and foreign bodies are as essential for success here as in other parts of the body. The incidence of sepsis at different stages and the resultant mortality in the earlier days of the war

when compared with that occurring now furnish complete justification for the radical operation in severe cases. The decision as to the proper time for its performance should result from the close collaboration of a skilled surgeon and a level-headed enterprising physician. Many publications have been made recently on the treatment of these severe cases and to these attention is recommended. (Duvall, *Les plaies du pectoral*, 1917. *Papers in the British Medical Journal*, November 3, 1917, and December 15, 1917.)

Captain J. Anderson classifies the cases belonging to this group as follows:

Wounds caused by large irregular fragments of high explosive shell which have lodged in the thorax. These are almost always associated with (a) clothing and infection carried in, and (b) open "sucking" wounds of the chest wall; tangential wounds of the thorax, enflaming the ribs and driving portions of the bone, etc., into the pleura and lung; entrance and exit bullet wounds in which the exit wounds are explosive in character.

Those belonging to the first variety are most serious and fatal. Those belonging to the last are probably least so and respond most favorably to excision and closure, because infection of the pleural cavity in them is caused by secondary advent of organisms through the open wound.

Discussion of the extraordinary variations of the lesions which occur in the thoracic viscera and of the positions which foreign bodies take up is not necessary or desirable in such an article as this. Suffice it to say that they may be extraordinarily simple and easy to deal with or demand great skill and dexterity combined with ample courage on the part of the surgeon. The heart as well as the lung has shown itself to be tolerant of manipulation and attack of the surgeon's knife. There must be a considerable number of men alive today who have had this part of their anatomy penetrated by bullets and other missiles during this war. X ray localization is of inestimable value in cases where bullets or fragments of shell have lodged in the chest. It indicates often that a route of approach other than through the wound must be chosen and of course facilitates precision and prevents unnecessary manipulation and loss of time during the intrathoracic part of the operation.

Choice of anesthetic.—As there is considerable likelihood of inflammation appearing in the contralateral lung, the use of ether should be avoided, when possible. If a general anesthetic is used, nitrous oxide gas and oxygen is the one to be preferred. Many of the cases can be done perfectly, easily, and painlessly after local infiltration of the tissues around the wound or site of fresh incision, aided by blocking of the intercostal or other nerves supplying the part. The technic necessary for success in most cases is easily acquired.

Operative technic.—It is important to obtain access to all parts of the pleural cavity. Since drainage is not made at the end of the operation there is no need to make the opening low down. If the wound is high up on the front of the chest or involves the body of the scapula, a fresh wound should be made in the region of the fifth rib below the axilla. Otherwise the approach is oblique

through the wound made by the missile after excision and possible enlargement thereof. The opening should be large enough to admit the surgeon's hand freely and to enable him to inspect every part of the cavity. It will probably be found most suitable as a routine measure to remove four to five inches of the fifth or neighboring rib unless several adjacent ribs are involved in the smash and require removal.

The original wound or wounds are excised, en masse if possible—skin, subcutaneous tissue, muscle, bone, and edges of pleura in one piece. The pleura should be preserved as much as possible. If this wound does not give suitable access to the pleural cavity, it is stitched up, layer by layer. If the pleura has been destroyed too much to allow apposition of its edges, then the muscles are sutured, catching up the remnants of pleura so as to present as smooth a surface as possible to the expanding lung and to prevent pocketing. If both pleura and muscle are shot away in great extent, the hole can still be covered over completely by sliding a flap, possibly containing muscle, and suturing completely. Then a fresh incision is made through the chest wall over the fifth rib, which is resected, and the pleura-periosteum is divided by a clear cut along the middle of the leg of the rib. It may be necessary, in order to get freer access still, to divide the rib above or below.

The edges of the wound are strongly retracted. A self retaining retractor is found to be of considerable value. The fluid blood is siphoned off through a wide drainage tube or else the patient is tipped over. Blood clot is scooped out with the hand. Swabbing out the blood takes too long a time. It should not be done except for the last ounce or two. Adhesions may have to be broken down or divided in order to get the pleural cavity thoroughly cleaned, but if possible they should be left intact. (If the lung is adherent all round the wound, further operation entails simple removal of the foreign body, cleaning, and draining the track.) A rapid survey is made of the interior of the cavity. The lung is dealt with as is found necessary—seized and pulled out, foreign bodies or fragments of rib removed, or the part where they lie clamped, excised, and sutured; the track in the lung is cleaned out, possibly rubbed with antiseptic, and bleeding controlled by ligature, suture, cautery, or gauze plug; gangrenous or very badly lacerated lung is excised and the part sutured, and so forth. Special forceps and clamps are not really necessary. The use of a cotton glove on the hand which controls the lung will make manipulations easier. If accessible, foreign bodies imbedded in the spine or mediastinum are removed and the bed in which they lay is chiseled away or cleaned out and antiseptized. The pleural cavity is then wiped dry and the wound in the chest wall closed completely. If it is not likely that immediate expansion of the lung will cause hemorrhage, the air in the pleural cavity should now be slowly aspirated, completely or partially according to the extent of the pulmonary lesion. The application of the mastisol dressing referred to in a previous paper, Treatment of War Wounds of the Brain and its Coverings, is of value in the after

treatment by giving extra support and preventing dragging on the sutured area.

Wounds of the diaphragm.—If the diaphragm is torn, repair of the rent by trimming and suture should be the first step of the intrapleural procedure after the cavity has been cleared of fluid blood and clot. Wounds of abdominal viscera frequently accompany such an injury and a variable amount of prolapse into the pleural cavity may be present. Some such cases may require treatment through an anterior abdominal incision but others are more readily treated, especially if the periphery of the diaphragm is affected, by enlarging the original wound, resecting a rib or ribs, dividing the diaphragm parallel to its fibres downwards from the rent in it, and then prolonging the incision downwards and forwards to any required extent in the abdominal wall. In such cases the lung frequently escapes injury, and after removal of fluid blood and clot the pleural cavity can usually be closed off and aspirated before the abdominal part of the operation is undertaken, by suturing the diaphragm airtight to the chest wall around the upper periphery of the original wound. It is astonishing to what a height and at what tension the diaphragm can be sutured in this way, with practically no subsequent distress to the patient. In multiples injuries the treatment of a "sucking" chest wound should always take precedence.

Routine aspiration during the period of after-treatment.—Physical signs are apt to be misleading as to whether fluid is collecting in the pleural cavity or not after such operations, and routine aspiration should therefore be made, within twenty-four hours of operation and at least every second day thereafter. Resection of rib will thus be rendered unnecessary in many cases. Even although definitely purulent fluid tends to accumulate, repeated aspiration is often all that is necessary to effect a cure. If, however, severe constitutional symptoms appear, a drainage operation should be carried out.

Evacuation to the base.—Such cases should be retained at the casualty clearing station if possible until they are able to be out of bed and move about the ward without detriment. Even in very busy times they must be kept until it is fairly certain that a secondary drainage operation will not be required.

REHABILITATION OF THE REJECTED.*

By WILLIAM HILLS SHELTON, M. D.,
New York.

It was with considerable hesitation that I accepted Doctor Southworth's invitation to read a paper on the work of the Volunteer Physical Reclamation Committee, for it has been in existence so short a time that our figures are necessarily meagre. Furthermore, we are interested primarily in getting men who have been rejected by the army for being underweight and underdeveloped into the services and not in any scientific experiment, so our statistics are not elaborate.

It was in April, 1917, that I first interested a

*Read before the Medical Association of the Greater City of New York, January 21, 1918.

physical instructor, Mr. Arthur McGovern, in the idea of building up men who were rejected by the army and navy for physical defects, and he agreed to hold classes in physical drill at the Cornell Medical College, three mornings a week. At our request the navy recruiting office at 34 East Twenty-third street, New York, referred a number of men who were acceptable to them except that they lacked the requisite weight and development. These men entered the classes in physical drill and were also instructed in hygiene. We were encouraged by the results obtained in those men who came regularly, but so few were able to take the time from their work that after two months the classes were given up. Nevertheless I believe the scheme to be entirely practical if it were only possible to run evening classes.

This fall I consulted Dr. W. Gilman Thompson and Dr. Lewis Conner, who were most enthusiastic and encouraged me to go ahead. I realized that the biggest problem was to get a place to hold classes, and but for the help of Dr. Arthur H. Cutler, of the Cutler School, I do not know when the classes would have started. I happened to mention the idea to him and he immediately offered me the free use of the school gymnasium.

The next problem was to get the cooperation of some recruiting officers. Both Captain Adams and the Medical Inspector Doctor Alfred and his staff at 34 East Twenty-third street were more than interested and promised to refer all those men who would be suitable for our classes. We received equally cordial support from the marine recruiting office in Twenty-third street, especially from Doctor Arnold, the medical officer in charge. I then approached Mr. Elwyn W. Poor, who most enthusiastically entered into the spirit of the scheme, and largely through his efforts we now have a small but efficient organization for handling the business of the committee. Mr. McGovern volunteered his services as physical instructor and the Volunteer Physical Reclamation Committee was formed.

On Monday evening, November 16th, the first evening class was held in the gymnasium of the Cutler School, 49 East Sixty-first street, and to our great surprise and pleasure sixteen men attended. From that day classes have been held regularly every Monday, Wednesday, and Friday evening at eight o'clock. We have outgrown our facilities at the Cutler School, and, early this month, moved to the Cornell Medical College, where shower baths have been installed at considerable expense.

PROCEDURE.

On entering the class a card record is made out for each man, on it are written his height, weight, measurements, occupation and age, also heart, lungs, and blood pressure examination. I have a personal talk with each man with regard to his habits, work, etc., and advise him as to diet and hygiene. The following printed slip is also given out.

Most men who are underweight have poor muscles and are underdeveloped. The object of these classes is to build muscles, particularly of the chest and abdomen (stomach); this aids the circulation of the blood, helps nutrition and increases the power of digestion and assimilation. This enables you to eat and digest an amount of food that would otherwise upset you.

Attend the exercise class regularly; this is important. On alternate days go through the exercise at home, if possible.

Food.—For breakfast take a large soup dish of oatmeal, in which has been dissolved two large tablespoons of butter. Drink one, and preferably two glasses of milk. At 10 a. m., 4 p. m., and at bedtime drink one and, if possible, two glasses of milk. If you can not get milk, drink at least two quarts of water between meals. For lunch and dinner eat all the bread and butter you can, in addition to your meal. Instead of dessert, eat a dish of cereal, such as wheatena, cream of wheat, shredded wheat biscuit, etc. Eat little meat and few eggs; these are expensive and neither fattening nor strengthening. Eat as much fruit and green vegetables as possible; they keep the bowels open and improve digestion. Potatoes eaten with plenty of butter are splendid food. Avoid fried foods, cakes, pies, pickles, pork, and corned, canned, or smoked meat or fish. Drink no alcoholic liquors and not more than one cup of tea or coffee during the day. Eat slowly and chew the food well.

Rest.—Get at least seven hours' sleep each night, try to rest for fifteen minutes before and after each meal, and never do any strenuous work for at least an hour after eating.

Fresh Air.—Sleep with the windows wide open. Spend as much time in the open air as you can. Walk from one to three miles a day. Practice deep breathing while you walk. Hold yourself erect, chin in, stomach in, chest out. Point the toes straight or slightly inward; this strengthens the muscles of your feet. Take a cool or cold bath every day; if you have not a bathtub, wet a towel with cold water, wring it out, and rub yourself down till your skin is glowing and red. Brush your teeth night and morning; see that all cavities are filled. Speak to the doctor if your teeth bother you.

If you use tobacco, only smoke after meals and never before. Don't chew. Excessive smoking will keep you thin. It lessens your appetite, upsets your digestion, and makes your heart action rapid and irregular.

Keep away from bad women—the loose woman is a greater menace to your health than the bullets of the enemy.

Don't hesitate to come to us with your troubles. We are interested in you as individuals and stand ready to help you in every way we can.

When you get your weight, don't go back to the recruiting office without letting us know. We need this information to keep our records straight, and we wish to show how many men are anxious to serve their country at more than the average sacrifice.

After the men have been instructed they are divided into squads of twelve and put through a physical drill. We only have small squads as we believe it impossible to handle more men effectively. In larger ones, some of the men shirk the work. The exercises occupy about twenty minutes. We have selected those exercises which develop the chest, abdominal, and foot muscles especially, for we believe the greatest benefit is obtained by increasing the chest expansion, improving digestion, stimulating the general circulation and raising the arch of the foot. No apparatus is used. The men are instructed to take the exercises at home on alternate days, but to take no other exercise except a moderate walk during which they are to practice deep breathing.

After the exercises each man takes a warm shower, followed by a cold one and a bath cold, and is then given a pint of milk and as many crackers as he can eat.

Since November 16th we have records of a total of 116 men who have attended the classes, of these, for one reason or another twenty-eight dropped out and of the remainder, sixty-four are now attending the classes. Twenty-four have gained the requisite

amount of weight, returned to the recruiting office and been accepted and are now in the army or navy. Besides these men whom we know have been accepted, the boys tell us that several others have joined various branches of the services. Apart from the number of men actually reclaimed for the army and navy, the effect of the work on the men is most excellent. They carry themselves better, wear cleaner underclothing, and have a general air of increased self-respect.

Types of men referred.—Most of the men referred to us are of a type familiar to all of you. Whether tall or short, they have long chests, badly developed with narrow subcostal angle; stooping shoulders and wide intercostal spaces with ribs slanting downward at an acute angle. Low centrally placed hearts are common, and not a few have functional murmurs which clear up after a short period of training. The long enteroptic type of abdomen is often observed.

But the spirit of these men is splendid. It has been a revelation to us all to observe their enthusiasm and earnestness. They seem to be ready to do anything if they can only get fit enough to enter the service of their country. Handicapped physically as they are, nature seems to have compensated them with a fine sense of duty and enthusiasm.

We feel that our small experiment has been a success and hope to extend the work. More than anything else, however, we hope that others will start similar classes in other parts of the country. But merely throwing open gymnasiums is not enough, too much work, especially undirected, as unfortunately it generally seems to be, is worse than none at all. Moreover I will go so far as to say, that, to put a man into a gymnasium where his work is not overseen is a real menace to his health. In our classes we have had a number of boys who had been losing weight at the Y. M. C. A. gymnasium, where their work was without direction, and who have immediately gained weight rapidly under our treatment. Valuable as we believe the exercises to be, we insist that if the advice on hygiene and diet were omitted, there would be slight, if any, gain in weight. There seems to be an almost unlimited field for such work as we have been doing not merely in building men up but in the correction of deformities, not only in times of war but in times of peace, in rebuilding the wrecks. More important yet it is a means of spreading through the community the idea of a proper method of living.

Vaccines for the British Army.—The total amount of vaccine prepared and issued, or at present in stock, for the three and a half years of war amounts to 25,000,000 doses of one c. c., equivalent to an average daily output of 20,000 c. c. The whole of this vaccine has been prepared, standardized, and tested by the medical officers of the department. A large part of the bottling of the vaccines has been carried out by teams of voluntary lady workers, who attend for some hours on certain days, about seventy litres of vaccine being bottled in an afternoon. The vaccine is practically all issued in rubber capped bottles holding twenty-five c. c. and fifty c. c., about twenty gross a week being used.

SOME OF MY OBSERVATIONS IN FRANCE.*

BY MAJOR W. A. GARRETT,

Assistant General Manager, Remington Arms Company.

Our commission, sent to France by the War Department to study the French railroads and report on their requirements to take care of the American expeditionary force to be sent over under General Pershing, consisted of William Barclay Parsons, of New York, chairman, the engineer who built the subway, to give special attention to rivers and harbors; William J. Wilgus, formerly vice president of the New York Central, to study maintenance of ways and bridges; Mr. F. de St. Phalle, of the Baldwin Locomotive Works, to study locomotives and cars, and my study was transportation. We were able to report in part to the department that the railroads of France were in as good average condition as the average American railroads today. We had the word of French officers that the moment the railroads go down, that moment the country loses a war. The British have a problem similar to our own; that is, to handle men and material from the west coast of France to the fighting line. In England, in the effort to economize in every possible way, little notice cards are put on your table, "Don't waste bread; if half a slice is enough, please do not cut the whole slice. Every one must save bread; it is a national duty. Will you help?" The difference between England and the United States is this: The situation is serious and England knows that to be true; the United States does not yet know that to be true, but we will all know it soon.

We reached Folkestone forty-eight hours after a German aeroplane had killed thirty-eight people, principally women and children. France has seen her own people killed, male and female enslaved, women worse than enslaved, their houses looted and destroyed, their streams and wells polluted, and the very ground from which they must get their living shot up to almost utter uselessness. War is just what Sherman said it was—plus. The French people are not so much impressed with what the German army has done as what it did not do, because on paper the Germans had the best gambling chance to win that any country could have after forty years of preparation. We were told in France that the Germans were so sure of getting into Paris that when the battle of the Marne was fought they had left their big guns back in Belgium. Joffre's handling of the railroads was such that the Germans could not get down the larger guns if they had tried. The Pressed Steel Car Company here in America has orders to build a certain number of steel freight cars for the French government. They are built in this country, knocked down, and sent over seas, and erected in France by the German prisoners. They were paying these men four francs for each day's work, with a possible one franc extra as a bonus, provided they did more than their day's work. We were told that ninety per cent. of the German prisoners were making the one franc extra.

On the British fighting line we saw that wonder-

*Abstract of paper read at patriotic rally under the auspices of the Philadelphia County Medical Society, April 26, 1918.

ful aggregation of British fighters from England, Ireland, Scotland, Wales, Canada, Australia, the West Indies, New Zealand. One sees hundreds of miles of shot-up trenches and thousands of miles of barbed wire fences and entanglements, and the wonderful hospitals in charge of those splendid men and true, godly women. But one also sees the graveyards, hundreds upon hundreds and thousands upon thousands of graves everywhere; white crosses for the Allies, black crosses, marking the Germans. From German prisoners were taken postcards reading, "You will take no prisoners. Show no mercy. Show no quarter. Make yourself as terrible as the Hun who said, 'Where our footsteps fall let no grass grow for a thousand years.'" The German soldiers are trying hard to carry out the order, and are doing the job well. This is what General Pershing has put out: "Your first duty is to be soldiers; your second, and scarcely less important, to help those who are poor and weak. You will be courteous to all women. Abstain from wine and liquor. Be kind to little children. You will fear God and honor your country and win the war to liberty. God bless you and keep you." Our commission did not witness any German atrocities; that was not our study. But there are commissions in both Belgium and France who are taking the historical record, so that when the time comes for the long table conference, with Germany on one side and the Allies on the other, there will be an accounting from which there can be absolutely no escape for the Germans. The British are protecting in the northeastern part of France approximately 125 miles of fighting front from Belgium into France, and the average distance between the British Channel and the British fighting line is approximately fifty miles. Where we, the American troops fight, it is over 400 miles from the coast to the fighting line. The British have 750 British locomotives in France; 49,500 British freight cars in France; 98,620 odd transportation men for a fifty mile haul, and we have a 400 mile haul. The British also have on this fifty mile fighting front over 200,000 laborers of twelve nationalities to unload ships, work upon the railroads, highways, canals, supply stations, and railway yards. In other words, 200,000 laborers and 100,000 transportation men for a fifty mile performance, and we have a 400 mile performance. The American people have absolutely no thought of what they are up against. When the second Liberty Loan came out, less than ten per cent. of our people thought sufficient of the war to loan the Government money. We shall know, however, that we are at war when we see cripples, cripples—everywhere, when our hospitals are full to overflowing, and when your boys don't come home. General Petain told us about Verdun. He was at Verdun when the Crown Prince made the attack, one of the greatest attacks the world has ever known, because Emperor William wanted to have the Crown Prince do something worth while. General Petain decided to hold Verdun, and he issued the famous order, "They shall not pass—Petain," which is still painted on the fort at Verdun. General Petain told us that as soon as it was decided to hold Verdun they decided to do three things: Build a thirty six mile double

track railway from Fleury to Doune, and it took 60,000 men three months to build it. They then decided to make a narrow line of three feet gauge which they had into a double track. The call for engines and cars for this work was so urgent that passengers and freight were left standing out in the country. The third thing which they did was to make a pike into a double width that automobiles might pass. Automobiles going to Verdun with men and materials had the right of way. We looked across the valley where the Crown Prince of Germany lost over 500,000 men trying to take Verdun. In each German regiment they have what they call a "hellish squad," the duty of whom is to poison wells and to connect with electric batteries everything movable. Every soldier in Europe today rides in box cars and on flat cars, and if there is any complaint about our passenger car service in this country, keep that fact in mind. The food situation in certain parts of France is very critical. Few people in this country understand what that splendid man Hoover is trying to work out. He is not trying to save you the cost of living, but to prevent starvation in Europe and here. The French people are very tired. They have fought the war for over three years. They have lost 1,300,000 men killed, and you cannot tell how many men crippled—crippled—crippled! All that France can give our people today is air, water, and standing timber. Claveille said: "Don't send any bridge timber, dock timber, or railroad ties. Send your foresters over to cut our standing timber." When we left Paris, coal was selling for \$45 per ton, and you could not get the full half ton which Doctor Garfield gave you last year. It had never been my good fortune to meet General Pershing until I was in France. He endeared himself to the French people because he went to the tomb of Lafayette and said, "Lafayette, we are here!" Four words, and then the French people knew that the American commander was a man of action and not of words. Until we reached Peronne, today in the hands of the British. I thought the destruction of trees was a military necessity. There we saw, on each side of the boulevard, trees fifty or sixty years of age. The Germans had deliberately cut each tree three quarters through with an axe; every tree standing and every tree dead. Over 46,000 women are working on the French railroads. In England the "British Women's Army Auxiliary Corps" are getting approximately 50,000 women to be sent to France to act as clerks, cooks, and chauffeurs. The American women—God bless them!—they will do the right thing when they know the job before them, and the job is there! My father was a birthright Quaker, but having seen France, I am absolutely certain that we should have in this country universal military training.

Shall we win? Yes! Just as sure as the sun rises in the east, *because we must*. How long will the war last? Until we win. Our Government, however, has very wisely mapped out a long time program. But consider the bigness of the war. Money by the billions, men by the millions, ships, aeroplanes, and it is in the program. The war program is the biggest transportation program that

the world has ever known. My message to those who stay at home is: Economize. Don't waste. Be an American first, and all the time. Let your criticism of our program be constructive, not destructive; stand behind the Government and ask yourself each day, "What am I doing to help?" And for those good men and true women who go abroad to win our war; good luck to and God bless them!

MEDICAL NOTES FROM THE FRONT.

Wounds of the Spine and Cord.

GENEVA, March 4, 1918.

I shall discuss the prognosis and treatment of these wounds in the light of knowledge acquired during the past three years. The prognosis is essentially subordinate to the extent of the lesions, but, *a priori*, it can at once be said that all these cases are serious. If we look over the older statistics we see in the Crimean War there were seventy-six French with fractures of the spine and probable lesions of the cord. None survived, and in the same war, of thirty-eighty instances among the English, twenty-eight died. The four soldiers who survived presented fractures of the spinous or transverse apophyses only, the cord remaining intact.

In the Franco-Prussian the German figures are:

Wounds of the cervical region of the spine, mortality	61.3%
Wounds of the dorsal region of the spine, mortality	70.9%
Wounds of the lumbar region of the spine, mortality	71.0%

In the French report of the same war, only eighteen patients survived these lesions, while Dent gives a mortality of from fifty to sixty per cent. due to lesions of the spine and cord in the Boer War. During the first year of the present war, Weiss and Gross of Nancy had thirty-six cases under their care, fifteen of the subjects dying in a few hours after the receipt of the traumatism. Of course there are as yet no statistics on the subjects, so that I shall be brief in my remarks.

It may be taken as certain that in the vast majority of cases it is serious, particularly when the fracture is comminutive and when bone splinters injure the cord or result in severe compression. The outlook in these cases is essentially bad. However, certain traumata of the spine may end fortunately. For example, I know of cases in which laminectomy for the removal of the missile or a bone splinter or the incision of a hematoma compressing the cord have been successful, even resulting in complete recovery, but this does not apply to cases where the cord has been profoundly injured. Here the mortality is, as might be assumed, very high. Prognosis must be measured by the extent of the lesions. When the cord is completely divided, death usually ensues, very soon from respiratory disorders (asphyxia), or in a few days from meningitis or myelitis, rarely after the lapse of several weeks, in which case it is due to septicemia from infection of the urinary tract and to extreme cachexia resulting from this infection and from the infection produced by decubitus sores, which may be very extensive.

On the other hand, when the lesions of the cord

are limited in extent and only involve a small portion of the nerve axis or are the result of compression by a bone splinter or the missile itself, the prognosis, although far from brilliant, is less serious, because by laminectomy the condition may be properly dealt with and appreciable results obtained. I would also point to the fact that Marie has had under his care five soldiers who were hit by projectiles in the cervical region of the spine. In all five the wound produced an immediate and persistent paralysis of the four limbs, followed by sphincteric disturbances. Then, at the end of some weeks or months, a progressive improvement occurred, the patients regained power to dress and to eat alone, and some of them could finally walk or even run.

Again, Marie has stated that out of a total of twenty-five wounds of the cord, recovery has occurred only in instances of wounds of the cervical and lumbar portions and cauda equina. Wounds in the dorsal portion of the cord have been always serious, and he points out that the vertebral canal is very large at the neck and lumbar region, and at these regions there is a greater mobility of the spine. It is narrower in the dorsal region, where the vertebrae are practically immovable. This decrease in calibre, combined with the want of mobility, may perhaps explain that in those cases where the missile has not severed the cord, the latter is most usually contused or crushed against the bony walls, while in the cervical or lumbar regions the cord can more easily escape the projectile.

As to the conclusion to be drawn from these several opinions it would seem that lesions of the lumbar segment of the cord and cauda equina are the least serious, and other observers opine in the conclusion that lesions of the cauda equina, even when sphincteric disturbances result therefrom, are of more favorable prognosis if the patient can pull through the dangerous period or urinary and decubitus infection, or better still, avoid them. But in the case of the difference in gravity between lesions of the cervical and dorsal portions of the cord, it is difficult and even foolhardy to attempt to offer a distinct solution of the question. It will be only by statistics which shall appear at a future date that any principle can be formulated in this respect, as all documents of any value are as yet wanting. However, I see no reason at present for not saying that the higher the site of the cord lesion, the more serious it will be, and this for the reason that the lesions in the cervical region, when extensive, are more fatal.

Now, turning to the treatment of wounds of the spine and cord. Consider first the wounded man on the battlefield. So soon as a man says that he cannot move his lower limbs and has been hit in the back near the middle line, the stretcher bearers must consider him as having a fracture of the spine. His transportation requires the utmost precaution. At the dressing station an antiseptic dressing is applied and an injection of morphine given if pain is severe or spartein or some other cardiac stimulant is to be exhibited if shock is manifest. Further transportation is not advisable if it can be avoided. Marie, however, maintains that these cases can support transportation to a neurological hospital at the rear

and that if this is done their chances are better. Therefore, if at the clearing station the surgeon thinks the patient can stand it, it is evident that such a course will be preferable. When the patient reaches the base hospital, he should not be immobilized and removed from the apparatus in which he traveled. A nicely applied wadded dressing around the trunk and neck will fulfil all the necessary requirements for maintaining proper reduction of the parts. Exceptionally, comminutive fractures of the spine may require a more complete immobilization.

What should be the surgeon's conduct in these cases? All things considered, it is evident that when the cord is compressed by a bone splinter or the missile, an operation should be done at once, provided it is simple in character. We know that the cord is intolerant of foreign bodies, and by their removal we may eliminate the factors of irritation which otherwise will surely terminate in meningitis or myelitis. Operation will often be advantageous, sometimes useless, but will always be innocent of complicating matters if done with all due aseptic precaution. Laminectomy has many warm partisans both in France and in Germany, and I know that some of the Huns have pushed the indications to their full extent, but as is usually the case in most everything pertaining to the war, they have carefully avoided giving their results, good or otherwise. Consequently, at the present writing, I feel that laminectomy can be admitted in principle, in cases of wounds of the spine and cord, and as to its indications and contraindications. Of the former it can be admitted that all lesions of the cord are amenable to operation. It certainly would be premature to formally settle the question, but it would seem logical to suppose that when the cord is injured by a fracture of the spine or by the presence of a projectile in the medullary canal, the majority of such cases should be operated on. Complete division of the cord requires no interference, as the data derived from an experience of three years show, but its absolute diagnosis is not always an easy matter.

A traumatic meningitis or compression of the cord may very well reproduce the characteristic symptomatology of complete division, and I know of one case in which an apparent complete division of the cord was followed quite quickly by an improvement in the symptoms after laminectomy, a fact which would seem to show that the cord lesion, regardless of evidences of complete division, was capable of repair.

From all the data collected, it may be concluded that laminectomy is generally admitted and that it is relatively harmless, but it should not be undertaken excepting in cases of compression of the cord and when all danger of infection can be eliminated. The causative factor of the compression must be a missile or bone splinter of easy removal, likewise a hematoma or rather a hematorrhachis when a return of the symptoms leads one to suspect that the cuff formed around the cord by the clot is undergoing organization and sclerosed transformations. An intra or extradural abscess is also an indication for laminectomy, and I would not go so far as to say that suture of a partially divided cord is to be rejected, because there is one successful case reported

by Lortat-Jacob, and this fact in itself is quite enough to encourage us in our attempts in this direction.

The contraindications for laminectomy are not numerous. One must abstain only when the patient is still in a too pronounced condition of shock, or if fatal abdominal or thoracic complications are present at the same time. Ascending myelitis may also be a contraindication, but decubitus sores, if not too deep, are not.

Laminectomy is urgent when there is irritation of the meninges or cord, particularly from bone splinters, but it is conditional in other conditions. Most surgeons are of the opinion that the operation should be done early, during the third or fourth week following the receipt of the injury before the advent of pyelonephritis, etc., or if the signs of improvement tend to subside.

Before the end of the first two weeks the shock and neighboring lesions make the exact diagnosis questionable, but when all is said, it is probably better to free the cord from any existing compression as early as possible and before secondary degenerative processes have started, and we know that these begin at an early date.

CHARLES GREENE CUMSTON.

MEDICAL NEWS FROM WASHINGTON.

What the Purchase of Supplies Means—How It Affects Surgical Supplies?—Shall the Doctors Control Transport of Wounded?—America's First Hospital Ship.

WASHINGTON, D. C., June 1, 1918.

One of the busiest divisions of the office of the Surgeon General of the Army is that that has to do with the purchase of supplies, and the supply division has acquired a vast amount of special material for the medical service. It has had to do with the purchase of articles ranging from motor ambulances and surgical instruments to pills, and, for example, it is charged with the provision of everything that is needed by a base hospital or a field hospital.

The division has purchased enough gauze to spin a thread that would reach to the sun and back. It may be said that not an organized base hospital, field hospital, or ambulance company has gone abroad for service unsupplied with every last detail of its allotted outfit; not a camp in the United States is lacking in medical outfits prescribed by the regulations, and a reasonable economy has protected all outlays of funds appropriated by a government insistent that sick and wounded shall have all that money can do for them.

The supply division of the medical department is in charge of Colonel Edwin P. Wolfe, of the regular medical corps.

The military-naval authorities are encountering, as they had anticipated, great difficulty in obtaining instruments and appliances for the use of the military and naval surgeons. There has been a peculiar situation created in regard to instruments because of the fact that most of our instruments had been imported from Germany before the war.

Efforts were made promptly to obtain this material from American manufacturers, but their resources were not sufficient to meet the demands, and it has been necessary to obtain some instruments from Japanese sources. Some progress also has been made in arousing interest on the part of concerns in this country that never have made instruments of this kind, notably those that hitherto have made scissors, knives, and other cutlery articles, but with all of this available and prospective source of supply it is apprehended that it will be exceedingly difficult to obtain the instruments in the quantities necessary to meet the medical officers' requisitions. These are coming from Europe in increasing volume, and so much so that recently it was considered worth while to cable General Pershing and ask if some mistake had not been made in a requisition that looked as if it were excessive.

* * * * *

The Surgeon General of the Army is in favor of legislation that will provide that "When a state of war exists, the transportation necessary to transport medical and hospital supplies of all kinds, and the sick and wounded of the army, whether by land or water, shall be under the exclusive control of the medical corps."

This is regarded by medical officers as essential for the maintenance of the efficiency of the medical department, which must now, under existing law, depend upon the quartermaster facilities in the transportation of medical supplies and the sick and wounded. It is insisted that much better service under better regulations could be rendered if the medical department took care of its own transportation. Of course, this would mean the creation under the Surgeon General of a transportation branch, such as already exists in the matter of ambulances. This would present no difficulty, the need being met by the simple process of providing congressional authorization and the funds necessary for the acquisition of animals, animal-drawn vehicles, and motor vehicles. The medical officers believe that the advantages to be derived from this system of exclusive control are obvious and are regarded as entitled to receive the approval of Congress.

* * * * *

The U. S. S. *Comfort*, Medical Inspector C. M. Oman, U. S. Navy, commanding, is about to sail for the war zone to bring back sick and wounded of the army and navy. In view of her theoretical immunity as a hospital ship, the German government will be notified of her departure, her course, and her destination.

This will be the first hospital ship under the American flag to enter the war zone, the army having no hospital vessels, depending upon returning transports to bring back sick and wounded, and the transportation of them being under the auspices of the navy.

The *Comfort*, which formerly was the Ward liner *Saratoga*, will bear all the identifying marks of a hospital ship, as prescribed by the Geneva convention, and she will not be convoyed on her voyage of mercy.

Meningitis at Camp Greene.—Paul G. Woolley, captain, M. O. R. C. (*The Journal of Laboratory and Clinical Medicine*, April, 1918), states that in a period of over two months there were only twenty-nine cases of cerebrospinal meningitis of the meningococcic type in a camp population of between 30,000 and 40,000. Such an incidence cannot be termed epidemic, especially when one considers the ideal conditions for the transmission of disease which prevailed during the winter months at the camp. The available statistics would indicate that the percentage of carriers in Camp Greene was between five and seven. It is a fact worth noting that not a single case developed in the only organization which used systematic nasal sprays since the first of the year, and among the other units, where sprays were adopted after the appearance of the disease, cases did not develop. Woolley says that this may be only a coincidence, but the fact that the total sick rate, especially that due to respiratory diseases, fell after commencing to use the sprays, seems to be something of a triumph for dichloramine-T, and its use as a prophylactic in diseases of the respiratory tract is recommended.

Primary Suture of Wounds at the Front.—Anthony Bowlby (*British Medical Journal*, March 23, 1918) reviews the progress that has been made in the treatment of the infected wounds of the war since the beginning of hostilities and points out the gradual development of the primary suture of wounds and the progressive improvement in the results with the extension of its practice. The following conclusions can now be drawn relative to the treatment of infected wounds: Most important is the careful cleansing of every part of the wound, followed by complete excision of all dead, badly damaged, or infected tissues, with the removal of only a very narrow edge of the skin. Asepsis must be absolute in the excision and experience at the front alone enables one to make proper selections of cases which are suitable for this treatment. Suture may be performed immediately, or the wound be left for two to four days after excision and then sutured with equally good results. When the wound is left for later suture it should be so dressed that it need not be disturbed until the time for suture. Following suture the patient must be retained in the hospital for at least one week, and if he cannot be so kept the wound must not be sutured. Even after the most careful excision the wound is rarely sterile, but the presence of a few aerobic or anaerobic bacteria do not prevent its suture or healing. Hemolytic streptococci are the most dangerous, and if found, the wound should be reopened at once. The earlier, after receipt of the wound that the suture and excision can be performed, the better is the outlook for uninterrupted healing. If there be definite gas gangrene, or if the wound edges have already become indurated and inflamed suture must not be undertaken. When there is doubt as to the advisability of suture it should be postponed for a few days after complete excision. The method is applicable to all forms of wounds and gives most excellent results in connection with compound fractures and joint injuries.

Editorial Notes and Comments

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RECOMMENDATIONS OF THE AMERICAN HOSPITAL ASSOCIATION.

The spirit of earnest determination definitely directed to specific needs marks the deliberations of the War Committee of the American Hospital Association in their recent conference at the Academy of Medicine on June 3d. They faced the present and increasing shortage of physicians and nurses in the civilian hospitals and the problem of providing for the future supply through the student body. The question is not only in regard to the number of interns and nurses who shall carry on the necessary work of the civilian hospitals at the present time, but the providing from these two bodies, as well as through the student body in the medical colleges, an adequate supply for increasing war service and for civilian needs.

Men are not sufficiently prepared for either service without at least one year of hospital service, and yet these men are subject to withdrawal by draft before this service has been completed. Various suggestions were made and discussed as to the advisability of eliding the course of study, which however seemed an unwise measure, except under greater emergency pressure than at present. This

matter presents itself therefore as one of those which the Government must definitely take under its control, for it is a vital problem how to fit medical recruits for service and to provide also that the student ranks shall be filled with some assurance to the entering student that he will not be called away before training is completed.

As for the actual and unavoidable shortage of interns existing at present, it was urged that there could be much greater relief by employment of technicians, orderlies, and clerical and other aids who could to a large extent relieve the pressure upon the intern and allow him to devote himself to actual medical service. This has already been done to an appreciable extent, and even the army has detailed soldiers to the work of orderlies, for example, the New York Hospital. There is a difference in the experience of various medical schools and hospitals. Some report no shortage in applications on the part of students or of interns, but it is usually the smaller hospital which is hardest hit, and in many larger ones as well the force eventually is depleted. The situation in the schools for nursing seems to be similar. Here too the shortage in student applicants is not making itself felt in some of the best hospitals, but the overwhelming demand for nurses proves a severe drain upon those already available and also raises the question of whether to utilize the student supply, also considered an unjustifiably short-sighted measure. The establishment of the army training schools at the cantonment will provide some relief, but recommendations were made for still more immediate measures to answer the demands from abroad and to provide the necessary nursing for the civil population. The training of part time aids and attendants for war and civilian service and the utilization for this purpose of many women who would willingly give part time for civilian nursing under such a system has much to recommend it. Their training under medical authority would render available a goodly body of workers for the pressing need at home. This also provides further facilities for the extra demand for nursing which will arise soon, when the wounded are returned in large numbers.

The careful consideration and discussion of these problems led to the adoption of the following resolution, which should recommend to the Government some effective means of regulating and improving the present situation in the face of growing needs:

Resolved That under the direction of the Federal Health Administrator or other suitable Federal authorities, a campaign should be prosecuted for maintaining an adequate supply of medical applicants and of properly

trained physicians during the war. In so far as the extension of the existing facilities for training may become necessary, the means for such extension should be provided by the Government.

Surveys in medical and nursing fields, which have already been undertaken by governmental and private agencies, should be extended, coordinated, and completed. A program should be prepared and carried out in cooperation with the military authorities for the most effective disposition of students of medicine who are of draft age, and for the modification of their training to meet war requirements. Medical institutions, physicians, and nurses should be brought under the direction of the Government whenever necessary to insure adequate attention to the needs of the civilian population.

PYOGENIC THERAPY

Under the term pyrogenic therapy Auld has described some new phases of the benefits that accrue with certain fever producing substances. Especial benefits were obtained in the treatment of subacute infections, in localized infective processes, and in other conditions. He noticed that the intravenous injection of from two to ten c. c. of colloidal metals, such as platinum, gold, silver, and copper, produced a sharp rise in temperature and other evidences of a systemic reaction, and that subsequently the temperature dropped to and remained normal. Frequently the injection was first followed by a negative phase and fall in temperature, but the rise soon followed. Such a reaction could not, of course, be obtained in acute pyrexias. It was obtained, however, in such subacute conditions as subacute pleuritic or pneumonic processes, protracted paratyphoid fevers, arthritis, etc. It is thought that the colloidal metals act to reinforce the natural peroxidase action of the iron of the hemoglobin. In these conditions there is defective oxidation of the oxidative processes of the peroxide peroxidase system, of which the iron of the hemoglobin is the active element. The introduction of the new peroxidase in the form of the colloidal metals reinforces the natural peroxidase when there is some bar to its effective action.

It was found later, however, that the colloidal metals were protected by veal peptone and glucose, and that the protective substance, the albuminous portion of it, could produce the pyrogenic action by itself. The pure colloidal metals produced the accompanying symptoms of the pyrexia, but not the pyrexia. A great many substances, some of them even inert, can produce pyrexia and are, therefore, pyrogenic. Chiefly pyrogenic substances include killed bacteria, proteoses, nucleic acid, protected colloidal metals, etc. It does not matter particularly which pyrogenic substance is selected for use, as long as it is

actually pyrogenic. But since any of these substances produced pyrexia, no matter how small the dose, it has been suggested that it is not the pyrogenic substance which is the direct cause of the reaction, but rather that the matrix of the pyrogen is in the blood plasma, and that it never changes no matter what pyrogenic agent is used. The pyrogen matrix is anaphylatoxin, and the pyrogenic substance, the antigen, merely serves to evolve the anaphylatoxin. This is the reverse of the split protein theory, in which it is held that the reaction is the result of the splitting up of the foreign protein into its component elements on contact with the blood elements. In substantiation of the pyrogen theory it was observed that, although typhoid vaccine was beneficial in the treatment of typhoid, the same result was obtained with bacillus coli vaccine. Hence there was nothing specific in the action of the typhoid vaccine. Moreover, arthritis, certain skin affections, and other conditions were benefited by this vaccine. In other words, the behavior of the vaccine was the same as with the protected colloidal metals. The "nonspecific vaccine" theory and the "protein shock" therapy are based on the pyrogenic action of these foreign proteins which cause anaphylatoxin to be evolved from the blood plasma. While the result is the same, the action is not in accord with the split protein theory. Both the theories, however, explain the significance of anaphylactic sensitization by foreign matter and the benefit to the organism. For pyrogenic therapy typhoid vaccine is probably the best material to use. It can be given in doses of from fifty to 250 billions without danger provided it is not contraindicated by the presence of high pyrexia, arterial disease, high blood pressure, cardiac conditions, etc.

But how it is that the release of the anaphylatoxin, with its rise in temperature and critical drop, produces the beneficial results is not understood. Various hypotheses have been advanced. It has been ascribed to leucocytosis, to rapid mobilization of the antibodies, to stimulation of the nonspecific ferments of the serum—the protease and the lipase, etc. On the other hand, it has been suggested that there is a rapid and active passage of the bacteriolytic substances thus released from the blood into the lymph spaces surrounding the foci of infection.

ESTHETICS AND HEALTH.

The connection between individual health and beauty, though seldom recognized in theory, is intimate in practice. True, they are connected by a long leash and the leash is often severely

strained for long periods by the fickle members of the pair, for esthetics embrace many extravagances of human fancy, represents, indeed, human fancy: Wasp waists, flattened heads and deformed feet are as vagarious as anything done on canvas by the cubists, but they are of passing moment, for always, in real as in ideal beauty, the healthier survives.

The outward signs which accompany internal cleanliness and harmonious working of parts, the shapeliness that comes with normal nutrition (supernormal nutrition is the father of the ridiculous in life, as in art), the strong and elastic movement that signifies a well working nervous system; these things, in every age, have most to do with survival, mating, and reproduction of our kind.

As might be expected, there is also, to the pursuit and practice of public health, an esthetic as well as a purely sanitary side, and the two have kept a nearly even pace. Because herding together in large and fixed groups is comparatively recent, the development of public esthetics has been backward, nor has its connection with health been so evident until after recent scientific discoveries. The disposal of sewage was, and to a large extent is, purely a matter of getting the body waste out of sight and smell, of being sweet and neat. During the Middle Ages filth was, even in large cities, dumped indifferently out of the back if not the front window, the senses being evidently but slightly offended by such a condition of affairs. While the presence of exposed fecal matter is always a menace, from possible contamination of water or food supplies, where food and water are amply protected its presence is of comparatively little moment from a sanitary standpoint. The esthetic sense of the twentieth century, however, acts as a safeguard to public health, even to the extent of maintaining expensive plumbing systems.

The disposal of garbage is, again, chiefly an esthetic matter, for garbage, save as an incubator of insects, is harmless enough. A dump for ashes, tin cans and dead cats may be of little significance as far as health is concerned, but it is not likely nowadays to go uncomplained of by the neighbors.

One of the chief means for the furthering of public health consists, not so much in preaching the need of sanitary conditions, as in awakening the sense of beauty—of pride in the appearance of private and public premises and in community cleanliness, for the city beautiful is likely (so far as sanitation is concerned) to be the city sanitary. On the other hand, where efforts must be

made to compel communities into ways of better health there always goes an awakening to pride in appearance. A virtuous circle in inaugurated, no matter from which incentive sanitation is begun.

The Greeks made the hidden parts of their temples as perfect as those open to public view, and when we develop a public esthetic sense of such a superior sort we will have little fear in matters of public or of private health. Until then, the health officer must serve as the very active and aggressive priest of Hygeia, though he will do well to encourage the esthetic sense of the multitude as well as to enforce the laws of his goddess.

CLINICAL LABORATORIES IN THE ARMY.

In a charming personal narrative Doctor Hornsby, the editor of *The Modern Hospital*, tells in that journal of his own experience as a patient in the Mayo clinics at Rochester. The reader cannot but be impressed with the high degree of specialization practiced in the organization of these clinics. Even so simple a thing as the introduction of a stomach pump is made a matter of specialization and with admirable results.

The high degree of specialization in diagnosis noted in the Mayo clinics is characteristic of the age, and it is in consonance with this tendency that the Surgeon General of the United States Army has organized a division of infectious diseases and laboratories, one of whose functions is the provision of numerous mobile laboratories in which the most improved methods of laboratory diagnosis will be available for the aid of the army surgeon. In order to standardize the work of these laboratories, the division of infectious diseases and laboratories has compiled a war manual (*Medical War Manual No. 6*; Lea & Febiger) for the guidance of the laboratory chiefs. The manual is in no sense a text book, but is a collection of formulas and technical methods which will be useful in carrying out such laboratory examinations as the officers of these departments will be called upon to perform, either in stationary or field laboratories. All the officers assigned to this work will have been trained as bacteriologists, consequently detailed instructions are not necessary, but such things as the strength of solutions, and of media are easily forgotten and these are given in convenient form for reference. The Surgeon General also considers it desirable that there should be at least a certain amount of uniformity in the methods used in the laboratories, in order that the findings of different laboratories may be comparable with each other.

Our soldiers are fortunate in having at the head of the medical department an officer whose principal

professional interest is in sanitation, and who therefore has no difficulty in realizing the importance of laboratory work in medicine. Indeed, the programme which has been adopted by the Surgeon General is a most ambitious one, and will have a most salutary and far reaching effect on the practice of medicine in civil life, for when the medical reserve officers return to civil life at the close of the war, they will undoubtedly demand those laboratory aids which they have been supplied with in the army, and the value of which they will have learned by experience. We therefore, look forward to a much wider development after the war of what might be termed the Mayo idea in the practice of medicine, that is, the utilization by the practitioner of every possible scientific aid toward correct diagnosis.

FROM ZEPPELIN TO GOTHAS.

With the gradual depletion of hospital staffs and increased occurrence of air raids in London, the Emergency Surgical Aid Corps find it hard work answering all the calls for their services. Moreover, Lieutenant General Sir Francis Lloyd reminded his staff that he was not at all sure that a day might come, much more quickly than they expected, when their services would be required up to the very hilt. There was always a chance of a last throw by the Germans, even if it proved only a temporary success. Surgeon General Sir William Norman, of the Royal Navy, also reminded them that the number of wounded in the navy had been small because the crew had gone down with the ship, but they must remember that battleship had not yet met battleship, and they did not know at what time, or where, they would need all the help they could lay hands on. With regard to the air raids, the relief parties, ambulances and nurses were thoroughly organized, but they must be ready for ever increased attacks. There were bomb proof covers for some 500,000 or 600,000 and splinter proof shelters for over a million. Another difficulty they had was in convincing people that they were safer in their own basements or cellars than in running to the raid shelters. It was easier to prepare for action when only Zeppelins came. They could always be heard and seen, but now the machines were invisible from their small size when at a great height and it is difficult to trace them with searchlights. It was easier to see the new Gothas, but they did more damage. Still, there had been improvement in the signaling. There was now a warning from the coast, which gave them time to gather the relief party; then came the second warning, "Prepare for raid action." When big raids occurred, with perhaps some 500 wounded, their plan was to send at least one surgeon, one assistant surgeon, and one anesthetist in answer to a telephone call from an hospital, and the Royal Automobile Club had been greatly helpful in placing cars at disposition for long distances. Although hundreds were "shocked" besides those really wounded, every one behaved splendidly.

It was a curious sight to see the little children on their way to school next morning picking up pieces of shrapnel for "war tokens."

MORE TAXES.

Additional war taxes must be imposed, and a bill to provide for these is now being drawn up by Congress. Germany has financed the war by loans apparently with the idea that these would be paid off by indemnities to be demanded by victorious Germany. She has even been compelled to borrow money to pay part of the interest on her war loans. France has borrowed money for about 80 per cent. of her war expenditures, England for about 75 per cent., and the United States proposes to borrow money for about 50 per cent. of the amount spent in carrying on the war, raising the money to pay the difference by additional taxation.

We must be prepared to meet this taxation with a cheerful spirit, bearing in mind that the taxpayer only gives money, while the soldier gives life itself. In collecting these taxes care must be taken to so adjust them that they will yield the best returns with the least possible interference with the laws of trade. The introduction of the zone rate of postage on periodicals in the tax bill of 1917 was a colossal blunder which should be retrieved by a repeal of this particular phase of the law. In fact, it was not a revenue law, though ostensibly it was one. Under it the present system of periodical circulation, which is the product of years of development, is radically changed and a very great burden placed upon all periodicals having wide circulation. This zone system of postage has been condemned by experts regardless of party affiliations as being ineffective from an income point of view and disastrous in its bearing on periodical literature. We urge our readers to ask their Congressmen to vote for a repeal of this system as unjust, discriminatory, and useless.

News Items.

Wounded Soldiers Returned from France.—The War Department announces that during the week ending May 17th, 106 sick and wounded soldiers arrived in the United States from France and were sent to military hospitals. Eight were landed during the preceding week.

A British Hospital for American Wounded.—On May 20th the United States took over a British war hospital in London for the care of wounded American soldiers. It has 2,000 beds and will be operated by an American staff consisting of fifty doctors, 150 nurses, and 300 orderlies.

The Meeting of the American Medical Association.—The sixty-ninth annual meeting of the American Medical Association will be held in Chicago, June 10th to 14th. A telegraphic summary of the proceedings will appear in the June 15th issue of the NEW YORK MEDICAL JOURNAL.

Personal.—The honorary degree of Doctor of Laws was conferred upon Surgeon General William C. Gorgas, United States Army, by New York University, at the annual commencement, held Wednesday, June 5th.

Dr. Charles Gilmore Kerley has resigned as professor of pediatrics at the New York Polyclinic Medical School and Hospital, to take effect June 1, 1918.

Dr. Judson Daland, of Philadelphia, has been ordered to active duty as consulting physician to the Fourth Naval District, which includes Philadelphia, with the rank of lieutenant commander.

Vacancies in Staff of Beth Israel Hospital.—Announcement is made that there are several vacancies in the house staff of Beth Israel Hospital, 70 Jefferson Street, New York. There is a mixed medical and surgical service of one or two years. Application should be made to Mr. L. J. Frank, superintendent.

Meetings of Medical Societies to Be Held in New York during the Coming Week.—Monday, June 10th, Society of Medical Jurisprudence, Yorkville Medical Society, Williamsburg Medical Society; Tuesday, June 11th, Manhattan Dermatological Society; Wednesday, June 12th, Medical Society of the Borough of the Bronx; Thursday, June 13th, West End Clinical Society.

Medical Society of the State of New York.—The 112th annual meeting of this society was held in Albany, May 21st, 22d, and 23d, under the presidency of Dr. Alexander Lambert, of New York. Dr. Thomas H. Halsted, of Syracuse, was elected president to serve for the ensuing year, and other officers were elected as follows: Dr. James F. Rooney, of Albany, first vice-president; Dr. Marcus B. Heyman, of the Manhattan State Hospital, second vice-president; Dr. Floyd M. Crandall, of New York, secretary, and Dr. Frank Van Fleet, of New York, treasurer.

An Army School of Nursing.—Surgeon General Gorgas has been authorized by the Secretary of War to establish an Army School of Nursing, with branch training schools in various selected military hospitals throughout the United States. The courses given at these schools lead to a diploma in nursing, and if the military hospitals are discontinued before the completion of the course, owing to a cessation of hostilities, credit in a civil hospital will be given student nurses for the work done. For full particulars address the Army School of Nursing, Office of the Surgeon General, Washington, D. C.

City Hospital Alumni Society.—The following officers were elected at the annual meeting of the society, held on Wednesday, May 15th: President, Dr. Charles Ogilvy; vice-president, Dr. Walter Seymour Reynolds; secretary, Dr. William M. Patterson; treasurer, Dr. Perry Bartlett Hough; committee on science, Dr. Charles Ogilvy, ex-officio, Dr. William Steinhach, and Dr. R. Garfield Snyder; committee on entertainment, Dr. Walter Seymour Reynolds, ex-officio, Dr. Eugene Smith Dalton, and Dr. Lesser B. Groeschel; committee on new active members, Dr. Ralph Waldo, Dr. Douglas A. Quick, and Dr. Edward V. Amett; committee on new associate members, Dr. Albertus Adair Moore, Dr. William P. Healy, and Dr. David S. Likely.

Surgeon General Gorgas's Retirement Opposed.—Three national medical societies, the American Laryngological Association, the Laryngological, Rhinological, and Otolological Society, and the American Otolological Society, at their annual meeting held in Atlantic City, N. J., last week, passed resolutions urging that Dr. William C. Gorgas be retained as surgeon general of the U. S. Army after October 1st, when he will have reached the age limit which would automatically place him upon the retired list. The petitions, which will be forwarded to President Wilson, request that Surgeon General Gorgas be continued in office as long as he is physically able to perform his duties. It is said that similar action will be taken by the American Medical Association in Chicago next week.

Merger of Columbia and the Presbyterian Hospital.—According to a report in the local press for June 5th, there has been a break in the relations between Columbia University and the Presbyterian Hospital, and the project for the fifteen million dollar merger of the two institutions has been abandoned, or at least is in danger of being abandoned, on account of differences which have arisen between the boards of the two institutions. Under the original plans, each party to the merger was to meet half of the costs. The hospital advanced \$85,000 to cover the option of the land on Broadway, 165th to 168th Street, but according to the hospital authorities, the College of Physicians and Surgeons of Columbia University failed to meet the stipulations of the agreement so that the merger has lapsed, or is in danger of lapsing. The president of the university, Dr. Nicholas Murray Butler, has stated that Columbia did not have the funds which would be required to move the buildings to the proposed site, but the hospital did have its share of the funds, but he believed that the differences could be adjusted. One of the conditions laid down by the hospital authorities was the resignation of the entire faculty of the medical school.

Hospital Problems of the War.—A conference was held at the New York Academy of Medicine, Monday, June 3d, under the auspices of the War Service Committee of the American Hospital Association, for the purpose of discussing the many hospital problems resulting from the war. Dr. S. S. Goldwater, chairman of the committee, presided.

The War and Interns in Special Hospitals.—The following information regarding interns in special hospitals is the result of interviews with officers of the Surgeon General's Department by a representative of the American Hospital Association, and is believed to fairly represent the policy of the department with regard to interns in special hospitals:

"For two reasons the Department of the Surgeon General of the Army has signified its desire to promote the education of interns in proper hospitals for as long a period as the exigencies of war will permit; primarily, that the future military surgeon may begin his medical career with as much professional experience as possible, and secondarily, so that the organization of hospitals for civilian treatment and for instruction of physicians and nurses may not be unnecessarily disrupted. How far do these considerations apply to certain special hospitals such as hospitals for women, children, consumptives, eye and ear cases, and insane, and what should be the policy of the Army with regard to interns in such institutions?"

"It seems clear that thorough education in all types of cases treated in the above, except maternity and children's hospitals, will have definite value for military purposes, and that the same policy with regard to interns in these should be followed as in general hospitals. Probably the children's hospitals may be placed in the same category as the others, as the medical and surgical experience gained therein is such as to afford a substantial foundation for military service, and this, taken into consideration with the desire to preserve the hospital organization, should warrant the placing of children's hospitals on the same basis as general hospitals so far as intern service is concerned.

"With hospitals for women the situation is very different. Service therein is intensive in a branch of medical science which has no direct relation to military needs, and therefore such hospitals cannot receive the same consideration as other hospitals as places of preparation for military service. On the other hand, it would seem that in such hospitals the organizations could be properly maintained by the aid of personnel not fitted for army service. Not every medical student is eligible for active military service of the kind to be anticipated and desired by the young medical man who has at last reached the place in his career where he can be of great value to the country.

"General hospitals should give first choice to those who are physically fit for the work in the Army and Navy, while young men who are not physically handicapped should equally seek internships in hospitals where they can obtain the best possible training for military service. Those who, by reason of physical disqualifications, are not entitled to enter the country's service in its military branches should welcome the opportunity to aid in its general efficiency by engaging in other work essential to warfare.

"Thus, by cooperation between hospitals and between hospitals and student, can we come nearer to a solution of the tremendous problem of making the supply of medical men meet the requirements of war.

"With the use of women physicians, medical students and the proper allotment of student interns to places where they can be of the greatest use according to their qualifications, it would seem that an obvious difficulty may be at least minimized, and the authorities in medical schools can aid materially in advising their young men as to the proper course to pursue. Some men who have a special interest in obstetrics and gynecology may dislike to abandon the opportunity to specialize in such branches during the period of their internship, and surely the country cannot afford to be without the services of men so especially educated, but the needs of our fighting men are immediate and imperative, and our young men will no doubt be willing to sacrifice their personal ambitions for a time as many of the older men of the profession have already done."

Modern Treatment and Preventive Medicine

A Compendium of Therapeutics and Prophylaxis, Original and Adapted

RECENT OBSERVATIONS IN DIGITALIS THERAPY.

By LOUIS T. DE M. SAJOUS, B. S., M. D.,
Philadelphia.

(Continued from page 1045.)

That digitalis may properly be looked upon as a many sided remedy, the beneficial effect of which is exerted clinically in one or more of several different ways, according to the precise nature of the cardiovascular disturbance existing in the individual case, was pointed out in the preceding issue. Equally divergent, apparently, are the results of digitalis action in the normal mammalian heart when compared with those produced under abnormal conditions, the normal heart proving comparatively refractory to certain of the digitalis effects.

In the excised mammalian heart subjected to what is termed the "therapeutic stage" of digitalis action, the excursions of the ventricles may be so increased that the energy of each beat is more than doubled (Sollmann, 1917). Without stopping to investigate whether these experimental "therapeutic" doses are, strictly speaking, comparable with the small therapeutic doses employed clinically, we may note from the start that, in so far as its influence on the nutrition of the heart muscle is concerned, digitalis seems to act in a widely different manner on normal and abnormal myocardiums. Refuting earlier views to the effect that continuous administration of digitalis in animals induces hypertrophy even of the normal heart muscle, Cloetta, 1908, reported experiments indicating that therapeutic doses of this drug do not cause hypertrophy of the normal rabbit's heart. Recent sphygmomanometric studies by Barringer, Jr., 1917, appear to suggest that a discrepancy of effect between normal and abnormal hearts exists also as regards the so called reserve power of the heart muscle.

By reserve power, Barringer understands the added functional activity of the organ which can be called forth when the body passes from rest to muscular activity. In the normal heart, shortly after work performed, *e. g.*, by means of dumbbell movements, the systolic blood pressure and pulse rate rise in accordance with the amount of energy expended in a given time; upon cessation of the movements they return rapidly to the previous figures. When a certain amount of work is reached, however, a different type of blood pressure curve results, the maximum pressure occurring, not within thirty seconds after completion of work, but at a later period—fifty to ninety seconds—when the pulse rate has already receded toward normal. Barringer accepts as a criterion of the heart's reserve power the least amount of work which will induce the delayed rise in systolic pressure or cause the first pressure reading made after the performance of work to be lower than the original level. That digitalis causes no increase whatever in the reserve power of normally functioning hearts was indicated in three of his patients, suffering respectively

from pulmonary tuberculosis, pyloric ulcer, and esophageal cancer. Although each of these individuals had a markedly reduced cardiac reserve power as compared to the average for their respective ages, digitalis, even in large doses, caused no increase. On the other hand, in a patient suffering from rheumatic endocarditis and slight cardiac insufficiency, with some dyspnea on climbing stairs, digitalis in full doses, in each of the periods in which it was administered, caused a marked though temporary increase in the cardiac reserve power. This increase was especially pronounced when the amount of digitalis absorbed had been sufficient to induce toxic effects, the reserve power at this time approaching the normal for the patient's age.

A significant difference in the response of the normally functioning but low reserve heart to daily graduated exercise from that to digitalis seems also indicated by Barringer's clinical tests. While, as we have already seen, digitalis caused no increase of reserve power in the three cases of low reserve but normally functioning heart in which it was administered, daily graduated exercise with dumb bells in a patient with low reserve power—ascribed to a combination of hard mental labor, lack of exercise, insomnia, repeated attacks of bronchitis, and tobacco and alcohol—increased the reserve power from 300 to 3,000 foot pounds in the course of two months. Similar results were obtained from graduated exercises in a patient suffering from aortic regurgitation and cardiac insufficiency with very low reserve power. Thus, whereas in the presence of cardiac disease, graduated exercise and digitalis appear to act in a measure alike as regards the reserve power in the heart, with normal electrocardiogram and physical signs but with impaired reserve power digitalis seemingly fails while graduated exercise is beneficial. Without venturing to assume that this betterment in reserve power is wholly or mainly due to improved nutrition of the myocardium, we are afforded herein a definite example of inability on the part of digitalis to exert on the normal heart an influence manifestly produced in the case of certain diseased hearts.

Again, as I have already indicated, clinical evidence is available to the effect that under certain abnormal conditions, *e. g.*, in patients with adynamic or unstable hearts, or with auricular fibrillation, the amount of digitalis necessary to reduce the pulse rate is less than in the case of a normal heart. H. W. Stevens, 1916, among three cases with normal heart rhythm observed but one instance of slowing of the rate under digitalis, and in this patient the rate had been high before the drug was given, while in the other two it had been approximately normal. Of five cases of arrhythmia, on the other hand, all but one showed slowing under digitalis. The rôle of heightened temperature, as in fever, in hindering reduction in heart rate by digitalis, is well known. The cause of slowing, where it does occur under this drug, may be different, according to Cushny, 1917, under certain abnormal conditions, especially

in the presence of cardiac malnutrition, from what it is normally.

As regards the output of blood from the heart, Heinz, 1900, showed experimentally that the increase of output under digitalis varies according to the extent to which the organ has become weakened before the administration of the drug;—the more marked the weakening, the greater the increase of output.

Finally, the action of digitalis upon the blood pressure shows manifest variations under normal and abnormal conditions. Whereas in health the blood pressure, as demonstrated in recent years, is seldom raised by digitalis, Hernando, 1911, found experimentally that where the pressure has become reduced through hemorrhage, the drug will effectually assist in raising it toward normal. On the other hand, in heart disease causing carbon dioxide accumulation, the blood pressure is frequently lowered by its ingestion.

(To be continued.)

Gunshot Injuries of the Peripheral Nerves.—

Leo Mayer (*International Journal of Surgery*, March, 1918) points out that the treatment of nerve injuries should be begun immediately after their occurrence. If the musculospiral or the anterior tibial is affected the limb should be splinted in such a way as to relax the affected muscles. It might also be well to splint the limb in such a position to bring the nerve ends as near together as possible. In addition to the splinting, massage and electric stimulation should be employed. Galvanic, faradic, and high frequency currents may be used. Primary nerve suture is seldom possible after a gunshot wound. As soon as the primary action has subsided and the infection has been controlled, the question of immediate operation or of waiting for the spontaneous return of function presents itself. A few practical rules are: When the symptoms of a nerve lesion are progressive, operate at once; if the symptoms are regressive, do not operate; where there is no change in the extent of the paralysis or of the sensory symptoms, wait until the wound has healed, and then determine on the basis of the anatomical course of the nerve and the direction of the pull whether there is a strong probability that the nerve was directly injured by the passage of the projectile. If so, operate; if not, wait still longer. In the operative treatment; if the nerve is seen to be merely traumatized or pressed upon by a bone fragment or scar, nothing should be done except remove the external cause of the pressure. If due to scar tissue, some means should be taken to prevent its recurrence. This is best done by a change of position of the nerve. If a small nodule of scar tissue is felt within the nerve, this area should be excised and the nerve united by a fine perineural stitch. If scar tissue is generally present throughout the nerve, two courses are open: if a small quantity is present, it can be removed by careful dissection; if extensive, the area must be carefully excised and suture performed. When a nerve has been completely divided, there is nothing to be done except suture. The postoperative treatment consists in the proper splinting and daily massage and electric stimulation. The prognosis on the whole is good.

Röntgenotherapy in Cervical Adenitis.—George E. Pfahler (*New York State Journal of Medicine*, March, 1918) discusses the results which have been reported by others following the röntgen treatment of cervical adenitis and concurs in the belief that when properly carried out this form of treatment gives excellent results. In every case the source of the infection of the glands should be sought and removed first if possible, such as the tonsils, infected teeth, etc. Where the gland, or glands, are soft and fluctuating then they should be incised and drained. Where the case is seen very early and the glands have not softened röntgen therapy alone is usually permanently curative, if the source of infection can be removed. The treatment requires considerable time and where this is not obtainable the glands had better be dissected out by a surgeon. After surgical operation on the glands two full courses of röntgenotherapy should be given. The common general measures relating to hygiene and diet should be followed in all cases. The röntgen treatment should be given with hard rays, properly filtered to avoid skin reactions, and the hair and face must be properly protected. Usually two portals of entry for the rays will suffice for one side of the neck and the exposures should be given at intervals of one month to avoid cumulative effects and skin injury. Dermatitis must always be avoided. The röntgen treatment demands as much skill as does the surgical and is as dangerous in the hands of the inexperienced as the attempted surgical removal of the glands by dissection.

Partially Autolyzed Pneumococci in Pneumonia.—E. C. Rosenow (*Journal A. M. A.*, March 16, 1918) emphasizes the fact that about two thirds of pneumonia cases and a similar proportion of deaths are due to types of pneumococci for which no specific serum is yet available, and records his further results with the use of polyvalent, partially autolyzed, pneumococcic vaccines. In a series of 200 unselected cases of pneumonia treated by this preparation there were but fourteen deaths, or a mortality of only seven per cent. When the injections were begun before the third day of the disease the results were good, or strikingly good in 136 and were indifferent in fifty, of the 186 cases which recovered. The earlier the injections were begun in the course of the disease, the better were the results, both as to recovery, duration of the illness, and the development of complications. When the injections were begun on the first day the average duration of the fever was only three and one half days; on the second day it was five days; and on or after the third day it was seven days. Local reactions were very common, and there were no constitutional reactions or harmful effects from the treatment. The usual dose for an adult was about twenty billion partially autolyzed pneumococci in one mil of normal saline, and for children it ranged from one quarter of this upward. The technic of preparing the autolysate is described, but attention is called to the fact that supplies will be sent in quantities for use upon request. The precise mechanism of the action of the antigen used here is not understood. The purpose of the autolysis is to reduce the toxicity without impairing the value of the product.

Infected Wounds of the Knee.—K. W. Monsarrat (*British Medical Journal*, March 16, 1918) advocates the following plan of treatment in cases of early infection where the joint has not begun to be disorganized: Excision of the wound or wounds, including those of the capsule and synovial membrane; evacuation of the effusion; removal of foreign bodies and bone fragments; a four inch, transverse incision into the joint a fingerbreadth above the patella; no sutures, or catgut sutures only through the excised wounds of the synovial membrane; no drainage material entering the joint; and fixation on a splint with extension and elevation of the extremity to an angle of 45° at the hip. The transverse incision should be kept open for three or four days by the insertion of a pair of forceps. When the joint wound is complicated by fracture primary resection of the joint may be considered but it is an operation of very limited utility. Secondary amputation is required if signs of active infection continue for the next few days following arthrotomy and it should not be delayed beyond the third day. Amputation is also advisable in cases of infection complicated by serious bone injury, if there is injury to the femoral or popliteal artery, or section of the internal or external popliteal nerves. Of twenty-five cases treated along these lines within four days of the receipt of their wounds, eighteen recovered without amputation, four after amputation, and three died. And of thirteen cases treated after the fourth day four recovered without, and three after amputation and six died. Of the twenty-two cases which recovered without amputation thirteen had partially recovered the functions of the joint when discharged from hospital.

Treatment of Acidosis.—John Howland and W. McKim Marriott (*Pennsylvania Medical Journal*, April, 1918) aim to prevent the production of more acids; to replenish the alkali reserve and to eliminate the acids and their salts. If acetone body acidosis develops, glucose should be given, preferably intravenously, in all cases except those due to diabetes. If given by mouth, a five to ten per cent. solution every two hours in quantities depending upon the age of the child and the tolerance of the gastrointestinal tract. When administered by rectum, a five per cent. solution is to be employed, preferably by the drop method. If given intravenously, a five to ten per cent. solution is employed and seventy-five to 300 c. c. are injected at a time. To replenish, alkali reserve bicarbonate of soda is used. Its administration by rectum or subcutaneously should be avoided. It should be given by mouth or intravenously. By mouth, one to four grams in a watery solution every two hours. If given intravenously, seventy-five to 100 c. c. in young children; in older children up to 300 c. c. Enough should be given to shift the reaction of the urine to normal. A safe rule is to administer soda until the urine takes on a purple color, when a few drops of an alcoholic solution of bromocresol purple are added. Water should be given in as large amounts as can be borne. It may be given per rectum, intravenously, subcutaneously, or intraperitoneally. As much as 300 c. c. may be put into the peritoneum.

The Treatment of Infections and Infected Wounds with Dichloramine-T.—Robert Perry Cummins (*Pennsylvania Medical Journal*, March, 1918) claims the following advantages for this treatment: simplicity of technic; skin irritation will not occur if the wounds are not covered with thick, occlusive dressings; there is a decrease in the amount of exudate; there is also a decrease in days lost by workmen under this treatment, amounting to thirty-five per cent.; it has no effect on knots of catgut ligatures and no disintegrating effect upon catgut itself; it acts as a deodorant.

Dichloramin-T for Ocular Infections.—A. S. Green and L. D. Green (*Journal A. M. A.*, April 27, 1918) emphasize the difficulty, which has been long recognized, of finding a suitable and effective antiseptic for the eye which would destroy the organisms without damaging the delicate ocular tissues. They believe that this has been found in the form of an oily solution of Iakin's dichloramin-T in a strength of 0.5 to one per cent. Three or four drops of this solution can be instilled into the eye hourly without danger to the ocular tissues and with but slight and very transient pain. It has proved most effective from the antiseptic point of view, having rapidly cleared up resistant cases of trachoma, phlyctenular conjunctivitis and other infections.

Chloramine as an Antiseptic in Ophthalmology.—F. de Lapersonne (*Presse médicale*, January 31, 1918) found a 0.5 per cent. solution of sodium hypochlorite too irritating for use as a collyrium. A 0.1 per cent. solution proved bearable in gonococcal conjunctivitis, but the results were no better than those obtained with permanganate solutions. A one per cent. chloramine collyrium was found quite painless. Two or four per cent. solutions caused a temporary stinging sensation—less, however, than with zinc sulphate—and slight conjunctival redness lasting five minutes. An ointment based on agar agar and containing one or two per cent. of chloramine was as well borne as the chloramine collyria. Therapeutically, these preparations proved very active. In two cases of purulent conjunctivitis in the newborn they were used independently of other measures. One case was clearly gonococcal and showed a central ulceration of the cornea which yielded and healed in three days under two per cent. chloramine; in this case silver nitrate had already been used a week. Both cases made rapid progress under the chloramine. In several cases of severe ulceration with hypopyon, the use of a two per cent. ointment morning and evening resulted in healing of the cornea. The chloramine seemed greatly to favor elimination of the necrotic tissues; by the third day the ulcers showed clean bases, ready for epithelial repair. In conjunctival sacs with long standing suppuration from enucleation or severe lid involvements, favorable effects seemed to be produced. Application of chloramine preparations for a week or two made it possible to carry out autoplasmic operations previously not feasible. In conclusion, De Lapersonne regards chloramine as a powerful antiseptic, well borne by the conjunctiva in collyria up to four per cent. and in ointments, if a suitable excipient be selected.

Treatment of Acne Vulgaris.—Warren Brown (*Northwest Medicine*, February, 1918) advises the correction of all factors which tend to impair vitality, such as the excessive use of tobacco, and alcohol, unhygienic living and working conditions, improper ventilation, inadequate bathing, lack of exercise in the open, and the excessive use of sugar, pastries, fats, and proteins. The bowels should be thoroughly opened by blue mass for two or three successive nights, and salts should be given in the morning, and they should be kept open by the use of cascara, agar agar, hot morning drinks, and fruit. Vigorous daily exercise out of doors, and a daily warm bath must be prescribed. Sexual irregularities must be discovered and corrected, and can often be materially helped by corpus luteum or thyroid. Local treatment should include softening of the skin by bathing with warm boric acid solution, followed in the pustular cases by incision of the pustules, expression of their contents, touching the floor of each pustule with a solution of equal parts of iodine, phenol, and camphor or chloral, promotion of free bleeding by further warm bathing, and the application of ammoniated mercury ointment. In the non-pustular cases the skin should be softened by bathing, the outer layer should be made to desquamate slightly by the application of a five per cent. ointment of salicylic acid, and the official sulphur ointment should be applied. For very greasy skins the application of one per cent. iodine in benzine will be found of value. The plan of treatment should be to alternate stimulation with soothing of the skin. For soothing application a well perfumed, bland ointment should be prescribed. Autogenous or stock vaccines may be used, but are not essential.

Radium in Fibroid Tumors.—Howard A. Kelly (*Virginia Medical Semi-Monthly*, April, 1918) states that, taking these cases as they run, handled by the skilled as well as the unskilled surgeon, the risk from operative treatment in them is still considerable. It has been his rule for many years to operate only where there is persistent hemorrhage or pain, where pressure symptoms are acute, or where there is good evidence of a complicating abdominal condition. Between March, 1912, and January, 1918, he has treated, with C. F. Burnam, 211 cases of fibroid by radium. The average age of these patients was forty-three years. Menorrhagia, metrorrhagia, or both were symptoms in 161 cases. Of the 148 cases in Group 1, viz., those forty years of age or over sixty-two have been entirely cured by the treatment, the tumor having either disappeared or dwindled to negligible size; in forty-six the tumor has diminished, while in ten the patients are so well that they have never consented to a further examination. Setting aside cases where data are insufficient, who have died from other causes, or who have had complications, one obtains 120 cases of simple fibroid, in 118 of which radium proved efficient. The sixty-three cases in Group 2—women under forty—were treated, as a rule, with temporary cessation of menstruation in view, or occasionally to reduce menstruation. In twenty-five the tumor nearly or quite disappeared, in sixteen it decreased, and four were well and not reexamined. The treatment consists of a preliminary curettage, the use of

a polyp forceps to remove any peduncular growth, and the insertion of 300 to 500 millicuries of emanation of radium covered with a rubber cot on the end of a sound into the uterus, where it is allowed to remain about three hours. One treatment may suffice, or a second be required after several months. For this an external treatment may be substituted, consisting of radium, suitably filtered, applied over various areas of the abdomen for several hours. The intrauterine treatment is no more painful than the introduction of a sound. The immediate results are nausea for about twenty-four hours and abdominal tenderness for several days. Sometimes there is a leucorrhoeal discharge for a few weeks. In about half the cases no menopausal symptoms are complained of; in about one fourth they are moderate, and in the remaining fourth severe.

Myomectomy or Hysterectomy.—Victor Bonney (*British Medical Journal*, March 9, 1918) makes a strong plea for the increased practice of myomectomy for the removal of uterine fibroids, especially in young women. In order not to miss small submucous fibroids, which may later grow, or may cause continued menorrhagia, the uterus should be opened as a routine. Where there is endometrial thickening, with or without polypoid growths, the uterus should be thoroughly curetted with a sharp curette after opening. Uterine hypertrophy should be reduced by cutting away the redundant capsule of hypertrophied muscle, or removal of a segment of the whole thickness of the uterine wall. Where the uterine wall is found to be fibrosed and degenerated, a hysterectomy should be performed. The practice of myomectomy in the way outlined largely prevents recurrence of the fibroids; does not interfere with possible future pregnancy; conserves the uterus; cures the conditions caused by the fibroids; and does not increase the risk of the operation as compared with hysterectomy.

Nasal and Aural Polypi: Permanent Cure.—Charles Chick (*The Laryngoscope*, March, 1918) states that the cause of nasal and aural polypi is undoubtedly infection, which is facilitated by faulty ventilation and drainage of the nasal fossae. Two factors are invariably present, which render this constant and repeated infection possible and which brings about the interference with ventilation and drainage of the nasal cavities. The first is a deflected nasal septum, frequently of the high acute variety, but it may be of any type, and complicated by an extensive septal ridge. The second factor of vast importance is the invariable presence of diseased tonsils. The author asserts that he has never yet failed to find two diseased tonsils in the throat of every patient who has presented himself for the cure of nasal polypi. The first step in the treatment is to remove with snare and biting forceps all the polypoid tissue within sight. In some cases it is necessary to sacrifice considerable of the middle turbinate body and also to open up and clean out the anterior and posterior ethmoidal cells in order to free these cavities of degenerated tissue. A week or so later both tonsils are enucleated, as this is considered absolutely essential to prevent recurrence and is thought to be the controlling key to all satisfactory nasal fossae work, on the assumption that

the tonsils are the principal means whereby infection at all ages gains entrance to the body. The nasal septum is later straightened by a complete submucous resection.

In the treatment of aural polypi, which are associated with a chronic purulent otitis media, the ear is made as free as possible, the patient instills hydrogen peroxide, follows it with a hot douche, dries the canal with cotton and then uses a few drops of 1-2000 bichloride solution. The complete removal of the tonsils is the next step, which also benefits the chronic catarrhal otitis media which will be found associated with polypi in the ear. All traces of adenoid tissue and bands are removed or destroyed. The bands are the remains of adenoids and will be found extending between the Eustachian tube and the pharyngeal vault. The nasal septum invariably needs straightening and the thickness reduced by a complete submucous resection.

Treatment of Extrauterine Pregnancy.—W. O. Henry (*Southern California Practitioner*, March, 1918) advises opening the abdomen in the early stage before rupture and removing the pregnancy. This may be done per vaginam, but the abdominal route is the safer. When abortion or rupture has occurred there should be no delay. The abdomen should be opened at once, not waiting for the patient to recover from the primary shock. Morphine and atropine should be administered by hypo and ether anesthesia employed. If necessary, hypodermoclysis should be given. The bleeding point should be controlled, the product of conception removed and the blood clots wiped out. The tube and ovary on the affected side are usually removed. There is no necessity for removing both tubes and ovaries.

Clinical Effects of Flavine in Wound Treatment.—William Pearson (*Lancet*, March 9, 1918) investigated the effects of the use of 1:1,000 solution of flavine as an irrigating lotion, wet dressings and gauze packs in the treatment of actively septic wounds and of those in which sepsis had already been controlled. The effects of flavine were compared with those of hydrogen peroxide and warm water, plain sterile gauze, gauze wrung out of normal saline, boric lotion, 1:8,000 biniodide of mercury, and double cyanide gauze. In all respects other than the substitution of flavine for one of the above dressings the treatment of all wounds was alike. Flavine was found to have no influence on the steady and rapid decline of infection following thorough opening and cleaning of the wound and provision of free drainage. It also had no influence on the amount or character of the discharge from infected wounds, or on the rate of formation of granulation tissue. In cases in which repair had already begun, the application of flavine coagulated and toughened separating sloughs and shreds of tissue and materially delayed their separation; it invariably exerted an injurious effect on the granulation tissue, making it pale and gelatinous and covering it with a tough film that appeared to be the result of a coagulation necrosis. From these observations it was concluded that flavine had no beneficial effect in cases of active infection so far as the control of the infection was concerned.

Filiform Drainage in Mammary Abscess.—H. Chaput (*Bulletin de l'Académie de médecine*, January 29, 1918) states that filiform drainage permits of using very small incisions, which can be hidden in the axilla, inframammary sulcus, and areola. The abscess may be first opened by means of two incisions in the areola and filiform drainage instituted through these openings. In the presence of abscess diverticula, further intervention may be required, the first procedure having failed. Drainage by strands passed from areola to axilla, inframammary region, or skin surface is then indicated, according as the abscess is situated above and without, below, or above and within the breast. In instituting areolo-areolar drainage, two radial areolar incisions are made which, if extended, would be tangential to the walls of the abscess; the latter is simultaneously opened. The abscess cavity is explored with markedly curved forceps, and diverticula sought and suitably drained through the areola axilla, inframammary sulcus, or anterior skin surface. When the abscess is unilocular, a strand is looped through the cavity and the two areolar incisions, and tied. Filiform drainage of this type is effectual and only slightly painful; if necessary it can be instituted without anesthesia. The areolar scars are entirely invisible and those of the anterior skin surface are merely punctiform where a Reverdin needle has been used to open the abscess. Unlike broad incisions, filiform drainage is not followed by atrophy of the breast and interruption of mammary secretion.

Treatment of Infected War Wounds with Magnesium Sulphate.—Albert E. Morison (*British Medical Journal*, March 23, 1918) obtains most encouraging results from the use of a cream having the following composition: Dried magnesium sulphate $1\frac{1}{2}$ pounds and glycerite of phenol (ten per cent.) eleven ounces. The glycerite of phenol is placed in a hot mortar and the finely powdered magnesium sulphate is slowly stirred in. The resulting thick cream is very hygroscopic and must be preserved in tightly covered jars. In order to test the efficacy of the cream it was used in a series of badly infected wounds and was applied directly without previous efforts at mechanical cleansing. It was packed into all crevices of the wound, the wound cavity filled, and a thick layer spread over the surface. A dressing of cotton wool and gauze was then applied and the whole left for from three to eight days. Profuse serous discharge occurred often requiring additions to the wool coverings. When the dressings were removed the discharge was thin and seropurulent and the wound was covered with bright red, healthy granulations. The dressing was then renewed once or twice and finally replaced by one of saturated aqueous solutions of magnesium sulphate. The wounds were then closed or grafted. In the case of deep wounds or compound fractures the paste was injected into the wound with a syringe, after free opening and removal of bone fragments or foreign bodies. The cream dressings were easy to apply, produced some analgesia, overcame sepsis and stimulated rapid granulation. Pure glycerin was found quite as suitable as the glycerite of phenol.

Miscellany from Home and Foreign Journals

Cultivation of Globoid Bodies of Poliomyelitis.

—Wilson G. Smillie (*Journal of Experimental Medicine*, March, 1918) believes it may be possible to cultivate globoid bodies from practically all cases from which suitable material is available, providing other conditions are right, such as proper samples of ascitic fluid, strict anaerobiosis for the inoculation tubes, transference at proper intervals, and above all, endless care and perseverance. It is difficult to establish the strain, and Smillie was unable to identify the globoid bodies in the first generation, as the original investigators did. However, organisms identical in morphological and cultural characteristics with the globoid bodies of Flexner and Noguchi were obtained in twenty-two cultures from the tissues of seven monkeys suffering with experimental poliomyelitis. Twenty of the strains were cultivated from the central nervous organs, all but one being from the cerebrum, and this single exception was cultivated from the cervical portion of the spinal cord. Two strains were cultivated from the spleen. This is the first time that the globoid bodies have been reported as being isolated from organs other than those of the central nervous system. It was not possible to produce typical poliomyelitis in monkeys by inoculation with the cultivated strains. The streptococcus played the rôle of a common contaminant, and in no way was there any indication of its being a factor in the pathology of poliomyelitis.

X Ray in Cavity Formation in Pulmonary Tuberculosis.—C. Mantoux and G. Maingot (*Presse médicale*, March 7 1918) point out that the commonly recognized x ray appearance of a lung cavity as a rounded light area in the lung parenchyma is not the only form which such a cavity may assume in x ray examination. Often a cavity exists where a definite light area cannot be perceived. A special type of x ray image, hitherto not described yet very characteristic when one once learns to recognize it, is one presenting, on a rather dark background, an appearance as of a cross section through a loose meshed piece of bread, with its agglomeration of incomplete circular spaces of different sizes, running into one another. During the act of coughing the breadlike area may become displaced and distorted. In some other cases the spaces are all approximately equal in size, regularly disposed, and in part polygonal in outline, presenting what the authors term the honeycomb condition. This appearance, which is met with especially in the upper half of the pulmonary fields, is often overlooked in radioscapy, becoming manifest only on the x ray plate. If the spaces are large, however—usually in the tissues between the hilum and the clavicle—the condition is readily visible in radioscapy. During the act of coughing the honeycomb appearance changes less than either the ordinary large rounded cavity or the breadlike cavity picture. Neither must be confounded either with the reticular appearance sometimes presented by fine bronchial ramifications, the so called marbled appearance with a less definite and regularly rounded outline, or misleading shadows at the hilum, which can be

differentiated by comparison with the hilum of the opposite side. Autopsies always showed losses of lung tissue at the points corresponding to the honeycomb or breadlike areas. Usually there were multiple cavities in different planes of the lung, but in one case with a very definite honeycomb condition there was found a single cavity crossed by a number of bands of fibrous tissue. Whereas the ordinary rounded space appearance is met with in over half the cases of open tuberculosis, the special appearances described were noted in one seventh of 350 such cases. The bread appearance was met with more frequently than the honeycomb. Not a single case among 250 patients with closed or suspected tuberculosis showed either of these conditions. The auscultatory signs confirmed in four fifths of the cases the existence of cavities where one of these conditions was noted.

Tolerance of Physical Exertion in Irritable Heart.—Thomas Lewis (*British Medical Journal*, March 30, 1918) contends that the only sure way of determining the tolerance of exertion in cases of so called irritable heart is by direct testing of the patient upon suitable drills. In other words, the test of capacity for exertion should be the observed reaction to exertion. Certain specified drills are arranged in order of severity and duration, beginning with light exercise for fifteen minutes and increasing to very hard work for thirty minutes. From a few days to a week are spent upon the two light fifteen minute drills and a week on each of the three thirty minute drills. If the case promises well, further hardening may be obtained by continuation of the severest drills for a week or so longer. The drills should be carried out under the guidance of instructors and the men should be examined frequently, immediately after the drills. The examinations should include getting the patient's own account of his symptoms, but no symptom should be given weight unless confirmed by the results of physical examination. Above all, no leading questions should be asked and no symptoms suggested. Breathlessness is one of the chief complaints, and it should be confirmed by the observation of drawn facies, dilatation of the *alae nasi*, activity of the accessory muscles of respiration, and interference with smooth speech. Precordial pain is another common complaint which must be confirmed by the discovery of sensitiveness over the precordial area, of the borders of the pectoral muscles, and even of the left arm, shoulder and root of the neck. This should be elicited by gently placing both hands on the chest symmetrically and noting the facial expression as increasing pressure is made bilaterally. Palpitation should be neglected, except in so far as it may point to a persistent or marked tachycardia. Tachycardia is relative, and the pulse rates must be considered broadly and in the light of the individual responses. Giddiness is a symptom of little prognostic value. Fainting occasionally occurs, but is of no material significance. Its genuineness should be confirmed by the occurrence of a slow heart action. Simulation may be attempted, but can always be detected.

Experimental Acute Nephritis.—Kingo Goto (*Journal of Experimental Medicine*, March, 1918) produced experimental nephritis in dogs by the administration of cantharidin, arsenic, diphtheria toxin, and potassium chromate. The animals showed retention of the nonprotein nitrogen and urea nitrogen, and of the chlorides in the blood, and in addition, acidosis. Some of the dogs showed symptoms analogous to those in patients with uremic coma. Sodium bicarbonate was given by stomach tube, and diminished the acidosis in these types of nephritis. In the milder grades of the disease, the action of the same amounts of poison was variable in different animals.

Allergy and the Respiratory and Circulatory Systems in Relation to the Cause of Death.—Mort D. Pelz and D. E. Jackson (*Journal of Laboratory and Clinical Medicine*, April, 1918), using dogs highly sensitized to egg white and to horse serum, found the liver and abdominal organs were not responsible for anaphylactic shock, as the phenomenon occurred when these organs were removed from the circulation. Upon the injection of the antigen the asphyxia produced by the acute bronchial constriction may account for death. Adrenalin, if given very early, may save the animal, but after the bronchial spasm has thoroughly developed, none of the drugs tried were able to cause dilatation of the bronchioles. Codeine, heroin, and other opium alkaloids produced bronchial and blood pressure changes which closely resemble those of anaphylactic shock.

Toxicity of Eggs.—Linossier (*Bulletin de l'Académie de Médecine*, March 19, 1918) asserts that toxic effects from ingestion of eggs, *e. g.*, diarrhea, nausea, and vomiting, occur only in specially predisposed individuals. The predisposition is often congenital; when acquired, it seems frequently to be the result of some hepatic or intestinal disorder. While assimilated by some to anaphylaxis, the condition should not, for the present at least, be held identical with it. The toxic substance is not one of the definite chemical compounds of which an egg is composed, but is probably a toxalbumin. As it is destroyed by heat, toxic effects in those predisposed can be obviated by having the eggs cooked sufficiently to coagulate all the proteins they contain, including those of the yolk. Despite a prevailing impression to the contrary, a well cooked egg is more easily dissolved by the gastric juice than a raw egg. If it does seem "heavier," this is because it is digested in the stomach, whereas raw protein merely passes through the organ and is not hydrolyzed until it enters the intestine. Prolonged boiling after complete coagulation of the egg is, however, to be avoided, as it tend to slow down the attack of the egg proteins by the gastric juice. With due observance of this precaution, there is no reason why eggs should be forbidden to hepatic patients, though in lithiasis their use should be restricted to avoid increasing the hypercholesterinemia existing in these cases; in such patients but one egg a day should be permitted. Well cooked eggs can likewise be allowed in patients with albuminuria, though in the presence of interstitial nephritis with hypercholesterinemia they should be used but sparingly.

Elimination of Iron and Its Distribution in Liver and Spleen in Experimental Anemia.—Harry Dubin and Richard M. Pearce (*Journal of Experimental Medicine*, April, 1918) produced a chronic anemia in dogs by infecting them with *Trypanosoma equiperdum*, in order to study continuous blood destruction. With animals so treated, there was no increased elimination of iron in the feces, and the storage of iron in the liver and spleen was somewhat greater in amount than in transient experimental anemia. Splenectomy before or after the development of anemia had no influence on the elimination of iron in the feces, nor its storage in the liver. The iron storage was not affected when arsenobenzol was given to retard the trypanosome infection, and thus produce a more chronic form of anemia. This experimental work in dogs did not produce the changes in iron metabolism which are found in some of the chronic hemolytic anemias in man. When a bile duct ureter fistula was made, the figures for iron and bile combined were so near those for urine alone that it appears that iron is not eliminated in the dog in appreciable amounts in the bile. However, in these animals there was an increased storage of iron in the spleen.

Total Blood Volume in Pernicious Anemia.—Edward Lindeman (*Journal A. M. A.*, May 4, 1918) determined the total blood volume in each of a series of ten consecutive cases of pernicious anemia, using a new method recently described by him, and collated these and other findings with the symptoms present in the cases. The blood volumes varied in this series between 1,600 and 4,200 mls, or between 2.4 and five per cent. of the patients' body weights, while the normal probably should be about nine per cent. It was found that, as the volume of the blood was reduced, the severity of the symptoms increased, while restoration of the volume by transfusion of normal whole blood usually gave prompt relief of the symptoms. The studies indicated that the total blood volume was always reduced in pernicious anemia, and that when the reduction was slight, the symptoms, except those referable to the central nervous system, were relatively few and mild even in the face of a marked anemia. The treatment of pernicious anemia should therefore aim at restoration of blood volume as one of its essential features. This should be brought about by transfusion for prompt effects and by the prescription of an abundant fluid diet containing two quarts of milk daily. Milk should be forced even in the presence of an aversion to food, and as the restoration of the blood volume is accomplished the appetite will be found to return. These measures cannot be said to be curative of the disease, and one should not be too hopeful of apparently favorable results from any form of treatment, for the disease has been known to recur after as long as seventeen years. Nevertheless, some of the patients included in the present series would seem, at the present, to have been cured, or to give promise of cure. The interesting observation was made in one case that an angina pectoris developed when the blood volume was very low and disappeared upon its being raised by transfusion.

Relation of Circulating Antibodies to Serum Disease.—Warfield T. Longcope and Francis M. Rackemann (*Journal of Experimental Medicine*, March, 1918) in this work made observations at short intervals before, during, and after serum disease, studying the curves of precipitin formation in fourteen cases, the development of anaphylactin in fifteen, and the appearance of the skin reaction in fifteen. They found that precipitins and anaphylactic antibodies were much more likely to be found in the blood serum of patients who suffered from serum disease following the injections of horse serum than in patients who escaped the disease. In the latter case precipitins and anaphylactic antibodies were not observed. The skin reaction was seen regardless of the amount of serum given or the method of administration and appeared whether or not serum disease developed. The appearance of anaphylactin and precipitin shortly precedes recovery from the disease. The authors believe that serum sickness is essentially dependent on a reaction which takes place within the cells of the body and is probably dependent upon the formation of a toxic substance within these cells. Following the violent cellular reaction, antibodies for horse serum are first slowly and then rapidly extruded into the circulation in great concentration. With the increase in the antibodies the antigen rapidly disappears, and with this reversal of the antibody antigen content of the serum, the sickness abates and the patient improves.

Torpid Inflammatory Reactions in Cancellous Bone Tissue.—De Gaulejac and Nathan (*Presse médicale*, February 21, 1918) note that wounds of spongy bone tissue by war missiles are accompanied by remote lesions with bloody infiltration. These lesions very frequently become the seat of inflammatory reaction, which is grave and obstinate because of the extent of tissues involved. Symptoms may be absent for weeks. Slight pain at the point of entrance of the projectile is alone present to suggest a slight tissue reaction. While the temperature remains practically normal, the pulse exhibits a range of from eighty to one hundred, and is a more precise indication of latent infection than thermometric readings. The second stage occurs after the wound has completely healed and is marked by a secondary, subacute osteoarthritis. Many of the joint disturbances following wounds of the articulations, and the origin of which is as yet obscure, are probably the result of an extending osteitis that has started from the focus of confusion. Under such circumstances, excision of the contused and infected osseous lesion completely overcomes the difficulty. In over one fourth of all cases these bone lesions are accompanied by a true septicemia, demonstrable by blood culture. This occurs especially where the missile has been retained, and disappears with its removal. There is, however, no violent constitutional reaction. The course of the infection varies greatly in different cases. It is manifest promptly, and runs a subacute course where there is an open wound. When the wound is closed, it runs a chronic course. The pathological change taking place is a dry necrosis of the spongy tissue, with decalcification as its predominating feature.

X Ray Appearances of Trichiniasis.—Claude Goulesbrough (*Lancet*, March 30, 1918) calls attention to the fact that after sufficient time had elapsed from the initial stages of trichiniasis to permit of calcification of the trichinae the use of the x ray permits the making of a positive diagnosis with ease. The calcified lesions show up in the plates as small ovoid discs of various sizes, located in the muscles and definitely not attached to bone. In some of the areas the centres of the discs show clear. Such findings may occur as early as three months after the acute attack, but usually a period nearer to six months is required for calcification.

Malignant Disease after Injury.—W. S. Lazarus-Barlow (*British Medical Journal*, March 30, 1918) refers to the common belief that malignant disease is likely to develop following injury, and points out that, in face of the enormous number of injuries being sustained in the war, fear of the occurrence of carcinoma or sarcoma may arise. So far as squamous celled carcinoma of the skin is concerned this fear can be set at rest, for an analysis of over 10,000 records of malignant disease show that there were less than one per cent. of cases of cancer of the trunk or extremities and that among these only a very small proportion was associated with cicatrices. Sarcoma was found to make up only about nine per cent. of all cases of malignant disease and the direct association of the disease with injury was very uncommon. The probability of a given soldier's developing malignant disease as a result of his injuries was, therefore, very slight.

Reflex Effects of Ocular Compression.—Achard and Binet (*Paris médicale*, March 23, 1918) point out that pressure on the eyeball acts not only on the heart—as in the well known oculocardiac test, but also shows the rate of respiration, in the dog even to the point of apnea. Plethysmographic studies showed that it reduces the capillary pulse. In subjects with a trephine opening, diminution of the pulsations of the cerebral vessels by it is demonstrable. Chills are attenuated by ocular compression, as are also certain tremors, in particular that of exophthalmic goitre. In the latter condition the lessening of the tremor was even observed to persist for a time after cessation of pressure on the eyeball. Thus, in addition to the oculocardiac reflex, there occur also oculorespiratory, oculovascular, and oculomotor reflexes.

Trophic Disturbances in Gunshot Injuries of Peripheral Nerves.—John S. B. Stopford (*Lancet*, March 30, 1918) concludes from a study of the manifestations of trophic disturbance and the examination of an amputated leg in a case of recent gunshot injury of the nerves that many of the changes in the tissues are due to a reduction in the blood supply of the part. This reduction in blood supply comes from an endarterial alteration which, in turn, is due to the irritative nerve lesion. Similar instances of endarteritis have been recorded in cases of peripheral neuritis from other causes. The diminution in blood supply is limited to those parts supplied by arteries innervated from the affected nerve. The results of such reduction in blood supply are seen in muscular contracture, decalcification of bone, and various skin disturbances including glossiness and ulceration.

Proceedings of National and Local Societies

NEW YORK ACADEMY OF MEDICINE.

Stated Meeting Held May 16, 1918.

SECTION IN WAR SURGERY.

The President, DR. WALTER B. JAMES, in the Chair.

Surgery and Actual Surgical Conditions at the Front.—DR. WALTER B. JAMES, in introducing the speaker of the evening, said that throughout the year many of the meetings of the Academy of Medicine had been devoted to subjects connected with the war, for all realized that in these days, every industry, every activity of the men and women of the country was devoted to a single purpose. In the same measure that industry going on in times of peace was the backbone of the commercial status of the country and in time of war became an influence to maintain it, so the scientific work of the country, so necessary in times of peace, must be maintained in time of war to the proper point in order that it too may contribute its quota. So, in addition to the regular war meetings, there had been meetings of the usual scientific kind in which it was shown that the standard of American scientific medicine in its contribution toward the efficiency of the country in war was being kept up. But, tonight, at the last meeting of the season, it seemed proper to make it purely a war meeting, and Major Charles L. Gibson, of the Medical Reserve Corps, who had had a great deal of experience at the front, had been asked to give an informal talk with a view to enlightening the members as to how surgical work was being done at the front.

Major CHARLES L. GIBSON, M. D., M. R. C., who went to France in August, 1917, at the head of the New York Hospital unit, gave a *résumé* of his experiences and observations abroad. On his previous visits to France and Belgium he had been greatly impressed with the need for base hospitals with trained personnel, and he welcomed a suggestion from the Sugeron General's office to form an organization and go over there where helping to care for the wounded would be so effective. The project was somewhat delayed at first as it was necessary for the base hospital units to finance themselves, but the aid of friends of the New York Hospital was enlisted and, finally, after two weeks spent at Governor's Island, they embarked on a transport, in a convoy of four others escorted by torpedo boats and destroyers, and the goal was at last in sight. On the voyage over there were discomforts incidental to the utilization of every inch of space so as to carry as many persons as possible, but, as it was summer, and the weather was delightful, sleeping on deck was possible and minor annoyances were forgotten. They experienced a submarine scare, a fusillade of shots being poured out over the water and a rumor gained current that one of the underseas craft had been sunk, but later it was learned that on the official log was the entry that nothing had been sighted. This was probably on a par with many of the tales of submarines that were current from time to time. After fifteen days at sea a landing was made and the unit was

assigned to a place in the central part of France. They inherited the location of a former insane asylum that had later been a training camp and a great deal had to be done to get the place in order for a hospital, water supply, plumbing, etc., being very inadequate. After some months patients began to come in from neighboring organizations nearer the front.

There had been a number of opportunities, at different times for several members of the units to make some observations of what was going on in the different hospitals. Three of these young men happened to be detailed to the French aviation hospital at Amiens just after the French drove back the Germans. All of the staff, in teams of two, got two weeks at the British front, and the speaker had never before come into such close contact with war and in actual care of the wounded. It was a casualty clearing station, commonly called a C. C. S., five miles from the front, and it provided for the care of the wounded very efficiently as close to the front as it was possible to get. These casualty clearing stations were always in pairs. Each hospital had 200 beds, surgeons, assistants, anesthetist, medical men and radiographer. The personnel was increased in time of strife. The wards were made up of tents, dry, heated, and well put up, and there were a few portable huts. They could be taken down, transported and set up again in forty-eight hours. They were comfortable and very cheerful places.

It was at the casualty clearing station that the first systematic treatment of the wounded began. If properly done this was often all that the man required. Hurt in the trenches, he got first aid right there from attending surgeons, some of whom were always there to attend the wounded in the dugout back of regimental headquarters. If the soldier could walk, he walked back, but if not, he was carried. From the dugout he went to a main dressing station at the nearest point to which vehicles could be taken. These dressing stations were under canvas and they were often bombed; nevertheless surgeons and nurses stayed there awaiting the consignments of wounded to whom they gave a little more formal care and the first dose of tetanus antitoxin. The British plan was to give four doses one week apart. Before being taken onward, the wounded man was given plenty of morphia, a dose of a half to a grain being administered. There were no disadvantages resulting from this and it saved much shock during transportation. He was then put in a motor ambulance, and too much could not be said in praise of the high quality of these British ambulances; they were first class, and rarely, if ever, broke down. They were thoroughly warmed and the doors kept closed, except when taking on or discharging a load, for the British had a theory that the conservation of bodily heat was an antidote to shock and every precaution was taken to maintain it.

The patient was brought to the C. C. S. and taken to a hut the entrance to which was by double doors and the two sets of doors were never open at the

same time. There was conservation of bodily heat on all occasions. The man stayed in this hut only long enough to go through the clerical formalities, a form expedited by the fact that all soldiers carry with them a card containing their personal data, and this card never left them until they went home again to England. The patient then passed through some more double doors into the examining room. There he was given a thorough examination and the disposition of his case decided upon. Upon the decision of the examining physician, who was not necessarily a surgeon, and in fact at this particular C. C. S., was a medical man and a very keen diagnostician, depended the patient's future happiness and comfort. A large number of cases brought in were minor ones and these were disposed of by a special staff and in a special room. Then the patient was radiographed and upon the findings operative procedure was based, for of course there was a certain group that required operation. But it sometimes happened that the man was so shocked that to give him an anesthetic would have killed him, so he was sent to a special department where he was literally brought back to life. Various means were used but the greatest reliance was on heat. As soon as he was considered in good shape to undergo operation he was sent to the operating amphitheatre, but before this he was sent into another hut where he was cleaned up. The sicker he was the less cleansing he received, for it was not considered wise to handle them very much, turning or lifting them, for they could not well endure it. In this hut the man got a little nourishment. Those soldiers who had been lying out wounded for hours did not complain of hunger, but they had a fearful thirst. Some of those who had been brought in seemed absolutely dehydrated. In the British C. C. S. they were given hot tea.

In the operating amphitheatre there were six or eight tables and a corresponding number of teams who usually worked sixteen hours out of the twenty-four, but in times of strafe there was no regard for hours and the work was very hard indeed. If there was a surgeon with a particularly high reputation for a certain class of cases, such a man was given most of these cases. Cushing had increased his splendid reputation for head work in this war and a great deal of it was assigned to him.

Ether was the leader in anesthetics, but there was a relatively large amount of local anesthesia for which novocaine was used. The work in this C. C. S. was a revelation to the speaker regarding the possibilities of local anesthesia. The disinfection was done with soap and water and, instead of iodine, they used picric acid, a five per cent. solution in alcohol. This was cheaper than iodine and absolutely non-irritating. The operative treatment aimed at the radical removal of every particle of damaged or infiltrated tissue, in fact all tissue that seemed suspicious. If the patient arrived under treatment early enough (and the aim was to accomplish this within eight hours), and the operation was carefully done, this was a sure guarantee of prophylaxis against infection, especially gas gangrene. Gas gangrene had been largely done away with; it hardly ever developed in patients who came under treatment early, but some of them could not be

brought in soon enough, and so there were still some cases. The wound was widened, all discolored or infiltrated muscle cut out, then swabbed out with some form of antiseptic, usually ether, left wide open and packed with paraffine oil containing one per cent. iodoform and the patient sent back to a ward. It was the aim to keep the head, chest, and abdomen cases for one week, but the other cases were sent back to the base the next day. At the base hospital this packing was removed within five to ten days and the wound was generally in such condition as to lend itself to closure by suture, thereafter healing promptly. The French had more elaborate bacteriological procedures than the British. They took a smear of the wound which was left open as long as they were doubtful of the possibilities. This treatment by the British had replaced the necessity for the Carrel method of disinfection, but it was to the everlasting credit of Carrel that he was among the first to recognize that no volume of antiseptics would ever heal these wounds without careful surgical technic and that contused and infiltrated tissue should be removed.

There had been a remarkable improvement in the record of fractures. In the beginning of the war the mortality, especially in fractures of the thigh, was very high, but this had been lowered enormously by making provision for immobilization of the joints during transportation. The British and French had adapted the Thomas apparatus for immobilization of the joints in tuberculosis; they had found this the best way to immobilize these war fractures during transportation and the influence of this over shock was extraordinary. An adaptation of the Thomas splint was devised for arm and shoulder joint wounds; since it ordinarily held the arm in extension, it was provided with a swivel joint which made it more practical to load the man on a train or in an ambulance.

The treatment of penetrating wounds of the lungs had improved vastly. Duval believed one should operate on gunshot wounds of the lungs as one would anywhere else. One very striking demonstration had been seen in explanation of a method of operating for foreign body in the lung; it was done under a screen. A fluoroscope was over the patient's body and the surgeon's hands under it made an incision in the chest, bored through, seized the foreign body and withdrew it. Three cases were operated upon in an hour and 250 within two or three days with only one fatality. This was only one of the many resources of the French; they used vibrators, telephone probes and electrodes, and many things that were practically unknown in this country but which had been described in a book by Ombredanne, and Ledoux-Lebard, the x ray man of Gosset, of whose volume there was at present no translation. But there was really only one way to learn and that was to go to the field and personally observe the work being done there.

A Present Help in Time of Trouble.—The first number of a *Review of War Surgery and Medicine* was issued from the office of the Surgeon General of the United States Army in March, 1918. It appears monthly, and is devoted to abstracts of medical literature relating to the war.

MEDICAL ASSOCIATION OF THE GREATER CITY OF NEW YORK.

Stated Meeting, Held December 17, 1917.

The President, DR. THOMAS S. SOUTHWORTH, in the Chair.

Vaccine Therapy in Chronic Intestinal Toxemia.—Dr. GEORGE REESE SATTERLEE read a paper on the subject, which was published in the NEW YORK MEDICAL JOURNAL, May 25, 1918.

Doctor SOUTHWORTH in opening the discussion said: Vaccine therapy had passed into the third of the stages which often follow each other in the course of new therapeutic procedures: the first stage was that of great enthusiasm and unreasonable expectations for general applicability; the second, that of a modified disappointment of high hopes because the applicability has not proved as general as was expected; the third was where these real achievements began to be more fully recognized; positions were consolidated, and with better technic in expert hands the work is extended into other lines.

Dr. J. W. DRAPER told that together with Satterlee and Lynch he had worked on this interesting problem for a number of years. In the beginning each had traveled a somewhat different course but it was interesting to see how their results converged as the scientific and clinical sides of the work developed. His own work had been concerned chiefly with the cause of death in duodenal obstruction, experiments having been done on dogs. Briefly he had proved that acute duodenal obstructions resulted in the peculiar and characteristic clinical syndrome which ended in death usually within 100 hours. It bore many interesting resemblances to that resulting from parathyroidectomy. It was now generally accepted that these early experiments had been correctly interpreted as proving that neither bacteria nor decomposition of food in the gut contributed to the cause of death. It was interesting that the most recent researches upon this most important subject had given additional strength to this early conclusion, and he cited the recent researches of Whipple, who, working in the Johns Hopkins laboratories had found evidence for believing that a proteose was the immediate cause of death. Whatever the ultimate nature of the poison might prove to be it was in the speaker's opinion undoubtedly produced either directly or indirectly by the duodenal epithelium and that it was undoubtedly of a delicate biochemical nature and too unstable to be easily isolated.

Howard Barber's research had proved the close and significant relationship, neuromuscular in type, between the duodenum and the terminal ileum. Partial ileac obstructions produce dilatation while complete obstructions produce constriction of the duodenum.

Thus experimentation had proved a close clinical relationship between pathological conditions of the two ends of the canal. While Doctor Satterlee had regarded many of the symptoms of colonic toxemia, as taking their origin in bacillus coli perversions he had always been particular, as in this paper, to regard the alimentary tract as a whole. Therefore, and particularly because of Barber's studies, it was

easy to see that definite right sided colonic lesions, while permitting the free absorption of bacterial toxins might also indirectly cause locally through neuromuscular channels partial duodenal obstructions, the synchronous absorption of the biochemical nonbacterial poisons already referred to as originating in the duodenal epithelium. The speaker and Doctor Lynch had removed the right side of the colon in thirty-one human derelicts and had been interested in observing the striking improvements which had occurred in many of these individuals during the past three years. This operation had been designated developmental reconstruction because it reconstructed the adult human colon to the so called second position which is characteristic of certain mammals, notably the dog. It was based upon the known fact that the left side of the colon being of great stability embryologically, and of extreme antiquity, is far more important to human beings than the right side which is a relatively recent acquisition, and which, as was well known, did not complete its growth until the first year of extrauterine life. Like the wisdom tooth, it was therefore unstable and shared with its vermiform appendix an inherent tendency to degenerate. The speaker concluded by saying that in his opinion, and in the light of extensive animal researches and wide human clinical studies, Satterlee's investigations of the atypical colon were of the utmost importance, because, quite aside from their individual merits, they had stimulated the work and researches of others.

Dr. ERNEST E. SMITH remarked that he was inclined to make a rather sharp differentiation between organic intestinal toxemias on the one hand, and chronic intestinal infections on the other. In certain cases the condition is really a toxemia and in others it was really an invasion of the tissue by bacteria, and therefore might be classed as an infection. This was an important point in connection with vaccine therapy, for where there is chronic intestinal toxemia without invasion of bacteria, the vaccine therapy was useless.

In any toxemia we were dealing with the action of decomposition products, especially the protein decomposition products of bacterial origin, which products are absorbed and partook of the action of some of the hormones—not merely the hormones of the alimentary region, but also the hormones of the more distant parts of the body—so that the balance between the activity of the various products of the endocrine glands, etc.—the balance of the pharmacological action of the normal constituents of the body—was upset, and in these cases the chronic intestinal toxemia gave rise to many of the nervous symptoms.

A well recognized writer recently suggested that possibly these products—because they resemble the hormones in their reactions—were benefactors of the body and had a good effect, and therefore the influence of their production in the body was good. Doctor Smith said that his sense of physiology taught him that in all probability such a view was wrong—that the action is one of disturbance of balance, and brings around a pathological condition. So then, on account of the difference between the chronic intestinal toxemia on the one

hand, and the invasion of bacteria on the other, he believed it to be very important to differentiate between the two conditions. Where there was absolute evidence of bacterial invasion, and a *B. coli* pyelitis or *B. coli* in the sputum, or perhaps in arthritic cases, where there was colonic evidence at least of bacterial invasion—if other foci are eliminated, and we are led to consider the intestines as the seat of the invasion, then we had a class of cases belonging to the chronic intestinal infections; and such conditions might not be accompanied by any evidence of actual toxemia. On the other hand, it might be accompanied by evidences of putrefaction, and where such evidences are present, then we had not only an infection, but also a toxemia.

Dr. W. W. ELDRIDGE, responding for Doctor Satterlee, said that if he understood Doctor Smith correctly, both he and Satterlee were considering the subject from almost the same point of view, and, though using a somewhat different nomenclature, were reaching the same conclusion. Satterlee made a differentiation between a chronic intestinal toxemia of bacterial origin and a toxemia from the absorption of products of putrefaction, instead of using the terms "bacterial invasion" and putrefactive absorption. As regarded indicanuria, our experience had been that, in a large majority of chronic intestinal cases, no indicanuria was shown, and the autogenous colon bacillus vaccine was used as a diagnostic measure. The cases which had shown no indicanuria would often give a severe reaction, and where indican was in the urine there was often no reaction. Indican in the urine had not proven of much value in diagnosis. One interesting point had been noticed. In making up the autogenous vaccines one was occasionally found very difficult to sterilize, and we might have to go through the sterilizing process two or three times to get sterility. The reactions from these vaccines were sometimes alarmingly severe, and the vaccine had to be discontinued, whereas in cases in which there was no difficulty in sterilizing the vaccine, the reactions were usually rather mild. Doctor Satterlee had desired him to make it clear that the vaccines were made from cultures taken from the caecal contents, and not from the ordinary stool passed in routine from the rectum.

Dr. ROBERT T. MORRIS said he would like to have one or two points cleared up. Doctor Eldridge had said that one effect of the vaccine was to cause a sensitization. At present he himself was working on the question of the relation of a variety of toxic impressions and insanities. When asked why it was that one patient is insane in the presence of a toxic condition, and another patient with the same kind of toxic condition not so, his reply had been that the insane patient was a sensitized person; the allergic processes would account for the conditions in that particular case. Now, according to Satterlee and Eldridge, the vaccine also causes a sensitization. It would seem in that case that there must be a further philosophy in explanation for its favorable action. If we do have an allergic process as the result of vaccination, then it would seem we would have to reduce the sensitization by means of frequently repeated small doses. That might make the patient less responsible, and we might cure some

of the insanities by frequently repeated doses of the vaccine. It would be interesting to have this point cleared up.

We had not yet given sufficient attention to the subject of the relation between toxic impressions and insanities, but did find many insane patients have these toxemias. Doctor Morris said he did not believe that insanity is caused by a toxin, but did feel that in certain susceptible patients the insanity might have been precipitated by the toxin, and if that precipitating factor was removed the patient might become well. Doctor Morris said he has several psychotic and psychoneurotic patients who had been under restraint, but were now practically well, but he had been working along surgical lines.

Another important point: Doctor Draper emphasized that some of the toxic influences were not directly bacterial, particularly those relating to the upper part of the bowel. We had an entire group of bacteria which might not furnish toxic influence excepting through excretions of their byproducts through elective affinity at the pylorus. Many cases of stomach or duodenal ulcer were relieved if we relieved a tonsillar or tooth root infection; yet the very next patient, with worse tonsillar or tooth conditions might make no response whatever. A sensitized patient on the other hand who was excreting toxins in the upper part of the enteron, particularly of the pylorus, might sometimes have an ulcer cured without any operation. In such cases the ulcerative process was due to the excretion of toxins by elective affinity in that region. There might be no bacteria present in that duodenum, and yet a very positive toxemia, due to streptococcus viridens, acting from a distance—not local bacterial influence.

Dr. ANTHONY BASSLER questioned whether it was fair to make the statement that the presence or absence of certain bacteria was of no importance in connection with the diagnosis of intestinal toxemia. It would seem that if one observed the subject from a pathological standpoint, studied the symbiosis, and made careful bacteriological studies, he was not warranted in coming to that conclusion. All these toxic colons had essentially the same pathology; they were usually right sided; there was generally more or less dilatation, with an absence of the tubular glands at the ileocecal valve; and it was not until one gets to the hepatic flexure that the glands appear. That was the pathology of all when there were constitutional symptoms of toxemia. Many theories had been advanced, all more or less bound up together. None were altogether right and none were altogether wrong.

In those cases one must take into consideration the life of the individual, age, habits, etc.; the bacteriology of the intestinal canal as it could be favorably influenced by various diets; the bacteriology of the canal independent of what foods were eaten, the secretions of the stomach, those poured into the intestine, the factor of stasis, its causes. Was the toxemia secondary or primary? Whether the toxemia was an independent primary one, or whether removal of a cause or complications will cure the toxemia?

Doctor Bassler said he would like to make one suggestion to Doctor Eldridge regarding the ab-

sence of benefit in the streptococcus infection from vaccine therapy. One could favorably influence these cases by the use of emetine during and for a considerable time afterward. In his opinion intestinal toxemia from the bacteriological standpoint was a much more complex problem than the use of coli vaccines alone. His work in the subject had taught him that, while in about half of the cases such vaccines would be of assistance, in the other half the vaccines of the many other organisms were necessary. To use coli vaccines alone for all intestinal toxemia cases, considering the vast differences that there was among them, was like using a single drug for all diseases and conditions of a single organ.

Book Reviews.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

A Treatise on Orthopedic Surgery. By ROYAL WHITMAN, M.D., M.R.C.S., F.A.C.S., Assistant Professor of Orthopedic Surgery in the College of Physicians and Surgeons of Columbia University, New York; Professor of Orthopedic Surgery in the New York Polyclinic Medical School and Hospital; Associate Surgeon to the Hospital for Ruptured and Crippled, etc. Fifth Edition, Revised and Enlarged. Illustrated with Seven Hundred and Four Engravings. New York and Philadelphia: Lea & Febiger, 1917. Pp. xii-906. (Price \$6.50.)

This work has already reached its fifth edition upon its own merit, so needs no helping hand to fame. It is based on the writer's extensive clinical experience, and the subject of orthopedic surgery in this edition has been presented in the light of the most recent investigations. The volume has been particularly revised as to anterior poliomyelitis and enlarged by studies of the recent epidemic. The many illustrations and statistical data make the text the more acceptable. This latest revision of Whitman's work expresses the last word on the subject of orthopedic surgery, and the book should have a wide circulation among students in particular and practitioners in general.

Clinical Surgical Diagnosis for Students and Practitioners. By F. DE QUERVIAN, Professor of Surgery and Director of the Surgical Clinic at the University of Basle. With Six Hundred and Four Illustrations and Five Plates. Second English Edition. Translated from the Fifth Edition by J. SNOWMAN, M.D. New York: William Wood & Company, 1917. Pp. xix-841. (Price \$10.)

This volume of de Quervian's surgical diagnosis, based on the fifth edition, is worthy of a translation into English, this being the second English edition. The writer's system of diagnosis is mainly by exclusion; that is, the various symptoms and findings of allied conditions are given instead of describing the surgical condition in question, and by the elimination of different symptoms and findings the diagnosis is reached. The work is divided into seven parts. The volume is profusely illustrated, to show the various points in differential diagnosis, further diagnostic aids being diagrammatically shown by colored plates. The chapter on x ray is exceptionally well illustrated, and so are the many orthopedic deformities. The section on surgical diseases of the abdominal and pelvic viscera is unusually illuminating, and the diagnosis of conditions in the upper abdomen is based on the most recent advances in clinical experience and radiological research. This section alone should be in the hands of every one doing abdominal surgery. The last chapter of the book is devoted to problems connected with military surgery of the limbs. The surgical diagnosis includes not only clinical observations, but bacteriological, serological, and radiographic investigations, making a

volume unquestionably one of the most valuable translations that has appeared in English on the subject of surgical diagnosis for many years.

Handbook of Operative Surgery. By WILLIAM IRELAND DE C. WHEELER (Mod.), B.A., M.D. (Dub. Univ.), F.R.C.S.I., Lieutenant Colonel, R.A.M.C., Surgeon to Mercer's Hospital, Member of Council, Royal College of Surgeons, Ireland; Surgeon to the Military Orthopedic Centre, Blackrock, and Honorable Surgeon to the Forces in Ireland. With an introduction by Surgeon General Sir ALFRED KEOGH, G.C.B. Third Edition. New York: William Wood & Co., 1918. Pp. viii-364. (Price \$3.50.)

The author has presented a concise review of the various well known operative procedures, which are profusely illustrated by drawings and diagrams. It seems as if the writer has spent considerably more space than is justifiable upon the ligations of arteries and many of the now obsolete abdominal procedures. He has injected into his work many of his own operations, at the expense of many practical and up to date surgical methods. One is impressed throughout with the usual textbook methods that are employed in a work of this sort. Nevertheless, it is a book from which the medical student could get a good working knowledge of the various operative procedures and technic.

Localization et extraction des projectiles. Par L. OMBRENNEN, chirurgien des hôpitaux professeur agrégé à la faculté de Paris, et R. LEDOUX-LEBARD, chef de laboratoire de radiologie des hôpitaux de Paris. Deuxième édition remantée. (Collection horizon précis de médecine et de chirurgie de guerre.) Paris: Masson et Cie, 1918. Pp. iv-305. (Prix 4 fr.)

In this small, paper covered edition the writers have given the fruit of their experience in the localization and extraction of projectiles. It is not essentially a volume on war surgery, although the methods which they employ are the result of experimental studies on the battlefield. The methods which they employ are unique and practical, and it would pay those who are interested in this part of the x ray field to obtain the authors' views on this all important subject.

Births, Marriages, and Deaths.

Died.

- BROWN.—In Everett, Mass., on Monday, May 13th, Dr. Orestes Morton Brown, aged sixty-two years.
CLEBORNE.—In Savannah, Ga., on Monday, May 13th, Dr. Alan B. Cleborne, Acting Assistant Surgeon, United States Public Health Service, aged thirty-nine years.
CURLIN.—In Hickman, Ky., on Saturday, May 18th, Dr. Prather Buchanan Curlin, aged thirty-eight years.
DAVIES.—In Pasadena, Cal., on Monday, May 13th, Dr. David Charles Davies, aged eighty-four years.
DEMAREST.—In Suffern, N. Y., on Thursday, May 9th, Dr. Sylvester Demarest, aged fifty-six years.
DRAKE.—In Bolivar, Mo., on Sunday, May 19th, Dr. William G. Drake, aged seventy-three years.
GAINES.—In Covington, Ohio, on Saturday, May 11th, Dr. Charles E. Gaines, aged fifty-eight years.
GIBBES.—In Frogmore, S. C., on Tuesday, May 14th, Dr. William Percy Gibbes, aged sixty-four years.
GOODELL.—In Philadelphia, Pa., on Wednesday May 15th, Dr. William Constantine Goodell, aged fifty-five years.
HEADING.—In Philadelphia, Pa., on Monday, May 13th, Dr. James Glasgow Heading, of Port Royal, Pa., aged fifty-eight years.
HEPBURN.—In New York, on Wednesday, May 29th, Dr. Neil J. Hepburn, aged seventy-one years.
JENKINS.—In Allentown, Pa., on Saturday, May 11th, Dr. William Selman Jenkins, aged fifty-six years.
PORTEOUS.—In Minneapolis, Minn., on Wednesday, May 15th, Dr. William M. Porteous, aged sixty-two years.
PRATT.—In Chicago, Ill., on Wednesday, May 15th, Dr. Irene Robinson Pratt, aged fifty-four years.
VAN HOUTEN.—In New York, on Monday, May 27th, Dr. Nicholas Van Houten, aged seventy-six years.
WALLS.—In Richmond, Ind., on Sunday, May 12th, Dr. John A. Walls, aged sixty-nine years.

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Original Communications

THE SURGERY OF LARYNGEAL
MALIGNANCY.

BY HUBERT ARROWSMITH, M. D., F. A. C. S.
Brooklyn, N. Y.

The time is ripe, I believe, for a general readjustment of our rather academic attitude regarding the various procedures employed in the surgery of laryngeal malignancy and for a fusion of views and practice which may obliterate the lines of cleavage between the thyrotomists, the laryngectomists and the "standpaters," in which class we may include those who, when the diagnosis of cancer has been established, confine their efforts to symptomatic treatment, with, perhaps, as a concession to surgery, a tracheotomy in the terminal stage.

The very laudable effort of most statisticians in this field has been to reach some conclusion by which surgery for laryngeal cancer might be standardized. Such a hope is, on the face of it, chimerical. We owe to these investigators a great debt for their painstaking devotion to this task; yet their researches have only demonstrated that no reliance can be placed on conglomerate statistics, and that the indiscriminating lumping together of numbers has only succeeded in befogging the issue.

Moreover, it is eminently unfair to group together all laryngectomies since the time of Billroth's original venture in 1873, or the early thyrotomies, with the improved procedure of later years, and attempt to strike an average. Delexan's summary, presented to this association in 1900, as to thyrotomy, partial laryngectomy, and complete laryngectomy, was the first rational and logical analysis of the work of the then great masters of laryngeal surgery, who in their reports were not seeking to exploit themselves, who were willing to publish "all their material—good and bad" in the most minute detail, to the end that some definite conclusions might be reached concerning the operative demands of various stages of the disease.

A condensed recapitulation of Delevan's classic is in order :

Thyrotomy by ε operators

Preoperative cases	Postoperative deaths (%)	Recurrences (%)	Relative to controls (%)
Deaths (%)	1.2	1.2	1.2

Partial laryngectomy by 8 operators
50 cases Postoperative deaths: 0 Recurrences: 20 Relative rec. very 27

Total laryngectomy by 6 operators
34 cases Postoperative deaths 0 Recurrences 12 Relative recovery 12

Deaths from intercurrent diseases 160

*Read at the Fortieth Annual Congress of the American Entomological Association, Jubilee Celebration, May 18, 1918.

Such intimate statements are informative and extremely useful to the news reporter, very much more than most.

Let me illustrate in a concrete way the ever changing value of totals at different epochs—the following being those of two of the world's most distinguished operators, Linlin and Glinka. Both reports were made, in 1890, at the International Medical Congress in Berlin (1). Glinka's was published twenty three years later—in 1913 (2).

BUTLIN 1890	GLUCK 1913
All cases of operation for in- tracranial aneurysm in the	302 personal observations of an- eurysms of the brain, 1898-1912 144 aneurysms of the brain of the

THYROTOMY

1. *occurrence?*
2. *recurrence?*
3. *cancer of transverse colon in*
4. *2 1/2 years.*

Five recovered and were well at

TOTAL LARYNGECTOMY

1. Age _____

2. Sex _____

3. Marital Status _____

4. Occupation _____

5. Education _____

6. Religion _____

7. Political Party _____

8. Other _____

9. Signature _____

10. Date _____

It is obviously no insult to either Clark's record by adding it to Butlin's, and averaging the total, as to depress our nation's reputation and that of the other operators.

all the common things they have failed in their attempts to properly face down beyond an cavil, by the progressive improvement in the record results of surgery as the amount of the incision that is made surgically increases with work in this field and, finally, these attention to early

diagnosis, by betterment of our operative and especially of our postoperative technic, by a discriminating selection of procedure to fit the individual patient, be convinced that we shall, if not cure, at least very greatly lessen the fatalities from this dread disease.

One of our most distinguished members not very long ago was the author of an article unfortunately entitled "Thyrotomy *versus* Laryngectomy" (the

be sufficient; then we might count on almost actual anatomical cures. This is, of course, utopian, but we cannot entirely ignore Fraenkel's series of five cures out of nine patients by intralaryngeal removal (3). One of his patients was well at thirteen years, one at ten, one at nine, one at six years, and one at one and a quarter years, after operation. Even more remarkable is Lynch's record of his work done under suspension laryngoscopy—though his report concerning the after history of his patients is necessarily much shorter in point of time. At the 1916 meeting of this association, he presented the following statement:

1 patient operated in May, 1913.
1 in 1915 (In one of whom he did a laryngectomy 3 months later because of recurrence).

1 in July, 1914.
4 in 1916 up to the time of the presentation of his report.
All to be at that date free from recurrence.

At a meeting of the Throat Section of the New York Academy of Medicine, in October, 1917, Harmon Smith recounted the removal of a laryngeal carcinoma by the indirect method, there being no recurrence after eighteen months. He very frankly said: "Of course, had I known that this tumor was malignant, I would not have removed it except by more radical measures." Doctor Smith on examination regarded the tumor as a papilloma. To me, Smith's terse comment on his fortunate outcome is more eloquent than an essay on the "possibilities of intralaryngeal surgery in cancer" (and its improbabilities).

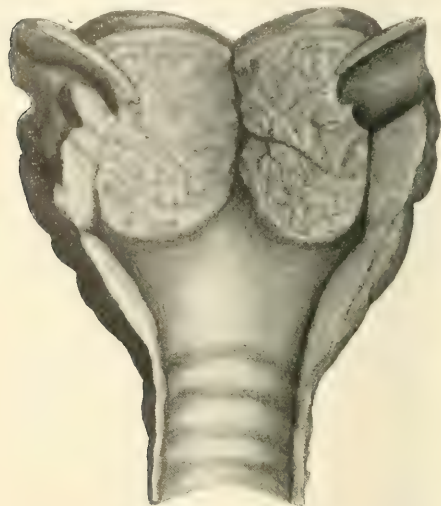


FIG. 1. Case I.

emphasis is my own). That was the old clan warr-cry of the cults of a not very remote day—most intolerant partisans of the one or the other procedure. There is not, nor can there be, any antagonism between the operations. A certain period of laryngeal malignancy justifies thyrotomy, as clearly and definitely as a later stage makes laryngectomy imperative. In the borderland, the laryngologist must choose according to his individual experience and judgment the method he shall adopt for his patient's salvation.

"The surgery of disease is, at best, a compromise; it is never a cure." And so we must make on behalf of our patient the very best bargain we can. Unfortunately, by far the greater number of these patients come to us laryngologists at a very late period, when anything short of complete extirpation of the larynx cannot be considered. The responsibility for this delay rests most often on the family physician, who from ignorance or carelessness fails to appreciate the import of the early symptoms. Therefore more laryngectomies than thyrotomies are undertaken; and, because of the greater seriousness of laryngectomy and the usual deterioration of the patient's condition when it is done, with larger mortality. If every subject of laryngeal cancer could be in the laryngologist's care when thyrotomy would suffice, laryngectomy would soon become obsolete. Even more desirable than this thyrotomic millenium would be that these patients should present themselves at a time when intralaryngeal surgery might



FIG. 2.—Case II.

Among our American laryngologists, Jackson has one of the best records, both as to thyrotomy and laryngectomy (4). He reported fifteen thyrotomies and eight laryngectomies, with no operative mortality. Among twenty-nine cases of extrinsic cancer, he did palliative tracheotomy in twenty-one. He was able to follow the history of nine, none of whom lived more than thirteen months—a much shorter time than the laryngectomized patients. In all of the

latter who lived more than a year, a buccal voice developed, that could be understood by those closely associated with the patient; he is convinced that by practice any patient can develop a buccal voice intelligible to any one. In the mechanics of laryngeal surgery, he recommends that when tracheotomy is demanded for the relief of dyspnea, it be made at the highest possible point, so that



FIG. 3. Case III. Epithelioma of larynx anterior. Arrow points to tracheotomy wound. Tracheotomy tube worn eighteen months.

in the event of a later laryngectomy it will leave the greatest extent of trachea available for mobilization and attachment to the skin—a most practical suggestion. He emphasizes the necessity for the utmost gentleness in separating the trachea from the esophagus. His dictum, "No food nor water by mouth for five days," has been superseded by the use of the permanent per nasal feeding tube and intensive feeding—a great factor in the recovery of these patients. Crile (5) concludes from his thirty-four laryngectomies: 1. Intrinsic cancer of the larynx is perhaps more curable than cancer in any other part of the body. 2. Operation should be early. 3. It should be done in two stages. (?) 4. Even if an extrinsic cancer of the larynx seems hopelessly extensive, the patient should be given a fighting chance, by as far-reaching a dissection as possible. He minimizes the importance of loss of speech.

Moure (6), once a most ardent thyrotoxicist, now, very likely, when he can be—reports between December, 1914, and March, 1917 (twenty-seven months), fifteen complete laryngectomies with no immediate operative fatalities, but with some recurrences. He attributes his better immediate results to the employment of local instead of general anesthesia; perhaps in a lesser degree to tracheotomy, two weeks before, "to accustom the lower air passages to the direct impact of air." He uses a permanent feeding tube. He concludes: Total laryn-

gectomy is a not too serious operation; good results and a minimum of recurrences depend on early intervention.

MacKenty, with a large and steadily growing record of successful work, has selected and assimilated the best features of all the other technics and added several invaluable details of his own devising, making a composite procedure which is almost ideal. The opportunity of seeing several operations by him during the past few years has encouraged me to again undertake laryngectomy, which I abandoned many years ago after some very unhappy experiences.

From my observation of MacKenty's work and my own trifling recent experience, modelled very closely thereon, I am inclined to tentatively suggest the adoption of Moure's antecedent tracheotomy, to accustom the lower air passages to the direct impact of air, which may lessen their immediate postoperative irritability and susceptibility; the tracheal opening to be made high, as Jackson has indicated, because that will not interfere with the later mobilization of the trachea. Otherwise the two step operation seems to offer no special advantage. This is the ideal field for the employment of oil ether colonic anesthesia, as devised by Gwathmey. It makes

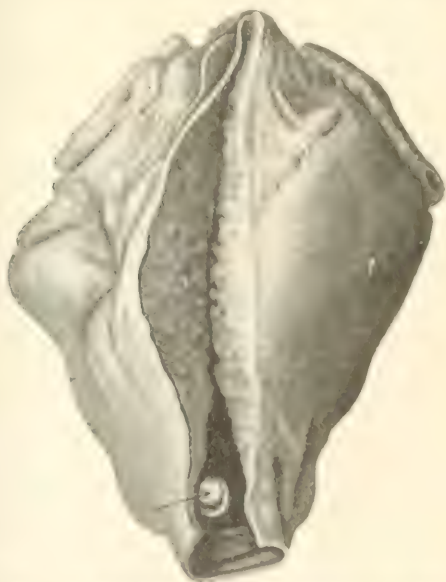


FIG. 4. Case III. Epithelioma of larynx anterior. Arrow points to tracheotomy wound. Tracheotomy tube worn eighteen months.

the whole procedure infinitely easier for both patient and operator. Even if orally intubated under total anesthesia, such an ordeal produces an enormous apprehension which cannot but be detrimental to the patient, and the degree of infiltration of the tissues, necessary to produce insensitiveness, must interfere with their repair. With rectal anesthesia laryngeal spread and the ensuing bleeding is much less than in the usual method of anesthesia from the

directly inspired anesthetic, which very largely obviates the necessity for subsequent repeated applications of the suction apparatus—in itself an agent of some danger—and there is much less likelihood of postoperative vomiting, most undesirable under these conditions.

The laryngologist for every possible reason is the man who should do laryngeal surgery, both external and internal. If he saw all these patients at an early date, thyrotomy would more often be adequate.

Laryngectomy cannot be repudiated on any such grounds as the mutilation, or the loss of voice. Laryngectomized patients are in no worse case than the blind, the deaf, or the helplessly crippled. Many of them seem to get a fair amount of happiness out of the mere fact of existence, and are not, by any means, incapable of selfsupport. In judiciously chosen cases, this operation offers a good deal more than a probability of clinical cure, and in most instances a definite retardation of the fatal ending.

As Joseph Beck says (7): "I claim that one case in one hundred that will recover, following such heroic measures, is *one hundred* per cent. of cures, because, without that procedure, the patient would succumb to the disease."

CASE I.—A man, fifty-four years old, was admitted to the Kings County Hospital about December 1, 1917. For three months previously he had suffered from hoarseness, increasing dyspnea and dysphagia and latterly had raised blood stained sputum. There was moderate pain in the larynx. Wassermann test negative. Examination showed a mass pretty well filling the larynx, involving the left arytenoid and extending into the hypopharynx. A specimen was removed and pronounced epithelioma. On December 6th a hurried tracheotomy was demanded by imminent asphyxiation. On December 28th, with Doctor MacKenty's assistance, I removed the larynx under oil-ether colonic anesthesia. It was necessary to take out about an inch and a half of the esophagus, with the exception of a narrow strip of the posterior wall. The tissues were united over the per nasal feeding tube, but there was considerable sloughing and the whole hypopharynx opened up in a few days. Notwithstanding this, the patient did remarkably well—the tube being reinserted in the open esophagus at the time of each feeding—every four hours, day and night. Repair went on satisfactorily till the sixth week, and we were planning to attempt a closure of the esophagus by some plastic method. At this time a typical lobar pneumonia developed and the patient died in a postcritical collapse on the sixth day.

It will be noted in the specimen (Fig. 1) that in the interval between the tracheotomy and the laryngectomy—three weeks—the growth has entirely obliterated the lumen of the larynx.

CASE II.—A man of forty-four years gave an indefinite history of a primary luetic infection, and there had been a positive Wassermann test. For the previous year he had suffered from progressive hoarseness and dyspnea. There was a subglottic mass to be seen on the left side of the larynx, irregular in form and grayish in color, a moderate infiltration of the left ventricle and the right vocal band was swollen in its anterior third. A superficial specimen was removed and reported as "possibly syphilitic." Vigorous treatment was given for two weeks with no sign of improvement. On January 9th, because of seriously increasing dyspnea, a high tracheotomy was done under local anesthesia; at the same time a deeper specimen was obtained and pronounced "typical epithelioma." On January 30th, with the assistance of MacKenty and Talbot R. Chambers, under oil-ether colonic anesthesia, I removed the larynx. Feeding was conducted through the permanent per nasal tube which was retained for two weeks. The pharyngeal wound healed per primam. The

highest rectal temperature was 100.5° F. The patient was up on the fourth day and left the hospital on the nineteenth. Tracheal suction was never required. He has gained sixteen pounds, is beginning to have an intelligible buccal voice, has resumed his position—that of a clerk—and says that he is entirely satisfied with his condition.

CASE III.—A man of forty-five years, by occupation an electric welder, was seen in 1910. A year previously he became hoarse, and for six months had had choking attacks with increasing dyspnea and dysphagia. An immediate tracheotomy was done, and he was kept under observation for some time.

As far as I could determine, the laryngeal growth when I first saw him had not increased when the larynx was removed on autopsy. He lived for eighteen months after the tracheotomy, working at his trade for almost a year of that time, finally dying from inanition from closure of the esophagus by outside pressure, due to the enormous surrounding glandular involvement, though the esophagus itself was not affected. The tumor was an epithelioma, which completely filled the larynx, with an enormous, though curiously circumscribed, extrinsic involvement of the cartilages, so that the appearance of the removed larynx suggests a large cyst.

In a similar case, I should be inclined to follow Crile's suggestion to "give the patient a fighting chance by as far reaching a dissection as possible," rather than witness such sufferings as this man endured during the last six months of his life.

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170 CLINTON STREET.

SUGGESTIONS FOR IMPROVING THE OPERATION FOR CATARACT.*

Preliminary Capsulotomy, Lower Section, Simple Extraction, and Wound Suture. Value of Lower Section and Wound Suture in Intracapsular Extraction and Relative Value of the Various Modes of Intracapsular Extraction.

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A perfect cataract operation should furnish the best possible vision by rendering the media entirely clear and leaving intact ocular parts, the integrity of which adds to visual acuity. It should not disfigure the eye nor subject it to greater danger than is absolutely necessary for the attainment of good vision.

Iridectomy is not in keeping with the first two requirements. For the iris coloboma not only mars the beauty of the eye but also impairs vision. Schweigger (1) refutes the generally accepted view that visual acuity after combined extraction is as good as after simple extraction. Yet the former is justly the operation of choice at present because the latter is more often followed by iris prolapse with its attending dangers.

The attainment of clear media is often frustrated because of the inadequacy of ordinary cystotomy, i. e., of opening the capsule after the section. H. E. Smith (2, 8) has clearly pointed out several disadvantages of ordinary capsulotomy. I would

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add another point which seems to me to be still more important (3). Through the opening of the eye the lens with its capsule has lost a good deal of stability, and a loose membrane cannot be cut well even with a sharp instrument, much less with the cystotome, which can rarely be made perfectly sharp. The various capsular incisions, cross shaped, T shaped (4), circular (5), linear (6), made after the section, undoubtedly may be performed as described, but frequently they will not succeed simply because the capsule having become movable recedes before the cutting instrument. The result is an insufficient capsular opening and retention between the capsular plates of lens matter from which opacities develop. Subsequent opaque membranes may also arise in another way. Even when the capsular incision has turned out fully sufficient, cortical masses remain in the eye after expression of the lens, cleaving to the capsule from which they have not been separated. Massage of the cornea with the lid, irrigation of the chamber, or introducing into it a spoon, after Hess (7), will remove a good deal of these masses, but not all of them. From these remnants opacities develop subsequently, though of lesser density than those due to insufficient opening of the capsule.

I was, therefore, very favorably impressed with Homer E. Smith's publication in the *New York State Journal of Medicine* (8). For besides offering an excellent method of operating immature cataracts it showed also a very simple way, devoid of danger, of obtaining a good capsular incision and a good separation of the cortex from the capsule. In cutting the capsule in the closed eye we are not dealing with a movable membrane, but with a steady one, the lens with its capsule being held firmly in place. For this reason and because we can see the movements of the cutting instrument across the capsule which in ordinary cystotomy is often obscured from view through bleeding in the chamber, a good large capsular incision can be made. Elsewhere (3) I have pointed out a modification of Smith's way of cutting the capsule whereby a cross cut can always be obtained. With Smith's way the capsular incision will often be merely T-shaped. Such a cut is sufficient, too, but a cross is larger yet and the largest possible capsular opening should be made.

The second great advantage of Smith's device is the separation of the cortex from the capsule by the humor aqueus being given access to the lens and by allowing it to act upon the lens sufficiently long so that at the expression the lens comes out of its widely opened capsule like the kernel of a ripe nut from its shell. The two advantages of Smith's method, *i. e.*, proper capsular incision and separation of the cortex, are just as great in mature as in immature cataracts (9). Another valuable feature is that the method is devoid of any danger provided the interval between capsulotomy and extraction is not made too long. I cannot agree with Sattler (4), who rejects preliminary capsulotomy for mature cataracts because, as he says, "the extraction must take place one or several days later" and much swelling of the lens and irritation of the eye develop meanwhile, greatly impeding section and extraction. Herein he is probably right, but the swelling and

irritation he has encountered are due to the too long interval. In mature cataracts one should not wait one or several days, but at most six hours. Even in immature cataracts the interval need not be any longer, and only when capsulotomy and extraction cannot be made on the same day one may perform the latter about sixteen to eighteen hours later.

Preliminary capsulotomy followed by a sufficient interval offers a safe and easy means of attaining the first requirement for a perfect cataract operation, *i. e.*, entirely clear media. Should some lens matter remain in the eye it will be but small in amount and will be entirely absorbed because of the large capsular opening, and if it give rise to an opaque membrane, the latter will be very thin so that its discission will be an easy slight operative step.

No safe way, however, has yet been devised to fulfill the second requirement for a perfect cataract operation, the preservation of the integrity of the iris with a round, central reacting pupil. Simple extraction furnishes eight to ten per cent. of the dangerous complication of iris prolapse. Schweigger's (1) incision of the iris near and parallel to its root injures the vitreous body and does not wholly prevent iris prolapse, neither does Hess's (10) "Basalexcision" of the iris though it seems to be preferable to Schweigger's peripheral cut. Moreover in both procedures the iris does not remain intact although Schweigger (1) maintains that his iris cut later disappears without a trace. Czermak's subconjunctival extraction (11, 12, 13) is not free from iris prolapse either (13).

It would appear that complete and thorough closure of the wound through sutures leaving no slit through which the iris could protrude would entirely preclude iris prolapse. Keeping this in mind I thought out a method of cataract operation, wrote it down in December, 1915, and laid the manuscript aside. At that time all I knew about suturing the wound in cataract extraction was that Williams, of Boston, had employed it already in 1867. Later I began to read works on the subject and became rather discouraged. For I learned that wound suture after cataract extraction had been tried extensively, and yet ophthalmic surgeons practise it too little, hence it must be impracticable. I almost gave up my whole scheme. More thorough study, however, of the various ways of wound suture in cataract extraction convinced me that it was only imperfect procedure that brought frequent failure, and this prevented the adoption of such suture by ophthalmologists. Williams (14) applied only one suture at the apex of the incision leaving on one side of the wound a slit of about six millimeters long enough for the iris to fall through. Besides his procedure was difficult. The wound was kept open after contraction of the iris. Yet he had good results, especially among the pseudo-phacolytic cataracts (15). Von Sattler (16) and Kalt (17) employed a double suture; besides, their technic is immensely complicated. Their reports as to results stand in contrast to those of Williams (18). Kalt (17), who had had experiences with Kalt's suture. The faults of these two procedures consist chiefly in introducing the threads before the section and in not including within the suture sufficient tissue. The

first shortcoming renders the section very difficult and the second one nullifies the end striven for. The bulbar coat at the sclerocorneal junction is barely one millimetre thick and the authors passed the thread between the lamellæ of the cornea thus including within the suture tissue only about one half millimetre thick in one direction and one millimetre in the other. Such sutures will often cut through. Perhaps this happened in the three cases of iris prolapse which Schweigger had among twenty-seven operated after Kalt. Maddox (18) has proposed a corneal suture about which he himself remarks that it may appear unsurgical. He leaves two threads running across the cornea from the upper to the lower limbus. Such a suture is unsurgical indeed, and, besides, leaves open parts of the section long enough for the iris to fall through. The procedures of Müller (19) and Verhoef (20) are much too difficult of execution as are all those in which the threads are introduced before the section. Bourgeois's (21) suturing of an external lateral corneal section will hardly find an imitator. His double broad needle with its two detachable parts to be taken apart in the middle of the section is too complicated an instrument to handle. His place for the section is most inappropriate in spite of his praise of it. His sutures including only one half millimetre of corneal tissue are hardly safe from cutting through.

Other devices of wound closure, as that of Kuhnt (22) who covers the wound by drawing over it a doubly adherent conjunctival flap, and that of Czermak (11, 12) who expresses the lens through a previously formed conjunctival pocket which is afterwards closed with a suture does not prevent iris prolapse either (12, p. 478). The iris may protrude into the pocket.

Only one author, Czermak, as far as I was able to find in the literature, describes a procedure easy of execution and offering the possibility of establishing complete wound closure. This procedure is similar to the one I have in mind. That Czermak, too, had iris prolapse in two out of ten cases is easily explained. In one case he employed only one stitch which is entirely insufficient. In the other case he put in two sutures. But two are not fully sufficient either, even when in the right place, and still less when put in wrongly. He himself states that in the second case the sutures were too near the wound angles. Indeed Czermak seems to contradict himself. He prescribes (13) that the intervals between the stitches and between the latter and the wound angles should not be longer than three millimetres, with which I fully agree. This would require at least three stitches. Yet he goes on and describes his procedure (13) with but two stitches, mentioning that a third suture may be put in but is not advisable because it would cause confusion. Anticipating confusion I employ alternately black and white threads, and I insist upon three stitches at least. Czermak's description is not at all clear about the amount of tissue he included within the suture. If it was too little his threads were apt to cut through. The needles should be put through at least one millimetre away from either wound edge and go almost through the whole thickness of the central one. Another drawback of Czermak's pro-

cedure is the upper section. He mentions (13) briefly that the lower section may be selected in deep seated eyes and in patients who cannot look down, but otherwise he advises against it because the place is unsuitable for an iridectomy which may become necessary. I prefer in all cases a lower section, with a slight nasal turn. For it is much easier to sew a lower section than an upper one where one has to work almost under the upper lid. Being confident that the iris cannot protrude through a wound completely closed with a sufficient number of sutures, including a sufficient amount of tissue, I do not fear that the necessity for iridectomy may arise after completion of the operation. Should it arise during the operation before closing the wound it will be possible to make an iridectomy in the lower inner quadrant which is not so bad a place for an iridectomy after all. This is the reason why I give the section a slight nasal turn.

From the above, the chief features of the cataract operation which I wish to suggest may be gathered. They are preliminary capsulotomy, lower section without iridectomy, and closing of the wound with sutures. But the details being very important, too, a full description of the intended operation is here given.

After having dilated the pupil with homatropin and cocaine the eye, the operator sitting at the side and in front of the patient in the left eye (at the head in the right eye)¹ passes a Homer E. Smith knife through the lower outer (upper outer) corneal quadrant (Fig. 1, a) of the eye which must be well illuminated in order to see the movements of the knife exactly. The point is advanced to the upper (lower) end of the vertical diameter of the dilated pupil (x). Here it is thrust into the capsule and with on sweep a cut is made in the capsule downward (upward) along the diameter to its lower (upper) end (y). As the blade travels along the diameter in making this cut the knife is withdrawn from the chamber accordingly in order to avoid dipping too far into the lens. The point is now brought to the temporal² end of the horizontal diameter (v) and an incision made in the capsule from here to the centre of the diameter (o) but no further. The point is now raised a little and carried across the surface of the capsule to the nasal end of the horizontal diameter (z). All the time from its entrance into the chamber till this moment the knife has been held with its edge toward the operator and no turn of the handle around its axis has yet been made. Now the handle is turned around the axis more than 90° so that the edge is toward the capsule, and the latter is cut from the periphery to the centre along the horizontal diameter. The knife is turned back into its first position

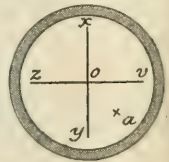


FIG. 1.—Preliminary capsulotomy: a, point of entrance through external lower quadrant; x, point near upper end of vertical diameter of pupil; y, near lower end; z, point near temporal; v, point near nasal end of horizontal diameter of pupil.

¹Remark. The manipulations with the knife are more convenient in the left eye than in the right one, the lower outer quadrant being a more handy place of entrance. This is the reason why the above description was given for the left eye.

²The reason for this deviation from Smith is given on page 406 of reference 3.

and withdrawn from the eye. The time required for the incision need not be more than ten to fifteen seconds. A moist pad is put over the eye and fastened with adhesive plaster. The patient is directed to remain in bed.

After an interval of four to six hours in mature cataracts and of half an hour to an hour in hypermature ones the removal of the lens is undertaken. After instilling cocain and adrenalin a large lower slightly nasal section is made with a Graefe knife or with the broad knife of Richter as described by Schweigger (1) and a conjunctival flap formed one to two mm. broad. Now three threads of fine silk alternately white and black and provided with fine needles curved and not too short are put through in the following manner. Without exerting the slightest pressure on the eye the conjunctiva is grasped with toothed forceps at the middle of the peripheral wound edge and lifted somewhat. One to 2 mm. away from the edge (Fig. 2a), a needle is passed through conjunctiva and superficially through the sclera and made to emerge in the cut surface of the margin of the wound near its inner side (b'). Needle and thread are pulled through. The conjunctival flap at the central wound edge is

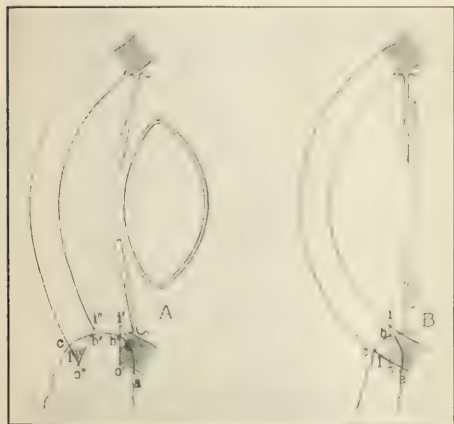


Fig. 2. Sewing the wound in cataract extraction. A. Wound open and gaping; cataract on the eye. a', cut surface; a, peripheral wound border; o', cut surface of central wound border; o, outer side of peripheral wound border; o'', outer side of central wound border; i', inner side of peripheral wound border; i'', inner side of central wound border; a, point of entrance of needle into; b', of emergence from; peripheral wound border; b'', point of entrance of needle into; c, of emergence from; central wound border; l, limbus. B. Cataract removed, wound borders drawn together; o i, plane in which the two cut surfaces are in contact.

now lifted at its apex with the forceps and the needle passed through from inside to outside, the tunnel for the stitch beginning inside on the cut surface of the wound border very near the inner side of the latter (b''), but not centrally to that point and ending outside at the base of the flap or even slightly in the cornea (c). Also here needle and thread are pulled through. In transfixing the central wound border from inside to outside the danger of injuring the iris is avoided, while in piercing the border from outside to inside the point of the needle may become en-

tangled in the iris. The other two threads are put through in the same manner, except that grasping the edges is not necessary any more, the previous thread being sufficient to lift and steady the edges. The three threads should divide the whole extent of the wound into four parts each about 3 mm. long. The thread between the edges are pulled forth until they form nooses long enough to be laid aside, one nasally, the other two temporally, so that they are entirely out of the way during the rest of the operation. The threads being alternately white and black no confusion will arise.

The lens is now expressed with a spoon or with the instrument which I had made chiefly for intracapsular extraction. It is a large strabismus hook to which I had attached a cylindrical piece 5 mm.

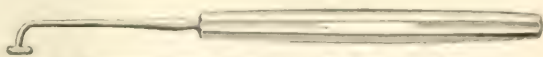


Fig. 3. Instrument for the removal of a hypermature cataract.

long and parallel to the handle (Fig. 3). Thereupon the middle thread is drawn together and tied even if the iris should happen to lie in the wound. While the wound edges are approached and drawn over the iris, it will fall back by itself or, if not, may be gently pushed away from the wound into the chamber. If the iris be in correct position, the lateral threads are also tied, otherwise a spatula is introduced through the lateral parts of the wound, its angles are freed from iris, and the latter is gently manipulated until a round central pupil is seen, whereupon the lateral threads are tied. The eye is cleaned, some eserine salve laid into the conjunctival sac and a moist bandage applied which is renewed every day. On the fourth day the sutures are removed under cocaine anesthesia and the patient is permitted to stay out of bed all day long. The bandage is better continued for one day more.

The salient feature of the operation just outlined is the sewing of the wound. Through the lower section, through the number of sutures which should be at least three, through including within the sutures a sufficient amount of tissue, and through the operative stage at which the threads are to be put in, the procedure differs essentially from that employed by an ophthalmic surgeon as far as I was able to gather from the literature.

Considering the operation as a whole, only the putting in of the sutures is added to the operative steps of ordinary cataract extraction. This alone merely prolongs the operation by a few minutes, but adds no new difficulty worth mentioning and no new danger as far as the accomplishment of the operation is concerned, since the threads are introduced after the section and before expression of the lens. On the contrary the whole method facilitates cataract extraction considerably and thereby diminishes the dangers of the latter. The iris can be replaced more easily after tying one or two threads than when the whole wound is open. Even a recalcitrant iris which prolapses again and again in spite of all attempts at reposition can be brought back into the chamber by tying the threads over it. Before expressing the lens the iris will not prolapse and

occur except when the patient is very unruly. Once the threads are in place prolapse of vitreous body, just as iris prolapse, can be more easily controlled than without the threads because the wound can be quickly closed. Indeed Kalt (17) remarks that it was just a case of prolapse of vitreous body that impressed him so very much with the value of wound suture in cataract extraction, and he employed only one suture. Other ophthalmic surgeons, as Galezowski (23), who would not sew the wound in cataract extraction without accident, advised doing so when prolapse of vitreous body has occurred during the operation, and they employed an upper section, which is much more difficult to sew than a lower one, and had to introduce the threads after the serious accident had happened. In our operation the greatest difficulty would arise if the vitreous body prolapsed immediately after the section. We could, nevertheless, put in the threads, since this can be done without the slightest pressure on the eye. The lens would then be taken out with the loop and the threads tied, first partly and after reposition of the iris completely. Prolapse of the vitreous body in any stage after introduction of the threads would offer less difficulty than just mentioned and, just through the threads, could be more easily managed than in ordinary extraction.

The lower section, too, greatly facilitates the work not only in complications but also in normal conditions. The operator is not hampered by the upper lid and eyebrow, the patient need not be frequently exhorted to look down which he sometimes cannot do, the introduction of needles, spatula, etc., from the side of the cheek is far easier than from the side of the brow, especially when the eye is deep seated. Finally, general narcosis, sometimes necessary with insane or obstreperous patients, may be employed with greater safety when the wound is immediately closed than when it is left open. Williams (14, 15) always employed general narcosis.

The advantages of the method for the patient are manifold. The largest possible capsular opening and the separation of the cortex from the capsule help to remove the lens completely or almost so, and no lens matter or only very little remains in the eye. Thereby a source of inflammations and of secondary opacities requiring secondary operations is removed. The wound angles can be better cleared from wedged in iris than in ordinary extraction. Incarceration of the iris is thereby prevented and a second source of iritis done away with. Iris prolapse during the operation can always be replaced and later prolapse is precluded. This renders safe simple extraction with preservation of a round central reacting pupil whereby vision is improved and other annoyances which patients with iris coloboma are subject to are removed. The closure of the wound hastens its healing and shortens the period of convalescence. It prevents bursting of the wound through carelessness of the patient or through accidents. It renders superfluous a long stay in bed, which is sometimes very troublesome, as in old patients and those affected with pulmonary troubles. Confinement to bed need not be extended longer than one day, and even on the same day the patient may be permitted to sit up if the horizontal position inconveniences him.

The very same method with omission of preliminary capsulotomy would facilitate intracapsular extraction and remove some of its dangers. Indeed it was just the shortcoming of intracapsular extraction that suggested it to me. I do not wish to be understood as advocating intracapsular extraction. Stanculeanu mentions among its after complications opacities of the vitreous body (24) from which degeneration of the latter may be inferred. Lancaster (25) too, evidently unfamiliar with Stanculeanu's statement, asks whether other ophthalmic surgeons have observed opacities of the vitreous body after intracapsular extraction and whether this complication which he had seen in several cases of intracapsular extraction was merely accidental or due to the mode of operation. In the latter case he is inclined to attribute the complication to traumatism of the ciliary body. Stanculeanu (24) observed bleeding as a complication of intracapsular extraction and seems to wonder that Indian and American authors never mention this. It is therefore doubly appropriate to add here that Knapp (26) does mention one case of subchoroidal bleeding among only 104 cases of intracapsular extraction by pressure alone, and three cases of bleeding in retina and vitreous body and one of retrochoroidal hemorrhage among ninety-four cases of intracapsular extraction by traction and pressure combined (27). Meding (28) reports four cases of hemorrhage fatal to the eyes among eighty-three operated by the intracapsular method. Two of these were complicated with glaucoma, one with nephritis, and in the fourth no contributing complication is given. Even leaving aside the cases complicated with glaucoma and nephritis, the experiences of the last two surgeons as to disastrous bleeding contrasts greatly with the percentage of such hemorrhage reported by other ophthalmologists. This percentage is exceedingly small. De Wecker (29) had such hemorrhages only eight times among 3,000 cataract extractions, Mooren (30) three among 2,872, and Da Gama Pinto (31) three among 711.³ If the above experiences had any bearing to the mode of operation, if opacities of the vitreous body and bleeding did occur more often in intracapsular than in extracapsular extraction, the justification of the former would be open to doubt.

I personally consider as one of the greatest drawbacks of intracapsular extraction the frequent occurrence of displacement and distortion of the pupil, and also of iris prolapse in spite of iridectomy. I attribute the cause of these after complications to the difficulty, not to say impossibility, of replacing the iris properly. The wound angles cannot be cleared from wedged in iris because the vitreous body lies close behind, not separated from them through posterior capsule, and is readily injured and made to prolapse by manipulations with the iris spatula. With the upper section the wound lies often deep under the upper lid and it is dangerous to draw the eye, or to make the patient look, down after the exit of the lens with its capsule. The wound angles and wedged in iris are but poorly visible, and the spatula cannot be handled properly,

³ A large literature on disastrous (essential, retrochoroidal, exulserous) bleeding is given by Golovine (32) and Bloom (33).

inside the vault above them. Owing to these difficulties the iris is often not replaced properly and the results are frequent incarceration of the iris, displacement and distortion of the pupil, and also iris prolapse.

It occurred to me that three threads could be put through after the section and before expressing the lens without difficulty and without the slightest danger during the whole operation. Laid aside in the form of nooses sufficiently long, they would not hinder nor alter any mode of procedure of intracapsular extraction. After delivery of the lens in its capsule the threads could be tied. This would prevent late iris prolapse, and, by facilitating the reposition of the iris, also its incarceration and displacement and distortion of the pupil. Iridectomy would then be unnecessary. My first idea was, therefore, to close the wound with sutures and to omit iridectomy.

It would be easy to put through the threads before delivering the lens when the eye may be drawn, or the patient be made to look, downward, but it would be extremely difficult to tie them after the exit of the lens when drawing the eye downward is dangerous and even making the patient look down may cause prolapse of vitreous body. This suggested to me the idea of a lower section and I was at once struck by the further thought that the lower section would not only greatly facilitate the sewing of the wound but also intracapsular extraction in general. For it would render the wound better accessible and thereby dealing with the operative complications, incarceration and prolapse of the iris and prolapse of the vitreous body, made easier through the threads, as shown before, would become still more easy.

Thus from observation of the difficulties and immediate complications of intracapsular extraction the method outlined above gradually developed in my mind. Subsequently I substituted preliminary capsulotomy, after Homer E. Smith, to delivery of the cataract in its capsule, because the former mode of procedure subjects the eye to very much less danger than the latter.

Those, however, who would rather remove the capsule together with the lens may omit capsulotomy and as for the rest follow the method as described. That one of its operative steps, the suturing of the wound, would be of service in intracapsular extraction has already been mentioned by Maddox (34). He advises to sew the wound only in insane and obstreperous patients and adds the following remark about sutures of the wound in intracapsular extraction: "I cannot help thinking, too, they might prove of service to those who practice the extraction of the lens in its capsule." It was mentioned before that his suture is unsurgical and too complicated even for ordinary extraction. The only ophthalmic surgeon, as far as I know, who has not only proposed but actually employed wound sutures in intracapsular extraction is Verhoef (20). But his whole mode of procedure adds a good many difficulties to those already present in intracapsular extraction. The above described way, however, of sewing the wound, together with the lower section, would add no new difficulty worth mentioning and even lessen those pertaining to intracapsular extraction.

It is hard to decide which method of delivering the lens in its capsule is most recommendable. The more frequent occurrence of prolapse of the vitreous body as compared with extracapsular extraction is probably common to all of them. The Pagenstecher (35) method lends itself almost only to cases with atrophic zonula, as in high myopia and hypermaturity. The vitreous body is injured more or less, a spoon being introduced into the eye behind the lens sometimes as far down as its posterior pole. At any rate this step would be easier with a lower section than with an upper one, and the threads previously put in would help to control prolapse of vitreous body which is very frequent in this method.

In the method of H. Smith (36), of India, a spoon is introduced into the vitreous body only in case of necessity, and therefore it is by far preferable to the previous method, leaving aside its being applicable to almost all forms of cataract. But this necessity is not so very rare. Moreover in order to deliver the cataract by pressure alone the latter has to be quite considerable, greater than has seemed "wise" to Knapp (27), and must sometimes be continued for a very long time, not so very rarely for several minutes. This cannot be indifferent to the welfare of the eye nor to the feelings of the patient. The difficulties and dangers of the Smith method would be considerably diminished through the lower section and the sutures. The troublesome task for the assistant of handling the upper lid and the eyebrow would not be required.⁴ The wound would be readily accessible in case of escape of vitreous body. Prolapse of iris and of vitreous body would be easily managed, and reposition of wedged in iris facilitated through the threads and the lower section. The method of expressing the cataract would not be altered except that the pressure would be applied on the upper part of the cornea instead of on the lower one.

In Gradenigo's (30) intracapsular extraction the lower section and the sutures would offer the same advantages. The nooses of thread would not hinder the movements of the blunt hook with which he ruptures the zonular ligaments. It is true after rupture of the zonula much less and shorter pressure will deliver the lens. But it is a very dangerous proceeding to break fibres invisible and in close proximity to the vitreous body by the end of a hook covered from view by the iris so that its movements cannot be seen. Gradenigo claims that they are recognizable through the iris tissue as through paper. But how about bleeding in the chamber? This he admits may frustrate his operation.

Less trying for patient and surgeon are those modes of intracapsular extraction which combine traction with pressure. For the pull on the ora serrata through the zonula which Hess (7) considers not to be indifferent is the same as in removal of the lens by pressure alone, since, in both cases, the zonula has to be ruptured, but very much less pressure is required when traction, too, helps to loosen the moorings of the lens. Knapp's (27) procedure hardly differs from that of Stanculeanu

(24). In both traction first dislocates the lens and then pressure delivers it. Török's (40) mode of intracapsular extraction seems to be preferable to all. It differs from the one previously mentioned in that traction, with which alone he begins to loosen the lens, does not cease after pressure has been added to it, both being continued until the lens has been delivered. Lancaster's (25) suggestion to improve Török's procedure by applying right from the start both traction and pressure is a very good one. The lower section and the previously introduced threads would cause no impediment to traction and their advantages would be the same as in removal of the lens by pressure alone.

All procedures in which traction is employed have one great disadvantage in common of which removal by pressure alone is free and this is that the grasping of the anterior capsule does frequently not succeed even with toothed forceps. On account of this Sattler (4) prefers cystotomy to tearing off the anterior capsule blade with forceps. With smooth forceps, as that of Kalt, it is often still more difficult to raise a fold of the capsule and the same is probably the case with Verhoef's (20) and Vail's (41) capsular forceps. Moreover it is to be considered that the capsule is a delicate membrane which is readily broken by the mere touch of a hard instrument and much more so by grasping and pulling with it. Indeed the percentage of cases in which intracapsular extraction through traction does not succeed is extremely high. In 240 cases Stanculeanu (24) was unsuccessful 103 times. It is true when the capsule has been ruptured too early, the operation may be finished in the ordinary way and no harm has been done. But it is a great disappointment to an unprejudiced surgeon to set out to apply one method and be obliged to change to another one, and a still greater disappointment to an intelligent patient, after having been told his cataract will be removed in its capsule to avoid secondary operations, to find out that he still has his lenticular capsule and perhaps the prospect of having to undergo a secondary operation.

It was stated before that the sutures add no new danger as far as the accomplishment of the operation is concerned. But they may be a source of danger in the healing period. First the threads left in the eye for several days may act as a foreign body producing irritation. The latter, however, will not be considerable. For the threads, as a glance at the second illustration shows, do not come in contact with the iris, and even the humor aqueous barely touches them since they are running through tunnels entirely outside the anterior chamber and the communication between tunnels and chamber along the cut surfaces of the borders of the wound is soon interrupted, probably in a few hours, by these surfaces cleaving together. Second, the danger of infection is decidedly enhanced by the tunnels and by the threads remaining in the eye, both offering to microorganisms a road to the tissues of the eye. This danger must be obviated by observing the rules of asepsis and antisepsis most scrupulously. If Williams fifty years ago with inferior methods in this regard was able to obtain good results, we with far better developed means and methods of asepsis

and antisepsis should have most satisfactory results as far as infection is concerned.

To justify the publication of theoretical considerations it is not necessary that they be supported by practical accomplishments. In scientific work theory usually precedes practice. If the results the latter may lead to be worth striving for, it is worth while to examine whether or not there is some merit in the former. I leave it to ophthalmic surgeons having a large material at their disposal to examine the suggestions offered in this article and if they find any merit in them to furnish their support through many practical accomplishments. I am confident that they will do so. For the examination entails no trouble, but only a few minutes' deliberation, and the perfection of the operation of cataract, is certainly worth striving for.

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CLINICAL SIGNIFICANCE OF INTESTINAL HEMORRHAGE.

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Bleeding, pain, and diarrhea are the cardinal bowel symptoms, the first so significant as to merit special study. The history furnishes the clue as to source in many cases, but frequently misleads because of the personal equation of the patient, who, in excitement, exaggerates the blood loss, so here the physician must rely upon his own acumen and skill in making a thorough examination to reach a correct diagnosis.

Hemorrhage incidental to diseases recognizable by their characteristic symptoms or syndrome, or other evident causes, are beyond the scope of this paper. These include the hemorrhage in certain infections, as typhoid and yellow fever, acute enterocolitis, severe malaria, sepsis and pyemia; bleeding in the hemorrhagic diatheses and blood dyscrasia, as hemophilia, purpura, melena neonatorum, severe pernicious anemia, leukemia, severe icterus or scurvy; of gastric and duodenal ulcer or an ulcer secondary to an extensive cutaneous burn; ruptured varicose veins of the esophagus; of intestinal parasites, as ankylostoma duodenale; actinomycosis of the intestine; so called vicarious menstruation, which is still debatable; following traumatism, and that of foreign bodies swallowed or introduced per anum.

In every obscure case of intestinal bleeding a complete examination of the blood should be made, including the Wassermann test to eliminate or confirm syphilis and its protean manifestations. A leukocytosis with increased polynuclears suggests an inflammatory process, while eosinophilia may be a clue to intestinal parasites. The hemoglobin percentage and the red cell count are indices to the degree of anemia, and the morphology of the cells indicates whether the anemia is primary or secondary.

Bleeding in children, apart from that occurring in enterocolitis, is relatively frequent and usually from one of three sources:

First, partial or complete prolapse of the rectum, usually secondary to constipation, drastic catharsis, or an acute enterocolitis.

Next is a *polyp* or *multiple adenomata*. In the case of the single polyp (there may be several), the mother usually states that the child has hemorrhoids which protrude at stool, bleed, and are reduced spontaneously or by pressure. This testimony is to be discounted as a rule, for hemorrhoids in children before puberty are very exceptional. The solitary polyp usually has a low attachment and can be felt by the examining finger. An exception is the polyp with long pedicle implanted high, which allows the tumor to recede before the examining finger. The proctoscope, however, detects it readily. Quite different is the condition of multiple polyposis, or multiple adenomata. These little tumors are numerous, mostly sessile and soft, do not protrude, and give rise to frequent colicky motions, containing considerable blood. Their prompt recognition by the proctoscope is essential, for, if neglected, over half of the cases become malignant adenocarcinoma in the comparatively short space of two or three years.

The third source of bleeding in children, and one which is not generally recognized, is prolapse of the sigmoid into the rectum. This is really an intussusception or third degree prolapse of the rectum. The repeated traumatism of the mucosa from the straining efforts at defecation results in inflammation, then ulceration of the mucosa with the squeezing out of blood at every stool.

My earliest experience with this condition was in the following case:

Case History. A girl of 10 years, entered in 1921, with a history of severe constipation the previous year, indigestion, and passage of blood, both fresh and in clots, with stool. Pain and "bearing down" were severe at time of defecation. Weight, 37½ pounds, was stationary during the previous four months.

In the knee chest posture and without anesthesia the small calibered proctoscope was passed nine inches. No polyps were present. The sigmoid prolapsed into the tube, and at the rectosigmoidal juncture there were superficial ulcerations from which blood oozed. Mucus was present in excess. Three ounces of olive oil were instilled every night. The constipation was relieved, the ulcers healed, and in three months the bowels acted normally. She has gained steadily in weight and has had no recurrence of the bleeding.

In adults the bleeding from hemorrhoids is such a common occurrence and so far exceeds all other causes of hemorrhage, that in the lay mind practically all bleeding from the rectum is ascribed to piles. Unfortunately this opinion is shared to such a degree by physicians that many accept the patient's diagnosis without making an examination. This shifting of responsibility is a grave error that often brings chagrin to the physician and needless suffering to the patient. Even life itself may be at stake, for what experienced physician has not seen cases of carcinoma of the rectum in which palliative treatment was applied to harmless piles till the favorable time was lost for removal of the primary condition, namely, the cancer. Further, I have seen many cases where hemorrhoids were ablated while the operator even then did not discover the tumor, which was within reach of the examining finger. The lesson from this unfortunate occurrence is that no case of bleeding piles should be submitted to operation before proctoscopy. Internal hemorrhoids that bleed can usually be caused to protrude. Exceptional cases are those complicated by fissure which renders the sphincter spasmodic; and at times the reflex inhibition present in thrombosed, inflamed internal hemorrhoids, which, however, the finger detects readily. In any case of unexplained bleeding, the pile bearing area should be inspected through the anoscope.

Bleeding from hemorrhoids occurs in three principal forms: a rather copious hemorrhage at long intervals, a pouring stream of blood from a single ulcerated pile, and a constant oozing. The copious bleeding is often due to the rupture of an over-distended vein from pressure of the feces, and may act as a safety valve to relieve the portal congestion. As such it is salutary and does not require treatment unless the hemorrhage is so excessive and frequent as to deplete the system. Theoretically, similar conditions should prevail in the back pressure of certain diseases of the heart and lungs, though in these cases the bleeding is not so profuse. The daily capillary oozing or the daily spurring

from an ulcerated hemorrhoid, especially in the aged. As constant dropping wears the stone, so a daily loss of unreplaced blood results in anemia. In patients suffering from secondary anemia, the physician should always include hemorrhoids as a possible cause. Frequently the hemoglobin is reduced to from thirty-five to fifty per cent. This and the accompanying systemic symptoms are promptly relieved by removal of the hemorrhoids under local anesthesia or by the injection treatment.

Thrombotic external hemorrhoids deserve notice because of their frequent occurrence. The acute pain accompanying their onset frequently causes these patients to seek medical relief, when a simple incision at once under local anesthesia in the office, and turning out the clot, ends the trouble. When neglected, the clot may organize and a skin tag only remain. In other cases, pressure necrosis of the mucosa and ulceration occur, followed by a con-

CASE II.—H. B., aged seventy-one. He suffered from constipation, a fissure and hemorrhoids sixteen months before I saw him in August, 1916. Five months after the onset of his trouble the sphincters were dilated under gas anesthesia and two weeks later the "fissure" was treated and the hemorrhoids removed under local anesthesia. He was told that he did not have cancer but the wound never healed. He had constant discharge of blood and severe local pain. His weight had dropped from 197 to 145 pounds during the six months before he visited me. Physical examination showed a good general condition. The anal canal was relaxed, an excoriated trough extending its entire length in the posterior commissure. This was indurated and the cartilaginous induration extended one fourth way round the canal on each side of the commissure and into the post-anal tissues. Operation, August 7, 1916. Perineal extirpation of the last five inches of the rectum, including the sphincters and a broad margin of tissue lateral and posterior to the rectum. The upper rectum, brought down and sutured to the skin margin, primary healing. He left the hospital on the eighteenth day, now feels well and his weight has risen to 161 pounds. He has three or four formed stools daily but only fair control, as the sphincters had to be sacrificed. Histologic diagnosis—squamous celled epithelioma of anus.

There is no evidence of recurrence at this writing. Apart from hemorrhage occurring in the desquamation or ulceration of tumors and stricture, is the bleeding from ulcerative proctitis and colitis. Except in hemorrhagic colitis, the bleeding is not characteristic and is mixed with and often obscured by mucus and pus. At their beginning some of these ulcerations present a characteristic picture when viewed through the proctoscope—as simple chronic, follicular, luetic, gonorrheal, tuberculous, amebic, bacillary, etc. After a time secondary infection of the ulcers occurs and one sees only a diffusely ulcerated mucosa covered with mucus, pus and blood. Several of these varieties may be differentiated by proctoscopy and microscopic examination of the scrapings from the ulcers. Hemorrhagic colitis, however, merits special notice. This is a rare condition which has been studied only comparatively recently and is probably of infective origin. The main symptoms are loss of weight, weakness, anemia, and diarrhea with many foul passages, ten to twenty daily, containing some mucus and pus, but mostly blood. The proctoscope shows a typical bosselated mucosa, exuding blood freely. The entire colon is involved, and sometimes all its coats. This condition must be differentiated from other forms of ulcerative colitis. Here is an interesting example of hemorrhagic colitis:

CASE III.—H. B., aged seventeen, seen November 13, 1915. He was always strong and healthy until two months before. He then began passing blood from the bowel. He had ten to fifteen evacuations of bright blood daily, and blood was mixed with the stools. No pain or protrusion, growing weak and anemic, temperature normal. No lesions of anal canal. Proctoscope showed much thin bloody discharge in the bowel. Mucosa everywhere was superficially ulcerated, no areas appearing normal. Under local and constitutional treatment his condition improved so much that for six weeks he did not return to the clinic. At the end of January, 1917, he had a relapse and was worse than ever. He was admitted to the hospital, his weight being 124 pounds, as against a normal of 145 pounds. The stools were negative for ameba, germs of bacillary dysentery and tubercle bacilli. Blood cultures were sterile and blood tests for lues, typhoid and paratyphoid were negative. Hemoglobin was 70 per cent. During the next fortnight melena continued with rapid loss of strength and weight, the latter falling to ninety pounds. The hemoglobin was 30 per cent., red cells under 4,000,000, leucocytes 12,000 and polynuclears 62 per cent. He then received an intravenous transfusion of 250 c.c. of citrated blood from his brother and during

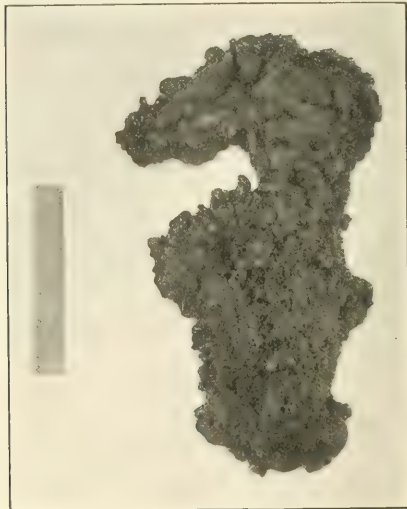


FIG. Papillary adenoma of rectum.

stant ooze of blood and, later, infection that may be the beginning of a fistula. Hemorrhoids may give a sense of smarting weight or fullness, but are not painful unless prolapsed, thrombosed or inflamed.

Pain accompanying hemorrhoids usually connotes a fissure, the pain of which is characteristic. It begins with the passage of the stool and lasts from a short time to several hours thereafter. A few drops of bright blood follow the movement and the stool may be blood streaked. Prompt and proper treatment is important to prevent its sequelæ: spasmodic sphincter, constipation and alimentary toxemia, or abscess followed by fistula, or reflex symptoms referable to other organs or to the nervous system. Fissure is also to be differentiated from other lesions of the anus characterized by pain and bleeding, notably blind internal fistula, chancre, condylomata, tuberculous ulceration and epithelioma.

An instance in which epithelioma was mistaken for a fissure was this case:

the next four days the hemoglobin rose to 45 per cent. Two weeks later a second transfusion was done of 250 c.c. of blood from his father. From this time, both general and local improvement was rapid and progressive. Enterorrhagia ceased, the ulcers healed, strength returned and his weight rose during the next three months to 146 pounds. After being apparently cured for three months, he had a mild relapse in November, 1916. Since then he had no treatment till he returned to the clinic in January, 1918. He now has five to six stools daily, containing a little blood. A few superficial ulcers are present on the intestinal mucosa. The etiologic factor remains undetermined but the probability is that there was a blood dyscrasia induced by infection. The outstanding fact is that the blood transfusions saved his life.

Displacements of the bowel.—Prolapse of the rectum, partial or complete, as already described in children, occurs also in adults. A complete prolapse of the first or second degree, i. e., one that protrudes, frequently bleeds when not reduced promptly. Intussusception of the sigmoid in adults frequently has a characteristic syndrome simulating chronic intestinal obstruction. Bleeding is less frequent than in the same condition in children, and its source is to be recognized only by instrumental examination. Bleeding is given as a symptom in eighty per cent. of cases of acute intussusception and in forty-five to fifty per cent. of the chronic form. In intussusception at higher levels, most commonly the ileum into the colon, the other symptoms characteristic of intestinal obstruction, plus an abdominal tumor and a sausage-like mass felt per rectum, explains its source. A polyp in the terminal ileum may be its exciting cause.

Varicose veins.—When examining the bowel mucosa by the illuminated tube, one is frequently impressed by the prominence of the veins which evidence portal obstruction. Occasionally these varicose veins become thrombosed, ulcerate and rupture, giving rise to an alarming hemorrhage.

CASE IV.—A striking example of this was the case of Mr. S., a painter, aged thirty-five, seen at the Presbyterian Hospital, January, 1918, suffering from chronic lead poisoning. Twenty-four hours before he had passed about one litre of dark blood with a few newly formed clots. Examining finger felt a doughy mass extending upward two and a half inches above the sphincters over the prostate. The proctoscope was introduced and the old blood wiped away, showing a normal mucosa everywhere except over the swelling noted, which appeared red like a cock's comb. A half inch slit was detected in the mucosa through which an alligator forceps was introduced, withdrawing blood clot, and so explained the hemorrhage.

Embolism of the mesenteric arteries is a very grave and, usually, fatal condition associated with endocarditis and valvular disease or atheroma of the aorta, while thrombosis may be due to a local endarteritis, calcareous glands, or injury. Hemorrhage from the intestine is given as the leading symptom of embolism of the superior mesenteric artery, in the majority of cases, but a large group simulates intestinal obstruction. Occasionally, after a local endarteritis obliterans of a small branch of the mesenteric artery, embolic or thrombotic ulcers of the intestinal walls develop and may have hemorrhage as a symptom.

Tumors.—The only histologic difference between polypi in children, mentioned above, and multiple adenomata in adults is a greater proportion of

glandular tissue in adults, and of more connective tissue in children. They are located most commonly in the rectum, but may extend throughout the colon, or be in the ileum, region of the ileocecal valve, or in the duodenum. Constipation may be an early symptom, but is soon succeeded by diarrhea with blood and mucus and tenesmus, loss of weight, anemia, etc. Histologically, these tumors are benign. Without suitable treatment they are malignant clinically and, in fact, become truly malignant in two to three years in nearly half of the cases investigated. The exciting cause of these numerous small growths would be of academic interest only were it not for its bearing on the prognosis. Clinical experience, I believe, justifies the opinion that most of these tumors are inflammatory in origin. As evidence of this is the frequent history of dysentery or colitis preceding the development of adenomata.

Positive evidence of the rôle of irritation in the causation of multiple adenomata is also furnished by therapy. In some cases retrogression and disappearance of the growths has followed the removal of the irritating substances by colonic lavage. In other and more resistant cases, diversion of the fecal current and irrigation have been efficient. In illustration:

CASE V.—Mr. T., aged thirty, was referred to me in August, 1913. Fourteen months earlier he had suffered an attack of diarrhea, lasting four months, relieved by medical treatment. He remained well about six months when the diarrhea returned and had persisted four months when he visited me. Movements then occurred hourly by day and once to three times at night, and contained considerable mucus, pus, and blood. His weight loss was ten pounds; he was anemic and felt very weak. Proctoscopy showed typical multiple adenomata. The growths were mostly sessile, varied in size from a pea to a hazelnut, and extended beyond the reach of the tube. During the next month he lost ten pounds in weight in spite of local and constitutional treatment, and I then did an enterostomy in the transverse colon (transverse colostomy), no tumor being palpable above the sigmoid. Unfortunately, when the bowel was opened on the fifth day, it was found that the adenomata extended to the hepatic flexure and presumably to the cecum. By irrigations through the colostomy the greater number of growths below the artificial opening disappeared, while retrogression occurred in those remaining. Those growths above the colostomy were to a lesser degree influenced by the operation, yet the patients' bowels acted only once to three daily. He regained his weight and health, and has been free from diarrhea and was regularly employed as an elevator man for three years thereafter. There was no evidence of malignancy.

Large, solitary, adenomatous growths of the sigmoid and rectum are of great clinical interest because of their liability to malignant transformation. I have reported (1) a case of solitary polyp of the rectum in a gentleman aged seventy-six years which had become an adenocarcinoma. An illustration of the second clinical comment is the following case:

CASE VI.—E. K., widow, aged seventy-seven, always well till one year before consulting me in October, 1917. During the previous year she had had progressive diarrhea, six to ten stools daily, accompanied by blood and mucus, accompanied by tenesmus and protrusion. Movements always accompanied by blood and mucus. The growth was found by proctoscopy and was removed by the sigmoidoscope. The growth was a large, solitary, adenomatous growth of the sigmoid, which had become an adenocarcinoma.

ed. Physical examination of chest and abdomen was negative. Blood pressure, systolic 110, diastolic 80. Hemoglobin 80 per cent. Rectal examination: Tumor began just above internal sphincter on left side and extended spirally up about five inches, as far as finger could reach. Proctoscope, passed into sigmoid, showed a pale but otherwise normal mucosa. An x ray of the colon revealed no other defects. Biopsy showed the growth to be papillary adenoma. On November 7, 1917, the tumor (see Fig.) was removed per anum by passing sutures through the healthy mucosa and dividing the pedicle in sections after each suture was tied.

Recovery was uneventful, the patient leaving the hospital on the fourteenth day. A linear scar of about five inches now marks the site of the growth. Patient's bowels act once or twice daily. She has gained four pounds in weight and is feeling strong and well.

Adenomyoma of the rectovaginal septum is an unusual benign growth, having melena as the leading symptom. The only case of which I have knowledge was this one:

CASE VII.—Mrs. V., aged thirty-seven, mother of two healthy children. She consulted me in September, 1916, for rectal hemorrhage and pain. Menses were painful and the flow gradually ceasing, no leucorrhoea. Prior to three years before she was always constipated. She then had an attack of diarrhea lasting five months. Thereafter intermittent attacks occurred, and, during the past year, stools had averaged ten to twelve daily, containing fresh blood and mucus. During the past three years she had pain over the lower sacrum, aggravated at the menstrual period and with the diarrhea. Physical examination was negative except the local condition. Hemoglobin, 85 per cent. Wassermann of the blood, negative. Rectal examination: Three and a half inches up on the anterior rectal wall, just above the cervix uteri, the finger felt a hard, fixed, fairly tender mass, the limits of which could not be very clearly defined, and on which the overlying mucosa was not movable. The proctoscope showed a superficial ulceration, the size of a quarter dollar, at the rectosigmoidal juncture which was red and clean and bled freely on contact. Vaginal examination: Uterus normal in size and position and movable. The lateral fornices were clear, but in the posterior fornix was felt the same hard, tender, slightly movable mass, the size of a guinea hen's egg, as felt per rectum. Operation on September 26, 1916. Left rectus incision. The tumor was located in the anterior wall of the sigmoid, just above its juncture with the rectum, and extended downward two inches onto the rectum, cervix uteri, and posterior vaginal wall. Lower third of sigmoid was mobilized, including a small portion of the posterior wall of the uterus and its cervix, and the superior hemorrhoidal artery was ligated. The abdominal wound was then closed, and, in the lithotomy position, the operation was completed by a typical Quenu-Tuttlire extirpation of the rectum, including the posterior vaginal fornix, one and one-half by two inches, which was involved in the growth. The sphincter ani was preserved and the sigmoid sewed to the perineal skin, thus forming the new rectum.

Patient left the hospital three and a half weeks after operation and is well, having normal anal sensibility for bowel actions, which now occur once or twice daily with normal control. Vaginal and rectal examinations show no abnormalities. The pathologist's report on the tumor was adenomyoma of intestinal origin.

Malignant tumors.—Of malignant tumors, sarcoma of the rectum practically never occurs, while in the colon it is rare, and hemorrhage is not a prominent symptom. On the other hand carcinoma is very common. According to the United States Census of 1910, in 17,000 cases of cancer in all parts of the body, twenty-four per cent. occurred in the stomach, and 3.3 per cent. in the rectum. In other words, one cancer in every thirty is rectal, and

in the gastrointestinal tract the rectum, is, next to the stomach, by far its commonest site. In view of the well authenticated progressive increase in cancer, it behooves every physician to do his utmost to detect this disease at its incipency, for then alone in this location is it amenable to the only present known means of relief or cure, namely, radical excision. Unfortunately there is no one symptom or group of symptoms characteristic of early cancer of the colon or rectum. However, it is worthy of note that in a large series of cases in which careful inquiry was made as to the earliest symptoms, the passage of blood alone, or blood with mucus, with or without other symptoms, occurred in nearly forty per cent. of the cases. The passage of blood therefore is a first symptom in over one third of all cases of cancer of the large bowel.

Occasionally the source of intestinal bleeding baffles diagnostic skill. Autopsy findings and exploratory operations have revealed the lesion in some of these obscure cases. For example, isolated varicosities of the small intestine and small arterial aneurysms of the intestinal wall occasionally cause a puzzling enterorrhagia, while a ruptured aneurysm of the branches of the hepatic artery may pour blood through the bile passages into the intestine. In a number of cases collected by Naunyn, gallstones were the exciting cause of this accident. In patients dying of phthisis, Nothnagel found large quantities of clotted blood at autopsy in the intestines at points far above the ulceration and in some cases even when no ulceration was present. The reason assigned by Lichtenstein, and others, for some of these vague hemorrhages is "a nutritional disturbance of the vessel walls, caused by failure of one of the most important factors in metabolism—the functions of the liver."

CASE VIII.—On August 27, 1914, there was admitted to my service at the hospital a man aged seventy-nine years, who said he had had an intestinal hemorrhage of two to three pints twelve hours before. There was nothing important in his previous history. He had progressive constipation relieved by cathartics and occasionally retention of urine. Physical examination showed a man of large frame, fairly well nourished, but visible mucous membranes pale, skin sallow and feeling very weak. Tongue was coated, chest negative, old right inguinal hernia, abdomen soft but tympanic, bladder distended, temperature normal, urine negative. Blood examination: Reds 4,000,000; leucocytes 30,000, polymorphs 89 per cent., lymphocytes 11 per cent., eosinophiles 1 per cent. By rectum the prostate was symmetrically enlarged and the proctoscope showed the mucosa covered with a film of blood clot and much fluid blood in the bowel lumen. He retained no nourishment. Another large hemorrhage occurred on the second day after admission, also on the third and fourth days and he expired on the fifth, after the loss of about three pints of blood.

At autopsy no fluid was found in the peritoneal cavity. There were no tumors. The entire colon was bluish black in color. The stomach and entire small intestine were very pale. Descending colon and sigmoid were studded with hazel nut size old diverticula. The entire mucosa of the colon was covered with a film of blood and a small quantity of dark fluid blood was present but no formed feces. The mesenteric vessels were not thrombosed. Microscopic sections of the colon showed acute inflammation. In this case it would seem that an acute infection must have occurred. Further research in hematology and the collated findings of many thorough autopsies may shed needed light on the causation of such fulminating cases.

These instances of obscure causation are cited as a warning against hasty, ill advised exploratory

operations on patients with bleeding from the bowel as practically the only symptom. The clinical picture is such that, in the desire to do something, one is tempted to advise operation. I have seen the abdomen opened in a number of cases of single large intestinal hemorrhage. The findings were absolutely negative. Frequently no further bleeding occurs with or without operation. It is much safer to employ expectant measures until a diagnosis is made and definite indications for surgical intervention develop.

REFERENCE.

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PYORRHOEA ALVEOLARIS FROM THE MEDICAL STANDPOINT.

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Pyorrhœa alveolaris has long been regarded as a specific disease in one of three senses. Like measles and the exanthemata generally, it is due to a definite but undiscovered germ. As in the case of cancer, scarlet fever and, until the discovery of the spirochete pallida syphilis, individual authors claimed a special bacterium or other microorganism which was not generally accepted. Recently, an amoeba has been quite generally recognized as the specific cause, but there is considerable evidence that the amoeba is a mere accidental parasite, generally present and practically harmless. The writer does not take sides in this issue, except to point out that it does not seem necessary to regard the amoeba as the essential cause of pyorrhœa and that if it is finally proved to be such, this paper must be regarded merely as dealing with predisposing causes and not as actually explaining the process. Irrespectively of specific microorganism, whether one or more bacterium or whether nonbacterial microorganisms are directly responsible, pyorrhœa has been regarded as specific in the sense of requiring a peculiar metabolic condition of the system with local effects.

The writer is neither a dentist, histologist, bacteriologist nor pathologist. The relation of the teeth to digestive diseases in general and the same opportunities for observation of cases and consultation with dentists which any physician might enjoy are his sole qualifications for discussing the subject. These qualifications do not suffice for an authoritative presentation of a theory but may, if charitably viewed, allow a suggestion of conservative adherence to general pathologic and practical considerations in forming an opinion of the nature of pyorrhœa.

Pyorrhœa occurs in successive generations and in collateral members of a family. The relative frequency of the disease and of exceptions justify scepticism as to whether any definite hereditary or familial tendency exists, as in the case of tuberculosis and cancer. It occurs more frequently as age advances, but there is no constant relation to any given period of life and no relative correspondence to senility in general nor to any one mark of senility. Age seems to operate rather as in the case of can-

cer, diabetes, and various degenerative diseases, by affording time and incidental causes for development. So far as an impartial consideration of cases allows an opinion, pyorrhœa is not definitely associated with any given metabolic disorder, as, for example, the development of a state of local acidity or a tendency to the deposition of definite saline substances. It is, of course, associated with local conditions of atrophy of the supporting structures of the teeth and with necrotic and pyogenic conditions of these structures and caries of the teeth themselves, or, perhaps it would be more correct to say that it really consists of such processes but there is no positively demonstrated relation to identical processes throughout the body generally.

Now, taking the histological basis for pyorrhœa, the problem becomes not so much one of explaining the development of pyorrhœa as of explaining why it does not invariably develop. Indeed, while we must grant that such development varies greatly and inexplicably in different individuals and may occasionally fail entirely, it is generally true that if life is sufficiently prolonged, the constituent lesions of pyorrhœa do develop in practically every one.

The teeth are the sole instances in the body of the protrusion of osseous, or, more generally, mesoblastic tissues, without a protective epithelial covering. The similar exposure by traumatism of any other mesoblastic tissues, without artificial protection inevitably results in necrotic and pyogenic processes essentially identical with pyorrhœa. It is true that, as erupted, the teeth are covered with epithelium, but this is soon removed by inevitable attrition. The place of epithelium as a protection from exogenic enemies, mechanic and microorganismic, is taken by the enamel, a dense and germ tight layer of almost pure mineral matter. The reference to the teeth as osseous organs is not a mere superficial simile, for their main mass consists of dentine which differs from true bone only in comparatively minor details of histologic arrangement. The teeth, indeed, may embryologically be considered as ossified dermal papillae. Dentine is, on account of its histologic difference from typic bone, slightly more resistant to caries. Thus, in animals with continuous growth of dental structures—rodents—and herbivora, in the ordinary sense, whose diet does not favor the development of pyogenic and saprophytic bacteria, the dentine may be exposed without resulting in caries, and, in human beings whose mouths are artificially or by natural cellular action protected against the development of virulent bacteria, the dentine may be exposed without the development of caries.

The enamel gradually diminishes in thickness until its disappearance at the constricted neck of the tooth, which normally coincides with the line of attachment of the gums. At the same time the cementum develops and covers the dentine of the root. Cementum is a still further specialized and still denser and more resistant form of bone, covered with the periodontium, analogous to periosteum, whose exterior unites with the connective tissue of the gums.

It requires no assumption of a specific microorganism or of a peculiar pathologic process to explain the logical occurrence if the line of division

between the protection of enamel and of protection by gum epithelium—gum connective tissue merging with periodontium and that in turn with cementum—becomes a zone of appreciable though still minute width. Bacteria colonize exactly as they would upon exposed, denuded bone and, barring minor differences in local conditions, the same caries of bone occurs, with pyogenic involvement of the soft parts, development of a sinus occurs, with greater or less literal pyorrhœa and the process may extend to the alveolar arch and thus involve true bone. Ultimately, we may even have septic thrombi form in vessels or the septic process may extend to the antra and it is not entirely a theoretic assumption that a general septicæmia may occur. Acute appendicitis has been noted following dental caries or pyorrhœa in the limited sense. Mastoid abscess, hepatic abscess, quinsy, so called idiopathic sepsis in general, including even what is designated malignant endocarditis, without apparent cause, may reasonably be ascribed to the development of virulent strains of bacteria in and about the roots of teeth. Recently, the writer has observed what was called rheumatism following mumps in an adult. The patient most certainly did not have either of these diseases in the common acceptance of the terms, but he did have a septic polyarthritis and pneumonia, the tonsils were not affected but there were found abscesses of the sublingual and submaxillary glands and there was a moderate pyorrhœa alveolaris, though with little actual pus. Some years previously there had been an acute septic appendicitis. The only other explanation of the ultimate septic element, which resulted in death, was a small, quickly healing cut of the finger from a piece of paper.

Is it necessary to assume any special metabolic condition to prepare the way for the implantation of bacteria at the fine line of division between protection of dentine by enamel and by gum epithelium and subjacent connective tissues, periodontium and cementum? Many dentists have emphasized acidosis, mainly on the ground that a strip of litmus may be reddened when applied to the gums. But this phenomenon is not constant in pyorrhœa, and it may be present when pyorrhœa does not exist, when indeed the gums are normally attached. There are cases in which the retraction of the gums may be explained by the atrophy incident to arteriosclerosis but there is no close and general coincidence of pyorrhœa and arteriosclerosis. So far as the writer's observation goes, there is no necessary association of pyorrhœa with any given disease usually designated metabolic.

If we consider the well known mechanical and thermic traumatisms producing lesions of the enamel which lead to dental caries of the crown, it requires no argument to show that these are by no means limited to the protruding portion of the tooth distant from the line at which enamel gives place to cementum. Those due to crushing of hard particles do not, of course, involve the neck of the tooth but the caries may extend to this line while the vulnerations of dental instruments, thermic expansions and contraction and a variety of minor traumatisms may act especially where the enamel is thinnest. Granted the beginning of caries of the dentine, at or near the line where cementum begins,

its extension along the root to connective and strictly osseous tissues, with the formation of a sinus marked by pyorrhœa in the literal, symptomatic sense, is a logical result.

Viewing the condition from the standpoint of the gums, the same general fact is true. Arteriosclerosis or any other condition, such as anemia or a reflex ischemia, producing a more or less temporary atrophy of the gums, exposes a vulnerable zone of the tooth. A foreign body or a seed, or scale or any similar indigestible, dense food ingredient, a toothpick, a thread used to prevent caries but suddenly slipping from between closely opposed dental crowns and wounding the gum, the application of a dam in treating existing caries by filling, the exploration of the dental necks by a metallic instrument, a large variety of similar accidents, may either wound or strip the gums from the teeth. Acids taken medicinally, vinegar, organic acids produced by fermentation may attack the teeth in a minute area between the normal protective coverings or bacteria of caries may act directly. It makes little difference whether the septic process is initiated in the dentine itself—and even the cementum is not absolutely resistant—or whether the focus is a pocket accidentally or pathologically established between the neck of the tooth and the gum or rather in the tissues of the gum itself, the results are the same, and the process tends to extend, both by continuity and contiguity of tissues and by inoculation of independent niduses accidentally established. Even the means prophylactic against oral sepsis primarily distribute infectious elements and a tooth brush bristle is often the first lever prying apart the tooth from its connective tissue investment. At the risk of seeming puerile, it may be emphasized that, so far as relative sizes are concerned, a bristle may be compared to a crowbar prying the earth from the root of a tree and allowing the entrance of a mass of seeds.

It should be remembered that the word specific as applied to bacteria is somewhat arbitrary. We use it for bacteria whose implantation produces a readily and clinically diagnosable disease. Any given septic bacterium is really equally specific. To some degree by macroscopic appearances and to a distinguishing degree by methods of cultivation and exact analysis, each septic bacterium is to be considered as specific in the same essential sense as such a germ as the bacillus tuberculosis. It is quite conceivable that a given case of pyorrhœa may be specific in the sense that some one germ is especially concerned, and one cannot deny the possibility of all cases of pyorrhœa being referable to some one paramount germ, bacterial, ameboid or otherwise classified. This is not, however, a necessary assumption, and it does not seem probable that pyorrhœa is more definitely specific than sepsis elsewhere located.

It must apparently be admitted that the amœba is frequently, possibly invariably present in pyorrhœa. The present indication is that it is not the essential cause, and that its destruction by emetine or any other agent is not curative. A vaccine, properly representative of the infectious element or elements present in any given case of pyorrhœa will undoubtedly influence the disease favorably, to the degree that a similar process anywhere may simi-

larly be influenced, but it does not seem probable that any such treatment will prevent the further action of the same or different septic elements upon vulnerable tissues. Oral assepsis and antiseptics, removal in bulk of infectious elements, their pabulum including tissues which they have destroyed will undoubtedly have an immediately favorable action, but it is very unlikely that a permanent effect will be produced so long as what amounts to denuded bone remains. The essential condition in pyorrhea seems to be the presentation of a vulnerable line between enamel and gum epithelium and its subjacent tissues as already enumerated. There is an almost inevitable tendency to the development of such a line and to its increase into a zone of appreciable width. It seems improbable that this tendency can invariably be prevented or that the process, once established, can always be checked at any given stage. Well established principles, applicable to the strictly abnormal exposure of osseous tissues, are of great value, and dental applications of these can undoubtedly delay the process with preservation of the teeth in a more or less mutilated and artificially protected condition for a long time, but the ultimate cure is unfortunately, in analogy with the healing over any other exposed osseous structure because this implies the sacrifice of the teeth.

THE TREATMENT OF LEG ULCERS.*

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When confronted with an ordinary leg ulcer due to varicose veins the cardinal principles of treatment are sterilization of the ulcer and support. Congestion has been termed the first stage of inflammation: to relieve this congestion put the patient at rest in bed and elevate the foot. To sterilize the ulcer smear its surface and recesses with twenty per cent. solution of dichloramine-T dissolved in chlorocane and leave the ulcer open, exposed to the air, keeping the bedclothes away from it with a cradle. Over the ulcer itself there may be applied a wide mesh paraffin mosquito netting. Every twenty-four to forty-eight hours dichloramine-T in five per cent. solution is applied to the surface of the ulcer. Soon healthy granulations spring from the base of the ulcer and fill its cavity flush with the surface, the degree of sterilization being determined by the bacterial cell count. If the ulcer is large it is now ready for skin grafting, the best method being that proposed by Steele, in 1870. The grafts on the ulcer are allowed to heal while exposed to the air, being protected from the bed clothes by a basket made of wire netting.

If the sterilized ulcer is small it is best treated by the calomel adhesive plaster method (1). The ulcer surface is dusted with calomel and covered with strips of adhesive plaster firmly applied from below upward, renewed from two to three times a week. These strips compress the granulations, preventing their becoming edematous. The strips also promote luxuriant growth of epithelium from the ulcer edge, and it is not long before the ulcer is cured. With

this calomel adhesive plaster method there is no reason why the patient should not be up and about.

Most leg ulcers will yield to these simple methods; those that do not yield, require additional measures. Sometimes the simple Nussbaum incision suffices. Here a circular cut is made about two centimetres from the margin of the ulcer, the object being to overcome the venous stasis at the edge of the ulcer. The circular incision is closed with interrupted sutures of horsehair. In other cases the ulcer does not heal because of complications such as underlying osteoperiostitis, syphilis, and cancerous degeneration (Mariolin's ulcer). Excluding syphilis, these complications are dealt with by cleaning up the sores by the sharp spoon and cutting away the mortified skin with scissors, removing all necrotic tissue and all tissue whose vitality seems diminished, then promoting cicatrization by efficient treatment of the wound.

In certain cases the electric dry air oven helps: here the limb is baked in a temperature of 250° or 300° F. for from twenty to thirty minutes; the number of treatments averages three a week.

Smits (2) believes that the only modern surgical method of treatment of varicose ulcers that reckons with etiology is local treatment of the ulcer combined with stretching or laceration of the nerve, in the territory of which the ulcer is situated. The following nerves come under consideration for nerve stretching in the neighborhood of the ulcer: a, internal saphenous; b, external popliteal; c, external saphenous. The technic followed in exposing these nerves is the same as that suggested by Chi-pault (3). At times teasing the sciatic nerve into separate fibres must be performed, always selecting the classic spot at the lower border of the gluteus maximus.

Attention must also be directed toward the varicose veins; for routine treatment of the average case, Unna's zinc oxide gelatine paste stocking serves as an admirable and efficient support. When the ulcer is cured the Randolph bandage or silk elastic stocking will be found useful. In suitable cases operation may be performed. The most pathologic condition of the leg is the varicose vein. This operation is founded on sound principles and gives as much as can be attained by any method of extirpation, cure resulting in eighty per cent. of the cases treated by Madelung's method. The varicose perforating vessels may be dealt with by being picked up and tied one by one, after the method of Novaro.

After all, any method of treating leg ulcers is efficient which pays due regard to the fundamental pathological etiology of the lesion. I emphasized this point in a previous paper (4) and Smits must have felt very much the same about the matter, for he says (2): "The extensive, nearly endless, literature on chronic ulcers of the leg, the laudatory commendations of continually renewed remedies, prove to be a waste of time. The only serious and ointments puts us off the track."

*Read before the Philadelphia County Medical Society, April 10, 1918.

PREPARATION OF SOLUTIONS OF SALVARSAN AND ARSENOBENZOL FOR INTRAVENOUS USE.

BY HERMAN GOODMAN, M. D., B. S.,

New York,

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The need for a more widely spread knowledge of the technic for easily preparing solutions of Schamberg's arsenobenzol for intravenous use in considered sufficient reason for this communication. At this time, because of the advent of a more easily soluble product bearing the old German name, it is especially desirable to vote down the lie that the Philadelphia product is very difficult to get into solution. Clinical experience has taught that arsenobenzol of Schamberg is as efficient as the original drug, with the added advantage of being practically nontoxic. It certainly would be a decided loss if the practitioner, awed by the much overrated difficulties of getting arsenobenzol into solution, should cease to use the drug.

The preparation of salvarsan or its equivalents begins with the cleansing of the glassware. The necessary cylinders, gravity tubes, and funnels are washed twice with soap solution, using a long handled brush. They are then rinsed in running tap water, and again in distilled. After drying, the glassware is baked in a sterilizer at 160 degrees centigrade for thirty minutes. There is no doubt that this procedure, oft repeated, is wearing on the glassware, but cleanliness above all things in intravenous work is essential. Wet sterilization is less desirable. Distilled water should be used to boil the glassware, otherwise a film of deposited salts and dirt is evident. The mixing cylinders should be drained as dry as possible before use. Rubber tubing, if new, should be boiled several times with at least three changes of water to remove the powder both within and without. Tubing once used should be rinsed thoroughly before boiling.

The water used for salvarsan solutions is freshly distilled, and not more than six hours old. Although the modern stills deliver sterile water, we boil all water for seven minutes.

The sodium hydroxide is a fifteen per cent. solution prepared with freshly distilled water, and sodium hydroxide sticks that are free from the sodium carbonate and sodium bicarbonate which forms if the sticks are exposed to air. We have kept sodium hydroxide solutions in closed bottles and have never failed after a few days to find a granular or amorphous type of precipitate. At one time, we thought that this meant a fungus growth, but culture on Sabouraud's medium was negative. Microscopic examination disclosed no spores, nor any crystalline forms that could be recognized. The suggestion that the precipitate was the result of the basic action of the solution on the surface of the glass containers has not appealed to us because the bottles never became cloudy. Freshly prepared solutions free us from any deep concern, and we have seen solutions with a heavy precipitate in the bottom of the container used with no ill effect.

The salvarsan ampoules are taken from their wrappers and put into a dish of alcohol. Airtight

tubes float, but tubes that are defective and have admitted air, sink, or the alcohol reaches the inside of the tube and moistens the powder. No tube that does not float is used. The tubes are dried with sterile gauze, as is the alcohol sterilized file, before the tubes are opened. When using salvarsan, neo-salvarsan, diarsenol, neodiarsenol, or novarsenobenzol (Billon), the ampoule is readily opened by scratching the neck with the file and smartly tapping the far end. This method is not desirable with ampoules of arsenobenzol of Schamberg because the powder of this arsenobenzol has great cohesiveness and comes from the narrow neck with comparative difficulty. We open Schamberg's tubes down on the body of the ampoule, and the powder drops out easily. If it fall to the bottom of the cylinder as one mass, it is wise to shake the cylinder from side to side and break up the lump.

Water is now added to the powder, using approximately five c. c. to the decigram. For ease in bringing on solution of Philadelphia arsenobenzol, this water should be bubbling, boiling hot. Shaking for a minute is all that is necessary to bring about solutions of all products except Schamberg's. His arsenobenzol requires vigorous shaking for at least five minutes for the beginner, but with experience the time is reduced to a minute and a half for a complete clear solution. One should always release the stopper from the cylinder for a moment after shaking to permit the heated air and liberated gas to get out, otherwise they are likely to force the stopper out and literally shoot some of the solution along. We advise against the use of the technic, especially for Schamberg's product, which advocates dropping the powder on the water which is first measured into the cylinder. We have never been able to get a complete solution with this method.

Sodium hydroxide solution is now added to solutions of salvarsan, diarsenol, or arsenobenzol, and we delay the gradual drop by drop method until the neutral point is almost reached. We shake usually after each addition of alkali and determine this by the speed in which the precipitate is formed. We have observed that the slower the alkali is added, the more precipitate is formed, and on one occasion the precipitate filled the entire cylinder. On further addition of the hydroxide solution, the precipitate dissolves. The cylinders should be shaken slowly and a slight pause made before further alkali is added as this feature is noted. Often the drop of sodium hydroxide that was thought necessary is discarded after this precaution. The final neutral solution is absolutely clear. If the first solution is not complete and alkali is added, there will always be undissolved particles in the cylinder even when the neutral point has been reached. It is very easy in such incompletely dissolved cases to overalkalinize unless we filter before attempting to neutralize.

On several occasions, we have determined how near neutral our solutions were by the following test: A tube of salvarsan or arsenobenzol is dissolved and neutralized, the number of drops of sodium hydroxide needed being counted. In another cylinder, a second tube of salvarsan or arsenobenzol is dissolved. This acid solution is poured into the cylinder of neutralized solution. If a precipi-

tate forms, it proves overalkalinization of the first tube. We count the drops of sodium hydroxide necessary to neutralize the joint solution, and find that it requires about four or five drops less. In other words we had overalkalinized the first tube by half this number of drops. Such a procedure should be carried out if a solution is unintentionally overalkalinized, and both tubes of the drug could be utilized. It is possible to render the solution acid again with dilute hydrochloric acid, but we have never had occasion to use it. It is impossible to get a good solution if salvarsan powder is added to a neutralized or alkalinized solution of the drug.

We have compared the amount of alkali necessary to neutralize salvarsan and arsenobenzol. The popular opinion has been that arsenobenzol required more sodium hydroxide, and we found that this drug required about one third more than salvarsan, sustaining this belief. We have no comparative notes for diarsenol.

We ordinarily use for injection, twenty c. c. of fluids to the decigram. At one time, this second dilution was done with saline, but now we use sterile water, and find no ill effect. It has been our purpose to learn the tonicity of salvarsan solutions of various dilutions as compared with red blood cells, but no opportunity has presented itself as yet. Exceptionally, we have given salvarsan concentrated to ten c. c. to the decigram, but unless used as a time saving measure in a dispensary, for example, we hesitate to recommend it, and cannot deprecate too much the method of injecting five decigrams in a total of ten c. c. or twenty c. c. which has recently been described. This method has been used, and the endophlebitis which it causes, renders the vein unfit for further injection. If any solution injected is highly alkaline, it causes a temporary hardening of the vein, and it may be several weeks before it can be used again. In cases where there is only one readily accessible vein, such a mishap may cause unnecessary inconvenience.

For the injection proper, take a single gravity tube of 250 c. c., nozzle tip at the bottom, and rubber tubing about five feet long. A window of glass tubing may be inserted. At the end of the rubber tubing is a male connection which fits the slipon hilt of the Fordyce needles. The entire apparatus is suspended with its outlet tip about two feet above the level of the vein into which the needle is to be introduced. Water is first run through the gravity tube to displace all the air, and create a complete water system from a visible level in it to the end of the tubing. A pinch cock clamp on the rubber tubing holds well enough, and does less damage to the rubber than does an artery clamp. The solutions are always filtered through wet gauze from the mixing cylinder to the gravity tube. If dry gauze is used it is very possible for a few loose ravelings from its under surface to be washed into the filtrate. The solution should not vary very much either above or below blood heat. It is not necessary to use a thermometer, judging by the warmth of the cylinder with the hand suffices.

Skill in getting into veins with needles comes only with practice. Any technic that does the work is a good one. Of course, it is very desirable to get into a vein without much fuss, and to be certain

about it, so that infiltrations come not at all, or with pleasing infrequency. The uninitiated should first take a number of bloods for Wassermanns before attempting salvarsan injections. This training will avoid some painful experiences.

The proper preparation of the patient will also give satisfaction in sparsity of reactions. No patient receives an injection whose bowels have not been emptied by a cathartic taken the night before. (Omitting the meal previous to the time of injection is also of value, and in many cases it is wise to caution the patient against eating within several hours after. Patients often say this routine is un-



necessary, and that they eat with impunity both before and after the injection. On the contrary, a few delayed reactions have been reported, that is, feeling of malaise, sick to the stomach, vomiting, and in one case, diarrhea, which the patients laid to having disregarded these instructions.

It is best in all cases, except in primary lues, where the abortive cure is attempted, to precede the intravenous injections of salvarsan by one or two intramuscular injections of mercury. This procedure reduces the possibility of the Herxheimer reaction, which is the manifestation of the presence of the body to the presence of the spirocheta pallida. Skin and mucous membrane lesions appear brighter, and the pains and aches of specific origin become more marked.

Our experience is that patients with central nervous lesions and specific disease of the vascular system need an amount of repeated doses, more than the small number of doses of five decigrams, for instance. Patients with one kidney, or with impaired renal organs, may also be given doses not greater than three decigrams with safety.

Medicine and Surgery in the Army and Navy

THE EXCESSIVE VENEREAL RATE IN OUR ARMY.*

BY WILLIAM T. BELFIELD, M. D.,

Chicago,

Professor of Genitourinary Surgery, Rush Medical College.

From 1906 to 1911 the average venereal incidence of the United States regular troops at home was about 150 men per 1,000 per year; that of the Prussian home army during the same period averaged about nineteen. Since the official adoption of the prophylactic treatment in 1912 the venereal rate of our home army has averaged about ninety. Prior to the present war the venereal rate in various foreign armies ranged about as follows: Italian, seventy-seven; British, sixty-four; Russian, sixty-three; Austrian, fifty-four; French, twenty-four; Japanese, twenty-four; Prussian, nineteen; Bavarian, seventeen. The United States Regular Army has therefore been distinguished for many years by a markedly higher venereal rate than that of any other army—a rate four to six times as high as that of the most efficient troops of Europe and Asia.

How shall this be decreased? To elicit discussion I offer certain suggestions, comprising educational, punitive, and prophylactic measures.

Educational.—Our army should learn the lesson so well taught by Japan and by Germany, namely, that in all matters concerning the health of troops the medical officers should have supreme control. It is perhaps to our credit that we are mere amateurs in the art of war; but it is less creditable that we are so slow to learn from experts. The medical officers of our regular army have always been regarded as poor relations, mere ministers to the sick and wounded; their equally valuable function—that of preventing preventable disease—is not exercised as it is in efficient military systems. The medical department is not represented on the general staff. The soldier should be carefully instructed concerning the disasters, immediate and remote, wrought by venereal disease—this is already included in the army programme.

He should be informed that the comfortable doctrine current among men, which asserts that sexual indulgence is necessary for bodily health, is merely a flimsy pretext for self-indulgence. It is common knowledge that during eighteen months' warfare with the Russians, 1904-5, the Japanese troops maintained a standard of health never before equaled by any large army, Japanese or other; yet no prostitutes were allowed to mingle with them.

The fruit of such educational seed depends, of course, upon the intelligence into which it is sown. Among over 3,000 male students of a certain state university the venereal rate was reduced through such education to one tenth its former figures. Such happy effect from mere instruction cannot be expected in those whose heredity and environment have been less fortunate; but all our soldiers should certainly have the information, however much or little profit they may derive from it.

Punitive.—It is notorious that in our army venereal disease causes more disability for military duty than any other disease. If the present rate be maintained throughout the year, over 150,000 men will be exempted from active duty for variable periods because of such disease. While the most serious disasters will redound to self, family and nation after their return to civil life, yet the immediate impairment of military efficiency is too serious a matter to be ignored. It is suggested that we follow the efficient German practice of making the acquisition of venereal disease a cause for punishment. The Government need not forbid illicit sex relations; it may continue to minimize temptation and to use the prophylactic treatment; but if venereal disease result from the soldier's voluntary act, the childish plea, "Didn't know it was loaded," will no longer avert punishment.

Prophylactic.—The excessive venereal rate seems due in large measure to the tardy use of the prophylactic treatment. This measure appears to confer virtually complete immunity if properly used within an hour after exposure; it has often failed when used four or more hours thereafter. Under present regulations it is not used until the soldier returns to camp, an indefinite number of hours after exposure, depending largely upon the length of his leave. Since he cannot be brought to treatment within an hour, it is obvious that the treatment should go with him—that he should be supplied with the protecting remedies and taught to use them immediately after exposure. This was, indeed, the method adopted when the prophylactic treatment was introduced into our army in 1909—in a half hearted, clandestine way, through confidential instructions to medical officers, because the authorities feared the imputation that they were encouraging immorality. It is not surprising that a measure introduced in this timid way, by medical officers devoid of authority to enforce it, should have been ignored by the ignorant soldier, and that it should have been supplanted by the present inefficient method.

It is suggested that either a complete kit—soap, protargol solution and calomel ointment—or at least soap, which alone destroys the spirochete of syphilis (Reasoner), be furnished each soldier; that he be taught how to use them properly; that he be ordered under penalty to use them immediately after exposure; and to report for the official treatment upon return from leave. If the soap be scented with some freakish perfume and the calomel ointment colored with an aniline dye, his neglect to use either would probably be detected when he reports at camp for the official treatment, in which event he is penalized. If he fails to report exposure and develops venereal disease he is penalized under present regulations.

It is rumored that the present inefficient use of the prophylactic treatment results from the pressure exerted upon our military authorities by certain worthy people who oppose individual prophylaxis on the ground that it will encourage immorality.

*Read before the Chicago Institute of Medicine, April 26, 1918.

Some thought it better that a million children should die of diphtheria than that a thousand guineapigs should be sacrificed to save those children's lives; and some people still argue that the hideous mortality of our troops from typhoid fever in 1898 is preferable to the use of antityphoid inoculation. Even the inefficient prophylactic method now in use has cut the army venereal rate from 150 to ninety—that is, for an army of 2,000,000 men, from 300,000 to 180,000 cases of venereal disease each year; by adopting the measures used abroad the number should be reduced below 60,000. It is possible that the addition of individual prophylaxis to present measures may increase the number of exposures; it is certain that it would decrease the number of infections.

To summarize: The excessive venereal rate in our Regular Army, averaging four to six times that of efficiently managed armies abroad, seems to be due in part to three oversights: To the medieval practice of regarding medical officers as mere ministers to the sick and wounded, ignoring their value in preventing preventable diseases, including venereal infection, when given the authority so to do; to delay in the use of the prophylactic treatment, because individual prophylaxis by the soldier himself is not used; to failure to proclaim the acquisition of venereal disease through a voluntary act as a punishable offense against the service.

That our Government's firm and intelligent handling of the liquor question in the army will confer extreme benefit upon army and nation, is obvious; it is to be hoped that this unique opportunity to confer even greater benefit through equally firm and intelligent handling of the venereal problem, will not be lost.

32 NORTH STATE STREET.

MALARIAL FEVER.

Its Dangers to Northern Soldiers in Southern Camps.

By F. RICHARD NEWMAN, M. D.,
Wheeling, W. Va.

Of all the infectious diseases to which our soldiers are exposed, malarial fever certainly deserves first rank. The northern soldier, unaccustomed to southern life, is an easy victim unless extraordinary precautions are taken, and special instructions regarding its dangers impressed upon him. No matter how sanitary our camps may be, unless rigid prophylactic measures concerning each individual are carefully observed there certainly will be epidemics. Now that spring has arrived the mosquito is bound to arise from his latency and become prolific. Army surgeons who never practised in the southlands and are not familiar with this disease from a clinical standpoint will experience some trouble in reaching a positive diagnosis.

I cannot agree with certain authors who say that the diagnosis of malarial fever is very easy. For several years I was a practitioner in the State of Tennessee and came in contact with and treated hundreds of cases in Tennessee, Arkansas, and Mississippi. I have found it almost impossible to separate some cases from other diseases. One type

which should receive special and careful study is the estivo, *i. e.*, autumnal fever. The symptoms are so irregular and the general appearance so strongly suggestive of typhoid, that the terms bilious remittent and typhomalarial fever have been applied. It is impossible to make a positive diagnosis without a blood examination. The two most important varieties of mosquitos prevalent in the southlands are the culex and anopheles. The culex is essentially a city insect and shows no markings of the wings beyond the ordinary veins, while the anopheles shows distinct markings, the wings being mottled, and it is found chiefly in country districts; the genus anopheles seems to be the most virulent, due perhaps to its nocturnal remissions and is responsible for the transmission of the plasmodium malarie to mankind. Earnest warfare against these insects should be rigidly enforced, no matter to which family it belongs. Instructions should be furnished each soldier upon the habits and life history of the insect and its relation to disease. Every case of malaria should be regarded as a centre of infection and promptly isolated.

U. S. ARMY SURGEON.

Pathogenesis of War Concussion Phenomena.

Medical Proceedings, January 17, 1918 (continued). To account pathogenetically for the severe concussion-al manifestations met with among soldiers as a result of nearby explosions of large calibre shells. These subjects, apparently uninjured, nevertheless exhibit loss of memory, equilibration, vision, hearing, or speech. Several or all of these disturbances may be present in a single case. The symptoms disappear gradually in the course of six to eight weeks or may persist for years, or if untreated become permanently established. While the rate of propagation of sound waves in the air is 333 metres per second, the rate in the case of the "shock waves" in the vicinity of an exploding shell may be 2,000 metres per second. With increasing distance from the point of explosion this rate quickly diminishes, and at sixty metres it is no greater than that of ordinary sound waves. Within the sixty metre danger zone, however, an increase of pressure occurs which may attain 200 kilograms per square centimetre of surface. Such compression fortunately lasts but one to two hundredths of a second. In the danger zone, furthermore, the increase in pressure is not uniformly progressive; between actively injurious zones are "dead" sectors. Even in the zones of increased pressure, in fact, there are areas of different pressure intensity. Hence the observation that soldiers standing together may exhibit very unequal central injury from a nearby shell explosion. The physiological effect of the intense, brief augmentation in pressure is to force the blood toward the centre of the body and consequently toward the brain, enclosed in a rigid bony covering. This forcible impulse of the blood would always be fatal were it not for the capillaries, the parietal resistance of which acts as a brake. In certain cases of war deafness not only the middle ear but the entire surface of the body is involved. Ear protectors, while very useful in some cases, are not efficacious in the prevention of the latter type of injury.

MEDICAL NOTES FROM THE FRONT.

Crime Among German Children.—The Nephritides of War.
GENEVA, April 10, 1918.

Some months ago I referred briefly in one of my letters, to the marked increase of crime among the Hun youth. The German newspapers continue to reflect an extraordinary increase, and hardly a day passes without news of one or more murders.

Several of the most recent have been perpetrated by children, and Herr von Ewald, the Hessian Minister of Justice, stated in the Diet at Darmstadt the latter part of March, that the effect of the war upon Teutonic morality is causing the greatest anxiety, and that the increase of criminality among the young is terrifying. He then offered the following statistics of sentences passed in Hesse upon criminals under the age of nineteen years, viz: 285 in 1915, 347 in 1916, and 468 in 1917. The total number of convictions of children for minor offences was: 585 in 1914, 1,145 in 1915, 2,895 in 1916, and 4,012 in 1917.

* * * * *

I will now give a rather full account of the work done in both Germany and Austria on the nephritides of war (Kriegsnephritis), first referring to the early symptoms. Neisser, Albu, Schlesinger, and others insist upon disturbances of micturition, dyspnea, headache, and backache, Vollhart is particularly in pointing out the peculiar frequency of the two latter symptoms, while Schuller has noted tibial pain. Preminger, who appears to have had a very considerable experience in renal affections from the fact that he directs the wards of the Reserve Hospital at Marienbad devoted to these lesions, has recently confirmed the above statements in general.

Jungmann maintains that the nephritides of war usually begin with chills and a rise in temperature during the evolution of the morbid processes, and, from what he has observed, it appears that the renal manifestations develop during this febrile phase. He inclines to the opinion that the fever indicates the infectious nature of the renal lesions.

On the other hand, Preminger states that a rise in temperature was rarely noted in his cases and further remarks that in chronic nephritis a rise in temperature is not infrequently due to an intercurrent furunculosis, rheumatism, or an inflammatory process arising in the dental periosteum. He, therefore, believes that such lesions may occur during transportation to the base hospitals from the front or may arise from the impossibility of properly treating these cases at the front, and considers the fever is a proof of the infectious nature of the renal lesions.

The Huns have noted that edema is likewise an early symptom of war nephritis, and recently Weiss has pointed out that chilling of the cutaneous surface plays an important part in the pathogenesis of the edema, a statement based on his researches on the capillaries under the fingernails, and he applies this theory to the action of cold in the production of the renal processes, since there evidently must be some similarity between the renal capillaries and those of the skin. At least such is his supposition.

Hirsch likewise believes that cold, by exercising

an influence on the cutaneous capillaries, results in edema, and that cold alone is sufficient to produce nephritis without the action of an infectious agent. Now, while Nonnenbruch, Jungmann, Aschhow, Meyer, Löhlein, Knack and Hierzheimer opine for the infectious nature of these renal processes, Hirsch, Wagner, Posner, Mathes, and others maintain that these nephritides are particularly the result of cold. Preminger finds that in his hospital service at the rear, eighty per cent. of his cases are due to cold, while observations made at the front by Ziemann and Nevermann have shown that cold was the etiological factor in their cases.

I would here point out that the researches of Beitzke and Seitz on the blood and urine *in vivo*, as well as their histological studies of the renal gland removed at autopsy, have not proven the infectious nature of these nephritides. From what has been said, it may perhaps be assumed that the lesions of the cutaneous capillaries in edema may result without any infectious process being in play. During 1917, Preminger noted the occurrence of pulmonary tuberculosis, coinciding with these nephritides, a fact that I have not seen mentioned by any other writer. According to Nevermann, there is frequently a rightsided bronchitis during the acute phase of these renal processes, while Preminger has found that pleural transudates more particularly occur in the right thoracic cavity and that when bilateral, and of equal volume, it occasionally happens that the fluid first disappears on one side, to be followed by absorption of the collection on the other side, these data having been demonstrated by radiography.

In only a few cases was Preminger able to detect any abnormal cardiac sound, although radiography revealed a dilatation of the heart in the majority of his patients. The same writer states that he has very frequently noted an acceleration in the succession of the second bruit following on the first, at the apex, but was unable to discover this phenomenon in any way related to the nephritis. When first examined the patients frequently offered an accentuation of the second aortic sound and these cases had a very high blood pressure. The cardiac symptoms were only exceptionally the result of valvular lesions, being usually due to a more or less marked stasis in the vessels.

According to Schütz and Horniker, the ocular manifestations are due to stasis in the circulatory apparatus and Pflanz has found that even when there was a very low blood pressure, both albumin and casts were absent from the urine. There is, therefore, no doubt but that the circulatory system is the seat of certain pathological changes in the nephritides of war.

Opinion varies greatly in Germany and Austria as to the pathogenesis of these circulatory disturbances, the high blood pressure and cardiac dilatation in the nephritides of war, but, from all I can learn, the mechanical theory is far more popular than the chemical. Ceelen, from numerous autopsies, maintains that the toxins circulating in the blood, irritate the ganglia of the vasomotor centres of the medulla oblongata, the result being a high blood pressure.

I now refer more especially to Preminger's studies because he appears to me to have done more on the question of nephritis than any other Hun, and presents some really good work. One has only to glance over the medical press of Germany since the commencement of the war, in order to become convinced of the absolute inferiority in the quality of the contributions, when compared with the writings of the French, English, and Italian observers.

Each patient was submitted to a radiographic examination of the cardiac area and, if any pathologic condition was discovered, he was placed under strict observation, so that any ulterior change could be noted. Out of a total of 121 cases, the majority presented a relative dilatation of the heart. This enlargement was usually partial and involved the left, more than the right heart. Rarely were both the right and left heart involved simultaneously in the early acute period of the nephritis.

I would here point out that Dietlen has usually found a total cardiac dilatation in most infectious diseases, but in Preminger's radiographic examinations the opposite findings would seem to point to a noninfectious etiology of the nephritis if Dietlen's results are to be accepted as correct. And still more, Preminger's control experiments showed that the dilatation of the heart and aorta during the acute and subacute stage of the nephritis was quite susceptible of regression.

On the other hand he was rarely able to note a decrease in the size of the cardiac and aortic shadow in those cases where the history, evolution, and condition of the heart led him to assume that the renal process was a recurrence of a previously existing process. These patients showed a smaller cardiac shadow after absorption of the pleural transudate, but this decrease was only apparent and was due to the lowering of the apex and to the remoteness of the aorta from the body surface.

Preminger seems to me to have very properly taken into consideration the shadow of the spine when interpreting that of the heart, and he points out that by percussion a dilatation of the right or left heart may be elicited, while a radiographic examination shows that the increase is apparent only, the heart being simply pushed aside *en masse* to one side or the other. Therefore, the appreciation of this fact will lead one to use the spine as a landmark in making one's appreciation of the cardiac changes.

In six per cent. of Preminger's cases there was a catarrhal lesion of the bladder and very frequently blood was present in the urine. Goldberg, Albu, and Schlesinger have each maintained that the microscopic presence of red blood corpuscles in the urine is the last symptom of a nephritis undergoing regression. I think Lichtwitz is not far from right when he says that blood, casts, and albumin are present for some time after the renal functions have become restored. CHARLES GRANT CUMSTON

Not a Bible This Time.—Recently, in Bordeaux, while Major Dausse was bending over a sick Austrian prisoner, the latter stabbed him in the neck with a concealed knife. Fortunately the doctor's celluloid collar mitigated the blow, though the wound was severe.

MEDICAL NEWS FROM WASHINGTON.

The Mayo Brothers Require Definitions.—The Surgeon-General Should Be on the General Staff.—Order of Getting at the Facts About Pneumonia.—Strength of the Naval Medical Corps.—Soldiers Who Are Ill on

WASHINGTON, D. C., June 8, 1918.

William J. and Charles H. Mayo, the celebrated surgeons of Rochester, Minn., who are majors in the Medical Reserve Corps, have been detailed for duty with the general staff of the army, in addition to Colonel L. P. Williamson, of the Medical Corps of the regular army, who has been serving on the general staff for some time.

However, the Mayo brothers have requested the War Department to rescind these orders. Under an arrangement made with these officers, one is to perform duty at Washington, while the other is at the Mayo institution at Rochester, so that, so far, all orders have been so framed as to apply to one or the other, whosoever it may be to have the tour of duty at Washington, and at present Major Charles H. Mayo is at Rochester as instructor in the course of military surgery at the Mayo Clinic.

After the detail to general staff duty, one of the Mayos reported at the headquarters of the general staff to acquire information as to what was desired of him, and he learned that the duties would be somewhat perfunctory and would not require his presence with the general staff except on occasion when advice was needed. Major Mayo learned that he was not to be provided with desk room in the general staff section, and the result of the conference was that he indicated that he was unwilling, under the circumstances, to serve on the general staff, speaking for himself and his brother.

There has been a sentiment in the Medical Corps that the Surgeon General of the Army should be an ex-officio member of the general staff, or at least that the Medical Department should be represented by high ranking medical officers, familiar with the requirements of the medical service of the army, and in a position to discuss the medical and hospital problems. A bill is pending in Congress that provides that the Surgeon General shall be a member of the general staff, and it is understood that there is no particular objection in the War Department to that part of the measure.

However, there are other provisions in the bill that are likely to encounter departmental opposition, such as one that the Secretary of War "shall take such measures as will fix responsibility for sanitary defects upon the proper commanding officers"; that no cantonment or camp for troops shall be established unless its selection has been duly considered and formally reported upon by the Medical Department; and that the commissioned personnel of the Medical Department on active duty "shall be distributed in the same grades in the same ratios as heretofore established by law in the Medical Corps of the United States Navy."

Some important recommendations have been made by the Surgeon General of the Army for promotion of the regular and reserve

branches of the Medical Department, including medical officers on duty in France.

Colonel Theodore C. Lyster, Medical Corps, National Army (lieutenant colonel, regular Medical Corps), has been appointed a brigadier general in the National Army. Since his return from France he has been on duty in the Surgeon General's Office in charge of the section in head surgery.

Orders have been prepared for the examination for promotion to captain of first lieutenants of the regular Medical Corps that have, or will have, in the near future, completed a year's service. This list to be examined includes those that will have finished a year's service on November 9.

A large number of officers of the Medical Department, both regular and reserve, were in attendance this week at the meeting of the American Medical Association at Chicago, including Major General William C. Gorgas, Surgeon General, and Brigadier General Robert E. Noble, Medical Corps, National Army.

* * * * *

Reports received by the Surgeon General of the Navy from medical officers and civil communities show that pneumonia causes as many deaths as tuberculosis, if not more. Like tuberculosis, pneumonia is a common complaint taken as a matter of course, and it does not excite fear in the laity as would the outbreak of an unfamiliar disease like bubonic plague, which even though introduced into the United States would never become as widespread and be responsible for so many deaths.

During the past winter, the navy suffered considerably from pneumonia. Its medical officers have had a splendid opportunity to gather information that might lend itself to a solution of the problem. For this reason, the bureau of medicine and surgery is about to furnish the medical officers with a questionnaire upon which to note observations, which when studied in the aggregate may be of great value. The bureau desires as much as possible in every case, but it understands that exigencies may arise that would prevent a medical officer from filling in the blanks in whole or in part. However, it is hoped that the medical officers will cooperate, so that the bureau may have as much information as possible from which to draw conclusions from the standpoint of predisposing influences and the prevention of the disease among the naval personnel.

* * * * *

On June 1st there were in the naval Medical Corps 2,428 commissioned officers, including those of the reserve branch, to which additions are being made at the rate of about fifty a month, and the needs of the service being eighty in that period. There was an unusual increase in the Reserve Corps during May by 250 on account of the available graduated students from colleges. With increases in the personnel of the navy and marine corps it will be necessary to add constantly to the number of reservists, and appointments are being made each week as candidates are pronounced qualified for the service.

* * * * *

An amendment to the pending army appropriation bill, of interest to the medical profession, relating to employment of physicians by the army, was

stricken out on a point of order in the House, but doubtlessly it will be offered in the Senate. It was as follows: "The Secretary of War may, under rules and regulations to be prescribed by him, provide for the employment of civilian medical service, including care and subsistence in private hospitals, for officers, enlisted men, and civilian employees of the army, on leave of absence or furlough, or otherwise absent with leave from the status of duty: Provided, That it shall be impossible or impracticable for the Medical Department to furnish the necessary medical treatment and hospital care, and that the disabilities necessitating such service shall have originated in the line of duty."

It was explained that the amendment was simply to permit the payment by the Government of the cost of treating a soldier on furlough when he is in a private hospital as a result of illness or injury received while on duty, and that it had the sanction and express approval of the War Department and of the Surgeon General.

There have been many cases where extreme hardship has resulted from the present law, which does not permit such payments. For example, a soldier is taken ill in camp. He is not seriously ill at the moment. He applies to his company commander for a furlough, and he goes home. It then develops that he has contracted pneumonia or some other serious illness. He has to go to a private hospital and incur charges for his medical and hospital care. Under the law, although that illness was incurred in the service and in line of duty, there is no way by which he or his family can be reimbursed for the expenditures that have been necessitated by his military service.

LIBERTY FIELD HOSPITAL WARD.

There was an old army doctor in the Civil War who became so tired of the petty tyranny exercised concerning army hospitals, that he headed his last batch of requested drawings "Blockhouses for blockheads." There may be some hidden feeling of the same sort around in our hospitals, but, judging from the fine Liberty Field Hospital Ward of unit construction, portable, and convertible into dwellings, designed by President Henry Fairfield Osborn, and Superintendent of Construction Harry F. Beers, for the American Museum of Natural History, there seems to have been no grudging of money or interest in providing for the sick soldiers today. Listen further to its charms. It is adapted to army, hospital, Red Cross, and Y. M. C. A. types. It is for use under any climatic conditions as a winter and summer hospital or sanatorium, and can even, as regards portability, "fold its (blocks) like the Arabs, and as silently steal away." Best of all, it is convertible. When growing War has become a toothless giant, the wards can be taken apart and converted into dwelling houses of any size, to be used in the reconstruction of devastated villages.

The dominant idea is to get all the air and sunshine possible, with abundant ventilation and careful provision against extremes of heat and cold. The total weight of the completed ward, 150 feet in length, is 114,425 pounds, and can easily be transported by the new United States Liberty trucks.

Editorial Notes and Comments

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and the Medical News

A Weekly Review of Medicine

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THE CHICAGO MEETING.

War has made greater demands on the medical profession than on any other calling. It is estimated that there are in the United States 76,000 physicians between ages of twenty-one and fifty-five years, the limits set for military service. Of these, there are now in the army and navy approximately 21,000, or more than twenty-seven per cent. Beside these, 15,000 physicians are actively engaged in war service as members of local and district draft boards and about 9,500 are serving on the medical advisory boards. It will be seen from this that war has affected the work of the practitioners of medicine to an extent little realized by the general public. As one result, the Chicago meeting of the American Medical Association, a report of which begins in this issue, was largely a war meeting. Not only were the medical departments of commerce and navy well represented, but delegates were present from the armies of France, Belgium, England, Canada, New Zealand, and Australia. Special meetings were held on Thursday and on Friday to discuss the medical aspects of the selective service. Even the conference of medical schools held at the same time was

principally concerned with the effects of war on the schools and with the consideration of medical military instruction. The admirable address of the president, Dr. Arthur Dean Bevan, which is published in full in this issue, is devoted to the organization of the medical profession for war. Entirely aside from the military matters discussed, many valuable papers were read and the abstracts which we present in this issue and will publish in following issues will prove of interest and value to our readers.

The election of Major Alexander Lambert as president comes as a well deserved honor to one of the most famous practitioners of medicine in New York. Major Lambert returned from France recently where he was medical director of the Red Cross in that country.

THE MEDICAL WEEK IN HAMILTON, ONTARIO.

Tuberculosis, pneumonia in military camps, heart murmurs especially affecting the recruit, public health particularly terminal disinfection, cancer, goitre of various forms, venereal diseases, and a vast host of minor medical matters were discussed, considered, listened to, even resolved upon at the unprecedentedly successful meeting, or, to be more dignified, congress, of Canadian medical men which came to a close in Hamilton on June 1st. More than 1,000 medical men are said to have registered, and they came as members of the following associations: Canadian Medical Association, Ontario Medical Association, Health Officers' Association of Ontario, Canadian Public Health Association, Canadian Association for the Prevention of Tuberculosis, and Canadian Medical Protective Association.

Hamilton never had so many doctors in its midst; but there has been no increase of sickness, though the food supply diminished materially. Dr. Charles H. Mayo conducted, on the first of June, a surgical and medical clinic which will pass into the annals of Hamilton as historic. The clinic was on goitre, and Major Mayo had also delivered the address in surgery on cancer. Thus were two enticing surgical topics dealt with by a master hand. Of goitre Major Mayo stated that it did not often become malignant and that although Switzerland had often been considered to be the home of goitre, America could go that country one better, as there were more cases, that is, a higher proportion, in America than in Switzerland. America, perhaps, could not be considered to be particularly suscepti-

ble. (Continued on page 10.)

smokers acquire cancer of the lower lip. There are a great many smokers, and by all accounts the numbers are increasing, in the cigarette line—but that may not be so dangerous—and some who do not smoke get cancer of the lower lip. Perhaps, we are yet no nearer the cause of cancer of any region. Of the incipient lesions the surgeon will still advocate the total extirpation, cutting as wide as possible, although the evidence is piling up gradually that radium is going to be the best treatment for pre-cancerous conditions; and then we shall have to wait to see just how long a period intervenes before any recurrence, or whether there is no recurrence.

A very wise resolution was adopted by the surgeons, namely, that the Government should be approached to take steps to control the issue of licenses to surgeons. They should be required to take three extra years of study, either with a qualified surgeon—who will decide upon a qualified surgeon?—or in a general hospital. Medical men, that is, physicians, have long thought that too much surgery was being done; therefore, it is interesting to see the surgeons getting wise to the game. There is no doubt that very few of us delight in the poking around in our "innards" of the tyro hand.

The significance of heart murmurs found in examination of candidates for military service engaged the attention of Dr. Lewellys F. Barker, in the address in surgery. Doctor Barker took the view that men with organic disease of the heart valve need not be unconditionally rejected, as some recruits, despite organic murmurs, could withstand conventional exercise better than others who had no evident murmur at all.

There are some public health men in Canada who have advanced views on terminal disinfection. The subject is of sufficient importance to be settled definitely, as, working under different provincial laws, there should be at least uniformity in each province as regards its own public health act. If Ottawa, let us suppose, does not disinfect, then why should Kingston disinfect? If contact is necessary for communication, the public must be better educated, and the air borne fetich should be laid. There is still a belief abroad that it is dangerous to come into contact even with a third person.

Although apparently Canada is fast drifting into preventive medicine, two of the most dreaded diseases are but feebly tackled, namely, pneumonia and cancer. They have been fighting tuberculosis for a score of years or more, and governments have not even yet recognized their full responsibilities. An effort is now to be made in preventing insanity. The venereal diseases, aggravated by war conditions, are ambitious to lead the way. There is child welfare, the rehabilitation of the returned soldier,

town planning, etc., and a "through other" policy, everybody taking a bite here and there.

With the statement of the president of the Canadian Public Health Association, Captain W. H. Hattie, of Halifax, all must be in unanimous accord: the health of the community is a matter of great importance. Every effort should be made to keep the nation strong physically. If so, why employ sniping and machine guns? Much better employ intelligence, cooperation, organization—a minister of public health for the Dominion—a minister of public health for each province!

DOG IN THE MANGER.

We begin elsewhere in this issue a brief outline of the proceedings of the sixty-ninth annual meeting of the American Medical Association, which was held during the past week at Chicago. Through the courtesy of many members of the medical profession, we are able to supplement the work of our reporters and to offer authors' abstracts of a number of the scientific papers read at the annual meeting. Some of the authors who were asked to send us abstracts of their papers seem to have been prevented from doing this by the attitude taken by the editor of *The Journal of the American Medical Association*, which is set forth in the following letter addressed by him to an author whom we had asked to furnish an abstract of his paper:

Replying to your letter of the — inst.: Each year immediately after we publish the preliminary programmes of the sections in *The Journal* some of the medical journals, especially the weeklies, write to those who are listed to present papers, asking them for abstracts. It has not been uncommon for some authors to comply, and to send a rather full abstract; and not infrequently these abstracts are better than the complete article, since practically all of the nonessentials are omitted, and only the "meat" presented. In such cases the publication of the complete paper in *The Journal* is precluded.

Yours very truly,

EDITOR JOURNAL AMERICAN MEDICAL ASSOCIATION.

Fortunately for our readers and, we think, for the cause of medicine, some authors have not been intimidated by this attitude and have welcomed the opportunity to give their observations and views such additional publicity as could be gained by the prompt publication of abstracts in the *NEW YORK MEDICAL JOURNAL*. The authors prepare these papers with a view to aiding in the developing of medicine, thus furthering the avowed object of the American Medical Association, as set forth in Article 2 of the Constitution of the Association in the following words:

The object of this Association shall be to promote the science and art of medicine . . . for the purpose of fostering the growth and diffusion of medical knowledge

. . . and of representing to the world the practical accomplishment of scientific medicine.

The editor of *The Journal of the American Medical Association* takes a stand in direct contravention of this principle. He tells the authors, or at least some, for we doubt if he has written similar letters to all the authors, that their papers will not be printed in their official organ if they furnish abstracts to other journals. In other words, he must have a monopoly of all the scientific information presented before the Association. We can well understand that he should be given the prior claim on the complete papers. But it seems hardly credible that the publication of an abstract in another journal should, of itself, preclude the subsequent publication of the complete paper in the organ of the Association. Indeed it would be most unfortunate if the editor should be permitted to carry out this threat. Medicine is opposed to monopoly of all kinds. No medical man of good standing endeavors to keep secret for his own gain any process, method, or invention which might be useful in the prevention, mitigation, or cure of disease. The individual physicians constituting the membership of the organization are committed to a policy of publicity for, and of unrestricted use of their discoveries and inventions. Surely they will not permit their organ to institute a policy of secrecy and monopoly regarding the scientific proceedings of the organization.

We cannot believe that the members, as a whole, will approve of this effort on the part of the editor of the organ of the Association to prevent the publication of abstracts of papers presented by the members before the open scientific meetings of the Association. We are confident that they will repudiate this narrow stand.

ACIDOSIS IN ANESTHESIA.

The greater tendency of patients suffering with malnutrition or starvation, as a result of disease or long continued vomiting, to surgical shock, uncontrollable vomiting, and particularly acidosis, has been the subject of a good deal of study with the view of obviating these tendencies and reducing the general surgical risk. The acidity of the organism is usually increased in starvation, and this acidity becomes often very serious when anesthesia must be induced. Many of the surgical operations are accompanied by acid intoxications, but usually they are so mild as to give no trouble or even to betray their presence. The excretion of acetone bodies in the urine or in the breath, whether in metabolic disease, in obstetric conditions, in infancy, or after operations, always have the same significance—an overproduction of

triturable acid and a lack of available alkalis in the body. It seems that in starvation or in anesthesia where rapid protein catabolism is induced, followed by acid conditions, the carbohydrates prevent this rapid disintegration and consequent acidosis. The same condition is true of diabetes where the carbohydrates must be restored to prevent acidosis and coma. In these postoperative intoxications the administration of carbohydrates has met with good results. A glucose solution is given because it is more readily absorbed and because it does not remain in the intestines to ferment and cause digestive disturbances. It is the absorption of the carbohydrates and their oxidation which prevents protein and fat destruction. Where the carbohydrate cannot be given by mouth it is supplied intravenously, hypodermically, or per rectum. The use of the glucose solution not only prevents acidosis but supplies the place of food, gives energy, and helps in the repair of the tissues. Even the massive administration of glucose solution intravenously, for example, does not cause more than a small percentage to appear in the urine. Most of it is oxidized in the body. In patients where there is reason to anticipate postoperative acidosis the glucose solution can be given before and after operation. In twenty-four hours as much as 200 grams of glucose may be given in the form of three litres of an isotonic solution, about five per cent. by hypodermoclysis. In severe cases, also, where the contingent effect of the anesthetic is feared on protein catabolism, the glucose solution is administered by hypodermoclysis during operation. A half a litre of the isotonic solution may be given.

The administration of the glucose solution and soda not only prevents acidosis but lessens thirst, nausea, and vomiting. It is a form of therapeutics which seems to have come to stay.

THE PATHOGENESIS OF TACHYCARDIA DURING CONVALESCENCE FROM TYPHOID FEVER.

Unquestionably, the temperature in general has a manifest action on the circulatory system, and the frequency of the pulse is subordinated to the increase of the body heat. This is the rule, but not an absolute one, because a normal temperature may coexist with a marked tachycardia.

In the first place, a tachycardia during convalescence from typhoid fever may result from anemia due to the specific bacillus of the infection, and, in proof of this, let it be noted that when the disease is mild and of short duration, therefore little anemia being present, acceleration of the

pulse does not occur. So the duration of convalescence is in direct proportional relationship to the gravity and duration of the evolution of the typhoid.

During the first few days of convalescence the pulse usually offers a tendency to a return to the normal, made evident by a decrease in the height of the dirotic wave and by its equalization of the predicrotic and postdicrotic abrupt dips when these exist. In other words, the arterial tonicity, which was low during the height of the disease, insensibly increases during the latter days of decline of the typhoid to reach its maximum on the day of complete defervescence of the pulse. The anemic convalescent is in exactly the same situation as a person who has been bled.

The signs indicating a lowered blood pressure are a dirotism of the pulse, decrease of the aortic valve sounds, and an increase of the cardiac beats, and, as concomitant symptoms, cutaneous circulatory disturbances. However, it is to be noted that along with an increased pulse rate there may be a notable increase in arterial tension during convalescence from typhoid, although no renal or other lesion can be detected. The reason for this phenomenon is obscure.

Another cause of tachycardia during convalescence from typhoid is myocarditis, and, according to its intensity, the tachycardia will continue for a variable length of time. The nutritive and functional activity of the myocardium, the richness of its arterial irrigation, and its intimate relationship with the endocardium and pericardium exposes it more than any other viscus to the direct or secondary action of the specific bacillus circulating in the blood. It thus becomes the seat of acute or chronic inflammatory processes which contribute to weaken it. The myocardial lesions manifest themselves clinically by an intermittent pulse, and, although this indicates a very serious prognosis, it does not of necessity imply a fatal outcome.

Other cases offer a regular but rapid pulse with a more or less pronounced tachycardia, and when this continues after a month of convalescence it would seem difficult to attribute to a typhoid poisoning of the cardiac nervous system and should be regarded as due to the pathological changes existing in the myocardium.

On the other hand, a goodly number of autopsies have shown that the myocardium was healthy, although the patient presented a very pronounced tachycardia during life. And still more, certain typhoid patients who offered a manifest tachycardia during the height of the disease which persisted during convalescence,

have shown a perfectly normal myocardium at necropsy. How can this be explained? The generating conditions of typhoid tachycardia, when the myocardium is intact, may very well result from a functional disturbance following upon the action of the typhoid toxins on the cardiac innervation or on the cardiac muscle itself, and it may logically be upheld that there is a direct action of these toxins on the centre of cardiac innervation and that a change in the activity of the intracardiac ganglia is not necessarily in play and, for that matter, it must be conceded that as yet the physiology of these ganglia is not any too clear.

WAR BRED.

There are just now many dismal minded persons who wear war spectacles and never take them off in case they should be convinced that the sky is really blue. At present they are singing a mournful dirge over the cradle of the newly born, or a still more sad one over the fate of the yet to be. They invade the nursery and point with horror to the boys and girls playing at soldiers; at Red Cross nursing; they glower from street corners at the youngsters making frantic dashes from imaginary trenches to slay imaginary Germans. They predict wild, insubordinate workmen bred from families where the father is absent fighting, and the mother making ammunition for him, while the children are left to themselves. Some kindhearted patent medicine firms have even put on the market special drugs and foods for "war shocked children," and schools and churches with leagues and banners and songs, buttons and badges and bonds, try to inculcate so much patriotism that there will be no room for any other emotion.

Now, conceding the pessimist a certain percentage of war injured children, that is, having their nervous system unbalanced by the fear of aeroplanes, scanty food, and lack of discipline, and the general excitement, we would ask him for his comfort to remember the wonderful recuperative power in children. To children who passed through the horrors of war in 1870 and 1901 in besieged town and village under shot and shell and enduring starvation, all these things seemed to become merely a memory. It is not the stupendous events which always take root in our memories. A look, a word, a gesture, some trivial incident or scene may retain its influence for good or evil long after the stormy events, the overpowering sorrow, have passed. Herein, surely, lies comfort for those who would assume old heads on young shoulders, for children are certainly blessed with happy powers of forgetfulness.

THE AMERICAN MEDICAL ASSOCIATION

Sixty-ninth Annual Meeting

Held at Chicago, June 10 to 14, 1918

THE sixty-ninth annual meeting of the American Medical Association was the most notable military affair. The retiring president and many of the section officers and members in attendance are officers in the Medical Department of the army. Representatives of the army medical services of Great Britain, France, Belgium, Canada, New Zealand, and Australia were guests of honor at the meeting. We give below the address of the incoming president, Dr. Arthur Dean Bevan, which is also largely taken up with a discussion of the war in its relation to the physician and the practice of medicine. With so full a program as was presented, there was still room for many valuable papers on nonmilitary medicine, and we publish abstracts of a number of the most important papers read at the scientific sessions and will offer a further installment of these in a later issue. Finally, we give a brief outline of the news features of the meeting, which seems to have been well up to the high standards set by previous meetings of the Association.

THE ORGANIZATION OF THE MEDICAL PROFESSION FOR WAR.

Presidential Address.

BY ARTHUR DEAN BEVAN, M. D.,
Chicago, Ill.

I feel greatly honored by the election to the position of president of the American Medical Association. I recognize not only the honor but also the responsibility of assuming the leadership of the organized medical profession of the country at this time. The war has made unusual and exacting demands on us. The Government and the people are looking to us to furnish in this great emergency not only the necessary number of medical men for the army and navy, but also the highest degree of medical service and efficiency. This is proving to be a war not simply between well organized armies but between efficiently organized nations. It is now clear that in order to win the war we must organize the entire nation in such a way that every man and every woman must become a useful part of a great and powerful national military machine. No part of such a great national organization is more important than the medical profession, and on this, the opening evening of this great war meeting of American physicians, it is my purpose to address you on the organization of the medical profession for war.

There are in the United States more than 145,000 men and women licensed in the various States to practise medicine. Of these more than 81,000 are members of the American Medical Association, and more than 45,000 are fellows. The American Medical Association is organized along the most democratic and representative lines. No profession in this or in any country is more thoroughly and efficiently organized. The unit of the organization is the county medical society. It is the avowed purpose of the county society to receive into its membership all reputable practitioners who are legally qualified to practise medicine. The county medical society is a democratic organization. It is not, nor is it intended to be, a select and exclusive medical society. Its functions are educational and social. It exists for the purpose of using the united efforts of the physicians of that county for the benefit of the people and for the education of its members. Any county so-

ciety that is not democratic and representative is not fulfilling its proper function. By virtue of membership in the county society the physician becomes a member of his State medical society and of the national society—the American Medical Association.

During the first half century of its existence, the American Medical Association was a rather loosely organized body. It was founded for the special purpose of elevating the standards of medical education and practice. Its ideals were high, and it accomplished a great deal of good. Not, however, until its reorganization in 1901 on broad democratic and representative lines, did it become in fact the organized medical profession of the country. It is broad enough to include in its membership all licensed physicians who honorably practise scientific medicine.

Since reorganization, it has a record of splendid achievement, succeeding in elevating the standards of medical education in this country, which had been uneven and unsatisfactory, to a position where they are as high as those in any other country. It has improved the character of medical instruction until we can now state without fear of contradiction that the medical student can obtain as thorough and complete an education here in America as anywhere in the world.

Moreover, the American Medical Association has accomplished much through its Council on Medical Education in cooperation with the *Journal*. Through these departments it has been of great service in creating a register of licensed practitioners. A register of medical students is now kept so that the association possesses a full record of the medical career of each licensed practitioner and medical student.

With its constituent State medical associations it has succeeded in securing improvements in the medi-

people against ignorant and inefficient practitioners and securing better public health service and through its Council on Pharmacy and Chemistry done outstanding, pioneer work against the unscientific and unnecessary use of drugs and against the prescribing of secret formulas and "quack" medicines. It has done more than any other medical organization to place drug therapy on a sound and scientific basis.

tion has become the largest and most influential medical periodical in the world. It has a circulation of more than 65,000 copies, and in the best sense it is the instrument that keeps the profession in touch with the affairs of the association, with scientific medicine, and through well prepared abstracts with the current medical literature of the world.

It is now more important than ever that these admirable activities of the association should be continued and amplified, and that steps should be taken to meet the new problems that will confront the association after the war. These will undoubtedly include the stimulation of medical research, the development of an adequate American medical literature, the creation of postgraduate medical facilities not only for our own medical men, but also for the medical men from other countries, who will find here in our great democracy a welcome and opportunities in medical instruction and medical research second to none. But these things can and must wait on the one great problem that confronts us now, the winning of the war.

The problem that confronts the country in this war, as far as the development of the medical departments of the United States army, navy and Public Health Service are concerned, can briefly be stated in this way: If we raise an army of 3,000,000 men, ten per cent. of this number will be in the Medical Department; that is 300,000 officers and men, and of these at least 25,000 must be qualified physicians and surgeons. If we raise an army of 5,000,000 men, the Medical Department will contain 500,000 officers and men, and it will be necessary to have between 35,000 and 40,000 qualified medical men. At present there are more than 200,000 men authorized in the Medical Department of the army. Of these, somewhere from 20,000 to 25,000 will be medical officers, and the balance enlisted men and nurses. If we create a navy of 500,000 we shall need 3,500 medical men. If we create a navy of a million, which is probable, we shall need 7,000 medical men. The need of the Public Health Service, although more modest, will be considerable, and must be met. No one can prophesy the extent or duration of the war, but we can say with certainty that it is the purpose of the American people to create and maintain the largest and most efficient navy in the world and to organize and train and equip an army large enough to win the war.

The efficient organization of the medical profession of this country for war is being splendidly accomplished by the cooperation between the medical departments of the army and navy and the organized profession, the American Medical Association. It has been unfortunate that a medical advisory committee which is not in any way representative or democratic, and which has no proper function in the efficient organization of the medical profession for war, should have been called into existence. A small coterie of specialists, of gynecologists and surgeons, no matter how eminent or how successful they may have been as promoters and exploiters of special medical societies, can in no way in this great emergency and in this great democracy represent the medical profession.

At the outbreak of the war, the American Medical Association offered to the United States Government its entire organization and machinery to assist in the enormous expansion that became necessary. Through the officers of the county societies, the State societies, and particularly through the columns of the *Journal*, the needs of the Government were placed before the organized profession of the country, and they responded splendidly to the call. So far 25,000 have gone into the medical departments of the army and navy. No other profession or calling has responded more promptly to the needs of the country than the medical profession. The great bulk of the medical men who have gone into the Government services were members of the American Medical Association.

The demands made on the medical profession by the war are so great that it is evident that in order to secure the necessary number of medical men for the Government, and at the same time prevent hardships in some communities and institutions, it is necessary to organize the entire profession of the country in a systematic way. It therefore became necessary for the American Medical Association, acting with the Surgeon General's Office, to take a census of the available medical men in the United States in each state, in each county, in each medical school, and in each hospital, and to attempt to secure from each one of these different units at least twenty per cent. of the medical men. This plan will enable the Government to secure the necessary number of medical officers for an army of 5,000,000 men or more, and a navy of 1,000,000 without any great hardship to any community or to any institution. It is evident that a plan of this kind is absolutely essential, and it is the purpose of the American Medical Association through its county and State societies and its national organization to create such a systematic classification and secure the adoption of this plan. Such a plan means a voluntary draft of the medical profession by the profession itself. The medical profession will supply the men needed by the Government. No conscription, no compulsion will be required.

The survey has been completed, and was published in the *Journal*, June 1st. It gives the honor roll of the men who have already gone into the service from each county and state society. It gives the number of men under forty-five and under fifty-five years of age in each county and the percentage of men who have volunteered. Up to this date about fifteen per cent. of the total number of men have volunteered. The Surgeon General of the army has called for 5,000 more medical officers, and the Surgeon General of the navy needs about 2,000. It becomes necessary for us to raise the total number of medical officers this year to about 30,000, which means nearly twenty-two per cent. of the medical men of the country. As president of the association, I desire to call the serious consideration of each county medical society to the fact that in order to do its duty it should furnish at least twenty per cent. of its members for military service. This situation should be met fully and promptly by each county medical society. In order to prevent hardships to communities due to lack of medical service, and in

order to prevent the crippling of medical schools and hospitals, no community and no institution, unless it is clearly oversupplied, should be allowed to furnish more than fifty per cent. of its medical men. As far as possible the quota from each county should be filled by men under forty-five years of age. If this is not possible, men up to fifty-five will be taken. As fast as each county fills its quota of twenty per cent.—and this should be done by each county within the next few months—the secretary of the county medical society should notify the secretary of the State medical association and the secretary of the American Medical Association of that fact.

Profiting by the experience of the great nations that entered the war in 1914, the medical profession of the country and the government have very wisely taken steps to prevent the disruption of our medical schools, and I am glad to say that our national government adopted the suggestion made by the Surgeon General to allow medical students to be commissioned in the enlisted Medical Reserve Corps and have them detailed to complete their medical education and to serve a year in a hospital as interns before they are called into active service. This was to apply to the men who have already studied medicine in the medical school proper for one year. In order to insure the further supply of medical students to meet the demands of a great and prolonged war, the effort is being made to have this apply also to the men who are taking their premedical work in universities. It is necessary to have these men continue their medical studies in order to insure the continued supply and the necessary number of medical men.

The United States is the only great reservoir of medical men in the world. The medical professions of Great Britain and France, of Italy and Belgium, and this is probably more true of enemy countries, have been well nigh exhausted by this war. They delayed making plans for a continued supply, their medical schools became disrupted, and they are already suffering for medical men in their armies and in their civil life. Major Horace B. Arnold, chairman of the Council on Medical Education, who is on active duty in the Surgeon General's Office looking after the problem on medical education for General Gorgas, has this matter now under consideration, and it is to be hoped that he will succeed in securing rulings that will enable our premedical students to continue their medical courses. If the need for medical men becomes very great we can adopt a continuous session and graduate men in three years. The senior students in the medical

schools should have special courses in military surgery. I would recommend that, if possible, one or two competent medical officers be assigned to each medical school for this purpose.

The enormous problem that was presented to the Surgeon General's Office by the war may be realized in a striking way by the statement that the development of an adequate medical department for 3,000,000 men means that less than two per cent. of such a department is represented by the men in the service at the time of the outbreak of the war—that more than ninety-eight per cent. of the men must be taken from civil life, and must be given the necessary military training to fit them for active duty in the field. This enormous problem is being adequately and splendidly met. A small medical department which existed before the war has formed the leaven necessary to change a great body of physicians coming from civil life into efficient military

surgeon and efficient hospital ambulance units. Special training camps for medical men were formed at Fort Riley, Fort Benjamin Harrison, and Fort Oglethorpe. Gradually the work done by these different camps is being concentrated at Fort Oglethorpe, where an enormous military medical university of 40,000 officers and men is being created. Here the enlisted men will receive their necessary training in small and large units, and the medical officers will receive their necessary military instruction and instruction in such medical work as will peculiarly fit them for their military duties.

Standing out prominently in the development of the great Medical Department of the army is a great figure, the figure of Surgeon General Gorgas, who in a very quiet way has demonstrated again

the fact that he is one of the greatest organizers in sanitation and in military medicine and surgery. It is most fortunate that in this emergency work of the Medical Department it was found in such strong and capable hands. General Gorgas is one of the great assets of this country today. The splendid work that he is doing he should continue to do throughout the war and the organized profession of this country could do no greater service to the Government than to make clear to the Washington authorities that they are unanimous in their support of Surgeon General Gorgas, and regard him as the best man in the country for the head of the Medical Department of the army.

General Gorgas has succeeded in surrounding himself with the strongest, most efficient men, and has shown great wisdom and judgment in placing



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departments under his control. The men he has chosen from the regular corps as the heads of divisions are strong and efficient: it is only necessary to mention such men as Welch, Vaughan, Billings, Mayo, De Schweinitz, and scores of others, who in civil life are the recognized leaders in their special field of work, recognized not only in this country but throughout the world. We are equally fortunate in finding the Medical Department of the navy in the efficient hands of Admiral Braisted, who has succeeded in meeting the great expansion made necessary by the war in the most satisfactory way. The medical profession is also proud of the splendid service that has been rendered by the Public Health Service under the able leadership of Surgeon General Blue.

The mobilization of this country for war is an enormous task. To create an army of from 3,000,000 to 5,000,000 men or more, where before we had less than 100,000, and create a navy of from 500,000 to 1,000,000 is an undertaking that had never before been worked out by any country. It was necessary that this enormous mobilization should be done as rapidly as possible, and from the rapidity and the enormous size of the mobilization it was inevitable that the medical organization could not accomplish the impossible and secure at once ideal results. Yet when we compare the mobilization of the United States for war with other countries we find cause for congratulation. Up to the time of our mobilization the army of Japan had held the record for the lowest mortality of any country during mobilization, and the best care of its soldiers from a medical standpoint. In the Japanese mobilization there was a mortality of twenty per thousand. In our mobilization there has been a little less than ten per thousand. In other words, the showing of our mobilization from the standpoint of mortality was twice as good as the record held by any country up to that time. There have been epidemics of contagious diseases, such as measles, mumps, and meningitis, and the total number of cases occurring among 2,000,000 men has been somewhat startling; but when these facts are analyzed and it is found that the mortality in our army is less than the mortality in civil life of the same number of men of the same age, picked by insurance companies, we can realize what splendid results have been accomplished.

The people of this country, the mothers and fathers and wives, whose sons and husbands are in the army and navy, are entitled to know, and it will be a great comfort to them to know, that the health of these men is better looked out for than when they were in civil life, that the dangers that they run from disease are less than when they were in civil life, and that when they are sick or wounded they will receive as good care, as high a class of medical and surgical service, as could possibly be obtained in civil life. This is true because our best men have gone into the medical service, and the Government is providing the medical departments with every facility necessary to give our soldiers the best medical care.

Strikingly successful has been the handling of the venereal problem. A careful examination of the evidence shows that venereal disease is only

about half as frequent in men after they enter the army as in similar groups of individuals in civil life. Certainly no army has ever been mobilized which has been as clean morally and free from venereal disease as the present American army. Associated with this fact and responsible in large part for the splendid showing made is the elimination in large part of drink from the army. Certainly no army has ever been mobilized that has been as free from drinking as the American army. It was fortunate that our mobilization occurred at a time when the amount of drinking in this country was rapidly diminishing, and at a time when most of our States were going on a prohibition basis. Special efforts have been made by the Government in the way of laws that have been enacted for this purpose to prevent drinking in army posts and in territory immediately contiguous to them. This leads me to a consideration of the problem of drinking and prohibition as a purely medical problem.

As we analyze the facts in a scientific and medical way there can be no doubt of the injurious effects of alcoholic drinks on both the physical and the mental well being of our population. There can be no doubt that the greatest single factor that we can control in the interests of the public health of the nation would be the elimination of alcoholic drink.

In the slow evolution of civilization, many great wrongs persisted for centuries because people had become so accustomed to them that they were accepted as matters of course. They became so entrenched that it required either centuries of education or a revolution to extirpate or right them. Great epidemics and plagues were accepted as inevitable and as visitations of God. Government by autocratic power and divine right without the consent of the governed has been tolerated. Slavery with its horrors was defended. The unequal rights of women went unquestioned. Among these great wrongs too long tolerated, none has done more injury to mankind than drink. Events now are moving rapidly in the convulsions of a world war. Women have demanded and will obtain, as they deserve the world over, their equal rights. The course of events is writing the death warrant of autocracy and rule by divine right; and science and education should eliminate not only the plagues and epidemics, but also the curse of drink from the world.

I want to plead for the united action of the organized medical profession of this country to secure protection by law against the injury that drink is doing to our people, not as a political measure, but as the most important public health measure that could be secured. In this crisis when we and our allies are fighting not only for ourselves, but also for humanity and civilization, we must organize the entire nation in the most efficient possible way, and this cannot be done without eliminating drink. Each member of the medical profession as an individual, each county medical society, each State medical society should take an active part in the propaganda against drink, and secure national prohibition, not years from now, but now when it is so badly needed and will accomplish so much good, not only for our boys in khaki and in blue, but for the nation in arms. And when it has once been done away with, it could

no more be resurrected after the war than could slavery.

One of the serious problems now confronting us is the securing of the necessary number of women nurses for our army and navy hospitals. We shall need from 25,000 to 40,000 women nurses. These cannot be secured from the trained and registered nurses of the country and leave a sufficient number of nurses to care for our civilian population. It requires three years of training in times of peace to educate a nurse. But we must remember that in peace times it requires four years' training at West Point and Annapolis to make an officer of the army or navy. In the emergency of this war we are developing splendid officers from well educated, capable men taken from civil life, by intensive short three months' courses in our officers' training camps. The same plan should be adopted in securing the necessary nurses.

There are thousands of well educated, capable young women in this country who are not only willing but are anxious to offer their services to the country. Nurses' training schools can be developed in our army and navy cantonments, where, with an intensive three months' training, these young women can be developed into most useful war nurses, and meet the needs of the Government. The Surgeon General of the army has already taken steps to encourage these nurses' training schools.

Another great problem confronting us is the reconstruction and reeducation of our wounded coming back from the war. Our allies after four years of war, bringing with it hundreds of thousands of cripples, have demonstrated what great good can be accomplished by reconstruction and reeducation. The injured man is reeducated to do some useful work. He is not allowed to drift as a useless wreck, a burden to himself and the community. He is recalled to life by a process of training and reeducation that enables him to earn his livelihood, to occupy his mind and to make life—even with a handicapped body—worth living. Surgeon General Gorgas has been fortunate in securing as the head of this important reconstruction work our own Doctor, now Colonel, Frank Billings, who will have the earnest support of thousands of men and women throughout the country in making this work successful.

An organized effort should be made by the medical profession of the country to secure the creation and maintenance of industries for the production in this country of the necessary drugs and chemicals, surgical instruments and appliances, making this country independent in productions of this kind

of other countries of the world. The securing of such legislation by the national Government as will protect by proper tariff these industries in the process of development is essential. With the 145,000 medical men in this country, with the population and wealth of this country, we are the largest market in the world for drugs, instruments and medical appliances. By proper legislation, industries could be developed so that these products could be made here as cheaply as anywhere in the world, in such quantities as not only to supply our own market but also to enable us to enter other markets and maintain commercially our position in the western hemisphere, especially in this country and in South America.

One matter which the profession should not lose sight of in endeavoring to meet the great demands made by war is the health of our civil population.

The importance of maintaining and increasing and making more effective a national Public Health Service with wide authority, of developing in each county and each State strong public health departments, cannot be questioned. We should demand such State and national organizations for public health and preventive medicine that will secure for our people in a much better way than at present the great possibilities of modern preventive medicine. The war makes this matter not less but more important.

In organizing the medical profession of this country for war there is one fundamental and basic condition that must be secured. We as a profession must go into this war not only efficient, but we must go into it one hundred per cent. loyal, one hundred per cent. American. We are at war with a barbarous and brutal



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autocracy. The American people did not want to enter the war. It was only after the Imperial German Government had murdered our people and destroyed our property and treated our repeated protests with contempt that we prepared to defend ourselves against Germany, as an individual must against a murderer, a highwayman, a thief. We are at war with Germany and Austria. The Germans and Austrians who have chosen to make this country their home must choose between the land of their birth and America, the land in which their children are born. The choice with them is easy. They have chosen their new home, the birthplace of their children, and these men and women we accept gladly as loyal Americans. But there are a few who are not and would give aid and comfort to the enemy, and these must be sought out and interned where they can do no harm. It is the duty of every

medical man and each county medical society to assist the Government in securing the arrest and internment of every disloyal member of the medical profession.

There are in this country some German medical societies, and attention of the Government authorities should be called to these. They should be disbanded at once. We should not permit, now, or in the future, in this country any organizations that further German propaganda. The world has had its lesson with this monstrous thing.

The American medical profession as a whole is more familiar with Germany and the German and Austrian people than is any other class of our countrymen. Thousands of our medical men have studied abroad in the clinics and laboratories of Great Britain and France, of Germany and Austria, of Switzerland and Italy. No other class of people in the world has felt more fully the international brotherhood of science than have American medical men. They have regarded scientific knowledge and scientific discoveries as the property not of one nation but of the world. They have accepted the great discoveries, such as Jenner's of vaccination, the American discovery of anesthesia, the work of Pasteur the great Frenchman, the work of Lister the great Englishman, the work of Koch the great German, the German discovery of the Röntgen ray, the French discovery of radium, the American discovery of the manner of transmission and means of preventing the spread of yellow fever and typhus. They have accepted these and rejoiced that these great discoveries belonged not to one nation or one people, but were contributions to the great international science of medicine. What effect has the war had on this international fellowship of science?

I believe we owe it as a duty to ourselves and to the German medical profession to state clearly the feelings and position of the American medical profession toward them. We can never again hold out to them the right hand of the fellowship of science until the German people drive from power and punish as it deserves the brutal and barbarous autocratic government which is responsible for this war, and create in Germany a government of the people, by the people and for the people. No matter what doubt or confusion there may have been at the outbreak of the war as to the guilt of the German government, the responsibility is today fixed and definite. The refusal to attempt a peaceful settlement before hostilities began, the outrage of Belgium, the invasion of France, the breaking of all international law, the sinking of the *Lusitania*, the evidence and revelations of the long prepared and worldwide plot of Germany to dominate Europe and the world by force of arms, the evidence furnished by the German ambassador to England, Prince Licknowsky, the deliberate attempt of the German government while we were still at peace with Germany to embroil us in war with Mexico and Japan, the murder of Edith Cavell, the use of poisonous gases, the bombing of unfortified towns and cities, the acquiescence in the massacre of the Armenians by their Turkish allies, have all written with the indelible pencil of truth the history of German guilt.

No matter what sophistries the German people

may advance as excuses for these things and for their precipitating war on Belgium, France, England and Russia, we know that these cannot apply to America. We know that there is not a shadow of excuse for their making war on the American people. It required repeated outrages to convince the American people that the German Government was a thing without honor, that we were face to face with a highly organized and efficient autocracy which recognizes no law but the law of the jungle, an autocracy and a people who would rob their neighbors of their fair fields and their factories, their iron mines and their oil wells, an autocracy and a people who combine the frightfulness and moralities of the Hun with science and efficiency of the twentieth century, an autocracy and a people that have been seized with the insane egotism that they are God's chosen instruments to civilize and "kultur" the world, not by education and science, but with the mailed fist and the sword.

To medical men who are accustomed to study diseased bodies and minds, this state of mind of the German government and the German people seems like the insanity of a whole nation. We medical men are familiar with a horrible disease, which begins with an initial lesion acquired in a debauch and which ends often in insanity with delusions of grandeur and magnificence. It would seem as though the German nation was suffering from such a disease, from such a form of insanity. It acquired its initial lesion in the rape and outrage of Denmark, of Austria and of France in the decade between 1860 and 1870. The virus of conquest and domination has coursed through its veins for more than fifty years, and has produced now a diseased national mind with the delusions of egotism and grandeur that are responsible for this world's war.

When the German people waken from the nightmare of the war, they must realize the enormity of the crime they have committed under the spell of the medieval autocratic government that controlled them. They will realize that although they might retain with profit to themselves a province stolen from Denmark or Poland, France or Belgium, they can never dominate with force of arms with profit to themselves for any length of time great nations like Russia and France, England, Italy, Japan, and America. We are in this war, as our great President has said, "to make the world safe for democracy"; and whether it takes one year or ten years, we shall continue the war until the brutal and barbarous autocracy of Germany is destroyed. If the German people could have but a brief period of freedom from their war madness, let them ask themselves if the few miles of Belgium and France and the occupied provinces of stricken Russia can compensate them for making nine tenths of the world their bitter enemy. And they should be made to know that this is not the enmity of a day, the enmity that will disappear with a peace that they hope to compel by force of arms, but that it is an enmity that will last, that will mean for Germany a complete severance of relations, social, commercial, and in every way from ourselves and our allies until Germany has purged itself of guilt, and asks humbly for a place among the nations in which the

people rule. The medical profession of America sends this message to the medical profession of Germany.

To the medical professions of Belgium and France, of England and Italy, of Russia and Greece,



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of Portugal, Roumania, China and Japan, of Brazil and the Central American Republics, to our colleagues in Canada and Australia and New Zealand, and South Africa, and to the other nations who in response to German outrages have joined in war against her, we send a message to hold fast and be of good cheer. Let us tell our medical colleagues among our allies that America with its more than a hundred million free men and women is organizing itself into a great military machine, that all our people, that all our resources, that everything we have is being converted as fast as brains and energy and money can convert them into a weapon with which to win this war, which is now our war. Let us tell them to hold fast and be of good cheer, for America is coming.

America asks nothing for herself. She comes with a clear conscience, a sane national mind, a stout heart and a strong arm. She comes with the single purpose of a united people, a hundred million strong, to punish the murderers of her people and to win this war for civilization and humanity.

Let us send from this meeting of the organized medical profession of America to our great leader in Washington a message, the message that wells up from every farm and factory, from every town and hamlet, the message that echoes and reechoes through our country, from the mountains through the valleys to the sea, the message that is sent by every man and woman of America when our Government calls for their services in this war.

We hear the call of our country. We answer, we are here.

The Scientific Proceedings

We present below abstracts of some of the more important of the papers read at the various section meetings and shall publish additional abstracts in later issues.

SECTION IN OBSTETRICS, GYNECOLOGY, AND ABDOMINAL SURGERY.

Secondary Tuberculous Peritonitis: Its Cause and Cure.—Dr. W. J. MAYO, of Rochester, Minn., said that tuberculous peritonitis was not a primary disease, but, like septic peritonitis, was symptomatic, having its origin in some local focus of infection. The most common sites of such local foci were the Fallopian tubes in women, some part of the intestinal tract in both women and men, and the lymphatic glands and channels, especially in children. Occasionally the primary focus would be found in the stomach, the spleen, the liver, the gall-bladder, or the genitourinary tract. To consider tuberculous peritonitis as an entity or to treat it as such, led to confusion, whereas, if it was regarded as a secondary process, due to some primary focus, one was led to search for the primary focus and to direct treatment leading toward cure.

In tuberculosis the fimbriated extremities of the Fallopian tubes were usually open, quite the opposite from the condition that existed in gonorrheal infection, in which they were closed, forming pus tubes. In tuberculosis the material from the tuberculous process passed out from the open fimbriated extremity of the tube into the abdominal cavity, causing a more or less generalized peritonitis. Such peritonitis was essentially a conservative process



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leading to the destruction of the noxious agents. When the source of the infection could be removed, the peritonum returned to normal. Simple laparotomy sometimes cured the peritonitis when tapping

would be of no avail, because, when the fluid was completely removed from the peritoneal cavity, as by operation, the fimbriated ends of the tubes, which had been mechanically separated by the fluid from the surrounding tissues, might become adherent to neighboring structures, thus closing the ends and preventing further leakage, and tuberculous pus tubes resulted with few symptoms.

Our knowledge of tuberculous peritonitis, the result of tubal disease, was fairly adequate, but, when the local lesion was elsewhere, great difficulty might be experienced in locating and removing the primary source of the peritoneal infection. Rarely in our experience had the appendix been the cause of tuberculous peritonitis. Tuberculosis of the ileocecal coil, especially of the hyperplastic type, was often accompanied by tuberculous peritonitis which, as a rule, was limited to the immediate vicinity of the primary disease, and the removal of the involved bowel promptly cures. This was equally true of localized tuberculosis of the small intestine. In a considerable number of our cases of peritoneal tuberculosis confined to the region above the transverse colon, the lesion was particularly marked in the vicinity of the gallbladder and the pyloric end of the stomach. In several of these cases the gallbladder, which had shown cholecystitis, was removed and the patients were cured.

The possibilities of the cure of tuberculosis of the peritoneum by simple laparotomy, when the local focus could not be discovered and removed, were limited to the ascitic forms of the disease. It might at least be said that an open operation with careful removal of all fluid, with or without medication, had therapeutic value. It would seem, however, that the surgical profession had been over enthusiastic in its praise of the simple operation. The fibroplastic types were benefited only if there were sacculations containing fluid, but operation was contraindicated when the adhesions filled the entire abdomen without collections of fluid, or if the collections consisted of multiple small pockets filled with turbid tuberculous exudate containing a mixed infection. Operation in these cases with separation of adhesions was of little value and often resulted in intestinal fistula. Fortunately the adhesion type of tuberculosis of the peritoneum giving rise to the swollen, hard, or wooden abdomen were most favorable for spontaneous cure.

Infantilism and Other Hypoplastic Conditions of the Uterus.—Dr. EMIL NOVAK, of Baltimore, Md., stated that infantilism of the female genital organs was frequently observed in women, who, aside from the genital organs, presented no recognizable defects in development.

Consideration of the types of uterine hypoplasia was limited to those forms which occurred after fusion of the Müllerian ducts. It was important to remember that hypoplasia might manifest itself in either one of two principal ways, an arrest of growth, or an arrest of differentiation. The principal types to be distinguished are: 1, the uterus fetalalis; the development of the uterus may be arrested in the fetal or embryonic stage, in which case it possessed the characteristics of the fetal uterus;

and 2, the uterus infantililis. This term, strictly speaking, should be restricted to the uterus whose development had been arrested during the period of infancy or childhood, for, as had been shown, the infant uterus did not differ materially in form from that of the child up to the age of puberty. The cervix still definitely predominated over the corpus, but the two were now clearly differentiated. The fundus was much better developed than in the infantile uterus, and its walls were also somewhat thicker. It still lacked, however, the broad convexity which was characteristic of the mature uterus. Antelexion was a common but by no means invariable finding, the angle of flexion being always within the limits of the isthmus. The antelexion was usually of the cervicocorporeal type, the small conical cervix pointing downward and forward in the axis of the vagina, while the fundus was bent forward on the cervix, often at a very acute angle. 3. The uterus subpubescens. In some respects the most interesting forms of uterine hypoplasia were those of mild degree in which the inhibition of development did not assert itself until the prepubertal period. When the ovarian influence, so important at puberty, was tardy in its appearance, the fundus remained undeveloped; that is, there was a persistence of the infantile type already described. In other cases, again, the anatomic defect of the fundus might be so slight as to be scarcely appreciable clinically.

The clinical manifestations of congenital hypoplasia might be conveniently studied under two headings: 1, symptoms associated with the menstrual function—amenorrhea and dysmenorrhea; and 2, those associated with the reproductive capacity (sterility). The treatment of hypoplasia of the uterus was unsatisfactory because it could not in the present state of our knowledge be directed to the underlying cause of the condition. Which of the ductless glands were concerned, what the nature of the disorder was, and how best to correct it—all these problems were still unsolved. The operation most commonly done to relieve primary dysmenorrhea was dilatation of the cervix. Curettage of the perfectly normal endometrium which was practically always found in these cases had neither reason nor advantage. The employment of the stem pessary, advocated by Carstens and others, was not without danger, as Doctor Novak had seen several cases of troublesome endocervicitis following it. To judge from the reports in the literature, however, the results were better than those following simple dilatation. The various plastic operations on the cervix were based upon the erroneous impression that the dysmenorrhea was due to cervical stenosis, and all of them should, therefore, be abandoned.

SECTION IN SURGERY, GENERAL AND ABDOMINAL.

Glycophilia.—Dr. WILLY MEYER, of New York, reported that at the Lenox Hill, formerly German, Hospital, New York, arrangements were made last February in his service for the reception of a limited number of cases of so called thromboangiitis obliterans for the purpose principally of examining the

femur incorporated the essential principles involved in the Hodgen splint. A close study of the mechanical and anatomical factors involved would demonstrate the peculiar applicability of this type of splint to the lower extremity. It was devised for the treatment of compound and gunshot fractures but had proved equally applicable in civil practice where most fractures of the femur were simple ones. The relative value of the several principles of treatment varied with the kind and site of fractures to be treated, age, environment, etc. Immobilizing the seat of fracture was of first importance. Extension and counterextension were the essential and most important factors of treatment. Suspension was peculiarly valuable in compound fractures where treatment of wounds was desired. The mobility of the limb and the patient were of much consequence and physiological flexion at the joints would make for better functional results.

The Hodgen splint was superior to any other because it embodied more principles of treatment and their satisfactory application than any other device. The Hodgen splint excelled because: 1. It immobilized the site of fracture satisfactorily. 2. It gave any requisite degree of extension with counterextension. 3. Abduction, adduction, and varying positions might be secured as the case demanded. 4. Extension was not from a fixed point but within the splint—intraextension—leaving the splint mobile. 5. Physiological flexion was secured preventing hyperextension and muscle strain with consequent bad function or paralysis later. 6. It left the patient freely mobile and the thigh as well. This made comfort for the patient and promoted recovery. 7. Suspension of the limb was obtained, especially valuable in treating compound fractures, facilitating drainage, irrigation, and x ray examinations. 8. It was an open splint, allowing inspection, massage, and care of soft parts. 9. It was easily modified and forces might be applied to meet the indications for treatment of any fracture from the pelvis to the foot. 10. A modification of it as a transport splint for war service could not be excelled.

Use of Dichloramine-T and Other Antiseptics in War Surgery.—Dr. WALTER ESTELL LEE, of Philadelphia, reported, in abstract, as follows: At the Boston meeting of the American Surgical Association in June, 1917, Commander Robert G. Le Conte, U. S. N. R., presented a preliminary report on The Use of Dichloramine-T in the Treatment of Infections and Infected Wounds, which was based upon experimental and clinical work at the Pennsylvania Hospital started in December, 1916, by Dakin, Lee, Sweet, and Hendricks. In September, 1917, Commander Le Conte sailed for overseas duty with his naval base hospital. At this time Major Edward Martin was detailed by the Surgeon General to investigate the clinical value of dichloramine-T in the treatment of surgical infection. Lieutenant Paul A. Lewis, U. S. N. R., Captain William F. Furness, and the writer being assigned to assist him. Dichloramine-T was found to be a germicide which possessed to an unusual degree properties that made it possible to meet the conditions which Dunham said governed the success of disinfection—contact, time, and mass.

The irritation which accompanied the use of most germicides, limiting their use and governing their permissible concentrations, was negligible with dichloramine-T. Dichloramine-T could be used in solutions as strong as ten per cent., the germicidal mass of such a concentration being forty times that of a 0.5 per cent. solution of hypochlorite. Because of its peculiar stability in oil solutions and unusual speed of disinfection, the required time for contact with the infecting organisms was readily maintained. Under average conditions its germicidal activity lasted about eighteen hours in contrast to the thirty to sixty minutes of Dakin's hypochlorite solution. Dunham found that its speed was eight times that of hypochlorite, 800 times that of a 1:1,000 solution of bichloride of mercury and at least 2,880 times that of a two per cent. solution of carbolic acid. The development of a mechanical method to obtain, in infected wounds, the all important contact between this agent and the infecting organisms was entrusted to the writers by Doctor Dakin. At the present time records have been obtained from 18,700 completed cases in civil surgical practice in which this agent was used. These patients were treated in the Pennsylvania, the University of Pennsylvania, Germantown, Children's, and Bryn Mawr hospitals, and in the accident services of the Midvale Steel Works and the Remington Arms Company, Dr. Robert P. Cummings and Dr. George B. Sickel directing the work at the latter places.

After fifteen months' work with a total of 18,700 cases the following conclusions were reached: 1. The use of dichloramine-T had definitely improved the results obtained in the primary closure of traumatic wounds of the soft tissues, bones, and joints. 2. In the treatment of superficial accessible surgical infections the use of dichloramine-T had uniformly given better results than any other germicide employed. The method of its application was simpler and the dressings more economical than with any of the other chlorine agents. 3. The best results with dichloramine-T could only be obtained when actual chemical contact of the germicide with the infecting organisms was maintained. To maintain such contact in superficial surgical infections was a simple matter and in the first few months of the work a satisfactory technic for this class of wounds was developed. In deep and inaccessible infections the problem was more difficult and the greater part of these fifteen months had been devoted to this aspect. 4. Confidence in the germicidal value of dichloramine-T had so developed that when it did not control infections it was thought that the chemical contact had not been maintained, the mass of the germicide employed had not been sufficient, or adequate surgical treatment had not been given. 5. The striking detoxicating effect of the chlorine group of germicides which had become common knowledge through the general use of Dakin's hypochlorite solution, was just as satisfactorily exhibited with dichloramine-T.

Temporary Loss of Voice Following Thyroidectomy.—Dr. DONALD GUTHRIE, of Sayre, Pa., said that the principal causes for loss of voice following thyroidectomy were: 1, trauma to the laryngeal nerves; 2, trauma to the trachea and

larynx; 3, lues, and 4, hysteria. Operation should be planned to avoid any trauma to the nerve or trachea. Laryngoscopic examination before and after operation was important. Abductor and adductor paralysis should be detected. A Wassermann test was very valuable. Patients should be so handled psychologically as to avoid postoperative hysteria.

The treatment of this condition was described and a few cases were reported. The paper closed with a review of Judd's and New's recent work on injury to the nerves.

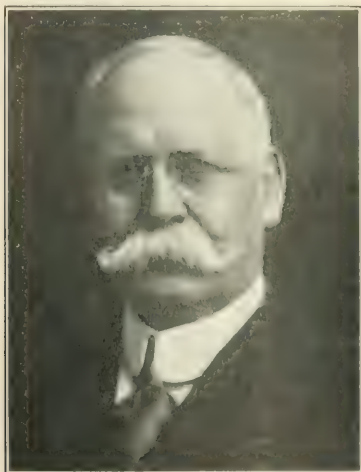
Operation in Gunshot Abdominal Wounds.—

Dr. JOSEPH RILUS EASTMAN, of Indianapolis, Ind., said that though the experiences of the present war have modified old views as to the advisability of abstention in abdominal wounds, there still remained, notably in France, a rather sharp division between what were designated the abstentionists and the interventionists, the former group basing diagnosis of penetration and perforation, as well as treatment, on the evolution of symptoms, the latter group making the complete diagnosis by laparotomy, and applying immediately, or within the first few hours, the appropriate surgical treatment. Unfortunately, the most experienced surgeons occasionally found more or less difficulty in diagnosing penetration and perforation before operation, and all were, of course, opposed to precocious operating in nonpenetrating wounds. An aperture of exit was not always present, in which case it was difficult to determine the course of the missile. All missiles might ricochet.

There were a few recognized rules to follow; for example, the closer together the wounds of entrance and exit, the less the chance of penetration, and Rochard declared that if a wounded man did not cease to complain of abdominal pain, perforation



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Doctor Eastman witnessed wounds in which, if the missile had traversed by the shortest route between the two openings, there would have been perforation of many vital organs and structures, and yet there was no serious injury.

was almost certain. Rochard also said that if a patient passed gas at the anus, there was no perforation. All rules failed sometimes, with the exception of these three which proved the existence of perforation: escape of bowel contents from the wound of entrance or exit, protrusion of perforated gut at the wound, and passing of the missile by the anus. Schwartz and Mocquot described four cases of perforation showing no signs. Doctor Eastman observed the case of a man with perforating wound of the abdomen who continued active duty for several hours after receipt of the wound, having no knowledge of the injury.

At the beginning of the war nearly all surgeons were abstentionists. For example, on August 10, 1914, in an address to the Academy of Sciences, Delorme advised against intervention, saying that experience in the Transvaal, Manchurian, and Balkan wars justified the expectant plan, but the records of the interventionists were the better in this war. It should be noted that the interventionist verified his diagnosis of perforation, or, in the French nomenclature, penetration with injury of the viscus; whereas, the abstentionist might designate as perforation cases some which were not perforative. M. Chevassu, who was an abstentionist, not by choice but by unfavorable circumstances, had only twenty-seven deaths in eighty-five penetrating gunshot wounds, but according to French writers, many of these were doubtless cases of simple penetration without any injury of an important viscus. Moreover, the interventionist's deaths occurred promptly and were counted against him, whereas, the absten-

tionist's deaths were often late, as from fistula, and were not counted.

In support of intervention, the Interallied Surgical Congress of last March expressed the view which was the most authoritative available, that all intestinal wounds should be treated by laparotomy, with suture. Most surgeons reserved the suprapubic buttonhole drainage, which the French called the operation of Murphy, and which the Germans ascribed to Fayr, for cases of simple penetration without perforation.

SECTION IN DERMATOLOGY.

Miliary Tuberculosis of the Skin, Lichen Scrofulosorum and Papulonecrotic Tuberculides.

—Dr. FRED WISE, of New York, pointed out that many of the varieties of cutaneous tuberculosis are exanthematic, particularly miliary tuberculosis, lichen scrofulosorum, the sarcoids, erythema induratum and the papulonecrotic tuberculides. He emphasized especially the miliary, lichen, and tuberculide groups. It has been demonstrated that these forms often contained tubercle bacilli and were in effect true tuberculosis. The evidence has been acquired, both histologically and through animal experimentation. Their pathogenesis was not as yet entirely explained but it was likely that the bacilli were disseminated either by the blood or lymph stream or both, hence pathogenically they represented a bacteriemia with skin embolism but not a true sepsis. Very often skin manifestations were incidental to visceral tuberculosis. Often enough, the true conditions appeared as complicating factors to other forms of skin tuberculosis, notably lupus vulgaris and scrofuloderma.

Dermatosis Possibly Related to Tuberculosis.

—Dr. JOHN LANE NEWTON, of New Haven, and Dr. MAX SIEBER, of New York, discussed the relationship of the erythedermas, lichen, lupus erythematosus, and many other less important conditions to tuberculosis. They pointed out that these conditions had been widely assumed by many writers to be in some way associated with tuberculosis, belonging in the group of so called toxituberculides. They exhaustively criticized this with reference to lupus erythematosus. The literature contained statements to the effect that such a relationship had often been noted, but the writers pointed out that the proportion of cases in which this was true to the proportion in which it was not true was very small. They concluded, therefore, that on the whole no sweeping conclusions could be drawn as to the tuberculous origin of lupus erythematosus. On the contrary, they believed the weight of evidence pointed to the fact that lupus erythematosus was either a cutaneous reaction to numerous causes or the result of the consistent pathological mechanism still unknown. They followed a similar line of reasoning with reference to the other conditions they discussed but pointed out that in the erythedermas Brusgaard published a classical case clinically resembling pityriasis rubra of Hebra in which tubercle bacilli could be demonstrated in sections.

The Too Intensive Salvarsan Treatment of Syphilis.—Dr. MEYER L. HEIDINGSFELD, of Cincinnati, Ohio, said that originally in the light particularly of the difficulty of obtaining salvarsan under

the present world wide conditions, he undertook the investigation of its real therapeutic and comparative value. He selected 1,133 cases of syphilis and considered them from both the clinical and laboratory point of view. He noted particularly the comparative results of intensively and conservatively treated cases. The intensive salvarsan therapy proved, in the opinion of the writer, to be very disappointing. There was relatively very much greater success in the conservative treatment. Intensive and conservative mercurial treatment of the past had proven that the disease early acquired tolerance to this and other therapeutic agents. In pursuance of this fact, laboratory investigation demonstrated an early acquired immunity of the *Treponema pallidum* to salvarsan, neosalvarsan, mercurials and the iodides. Further investigation showed that this immunity was rapidly lost when these agents were temporarily withdrawn. Clinical experience confirmed these laboratory results.

Experimental Therapy of Syphilis.—Dr. WADE H. BROWN, and Dr. LOUISE PEARCE, of New York, reported the results of some investigations they had been carrying on in collaboration with Dr. Walter A. Jacobs and Dr. Michael Heidelberger. By their combined efforts they had succeeded in developing a number of substances which had proven highly active under experimental conditions, the chief among them being a substance called A-189. Comparison of the toxic and therapeutic action developed by this substance, with like results obtained with salvarsan, neosalvarsan, galyol, and luargol gave hope that it might prove to be a useful addition to the therapeutic armamentarium for the treatment of syphilis. Few human diseases lent themselves so well to therapeutic experimentation in laboratory animals as syphilis and with recent years a great deal had been accomplished by experimental therapeutic studies of this disease. The efforts which had yielded the best results had been directed toward the construction of chemical agents which would enhance the native therapeutic powers of such elementary substances as arsenic, antimony and mercury. There was wide difference of opinion both as to the behavior of salvarsan, neosalvarsan, galyol, and luargol and as to their relative merits in the treatment of human syphilis.

Early Diagnosis and Immediate Treatment in Preventing Neurosyphilis.—Dr. JOHN A. FORDYCE, of New York, called attention to the frequency of neurosyphilis and its tremendous significance to both the syphilographer and the neurologist and especially to those members of the Medical Corps of the army trained in modern methods of diagnosis and treatment. It had a vast economic importance also as was shown by the statistics, both old and new, and the number of familial types of neurosyphilis emphasized this aspect. If one were on the lookout, they would invariably detect at which stage of the infection nervous system involvement occurred, but the symptoms were very frequently overlooked or attributed to other causes. Before the stigmata of degeneration appeared the symptoms might persist for a very long time. As as diagnostic and prognostic measure and as a guide for treatment, too much value could not be placed on the supreme importance of spinal fluid examination.

Dermatoses Attributed to Focal Infection.—

Dr. M. L. RAVITCH and Dr. S. A. STEINBERG, of Louisville, Ky., said that the importance of focal infection in relation to certain dermatoses compelled them to extend their studies on this subject, give additional findings, and correct some views reported in the paper of one of the writers at the Detroit Session, 1916. The authors still held that the subject was a rich field for further investigations into obscure dermatoses. However, the dermatologists in their desire to clear up the many problems of diagnosis and etiology and in their efforts to place their treatment on a really scientific and rational basis, had more than once gone to extremes in taking up new fads and theories. A theory was proclaimed one day and renounced the next. It was preposterous to state that the majority of dermatoses were due to focal infection. It was bad enough to be offered the mere presence of a focus of infection as proof of connection with the dermatosis without being offered the statement that the absence of a focus was proof of the same connection. In the first place the mere coincidence of any dermatosis with foci of infection should be considered as suggestive only. Not all dermatoses, frequently mentioned in dermatological literature, could be attributed to focal infection. The authors disagreed with some writers that psoriasis, lichen planus, vitiligo, herpes zoster, alopecia areata, and psoriasiform seborrhea were due to focal infection. In careful checking up of tabulated cases of urticarias, erythemas, purpuras, and eczemas, they concluded that only a very small percentage of these dermatoses could be attributed to focal infection. They plead for a more conservative study of such cases and warned against false interpretation, exaggeration,

SECTION IN PHARMACOLOGY AND THERAPEUTICS.

The Diet of the United States Army Soldier.—

Dr. JOHN R. MURLIN, of Washington, D. C., chief of the Food Division, Sanitary Corps, stated that the diet of the soldier in training in military camps in this country was perhaps the most liberal ever pro-



Major, M. R. C.



ALEXANDER DUANE, M.D.,
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geration, and overenthusiasm. While drawing conclusions from carefully tabulated statistics, the authors did not consider their conclusions as final, as conclusions based on present day knowledge might not be correct tomorrow.

vided for any army. The garrison ration, which was the basis of the allowance for subsistence of one man for one day, provided at the present market prices in the neighborhood of forty cents, which might be spent for each soldier's food. Bread, meat, and a few other articles were issued to the mess-houses each day. Other articles carried by the quartermaster were issued in ten day periods. Besides these articles the mess sergeant was at liberty to purchase in the local markets. The garrison ration was an average of about 100 pounds of food for each man. Of this, seventy per cent. was issued as beef or other fresh meat, twenty per cent. as ham, and ten per cent. as butter. The garrison ration also included eighteen ounces of bread. The actual consumption of these articles, however, was much less than these amounts. Results of nutritional surveys made in more than forty camps and covering in the neighborhood of 100,000 men showed that about eleven and a half ounces of fresh meat on the average were consumed by each man each day and three and a half ounces of bread. The actual consumption of the rationed food was much less than the garrison ration.

ounces of breakfast cereal, 2.4 ounces of beans or other legumes, one ounce of rice or other starch furnishing cereals, twelve and a half ounces of potatoes, etc. The total energy supplied was in the neighborhood of 4,000 calories, of which some seven per cent. was wasted, leaving a net consumption of nearly 3,700 calories. The average cost of this food, as selected by the mess sergeant, is \$0.4275. The value of the waste in terms of the original cost is 3 cents.

Chemical Groups in the Active Constituent of the Thyroid which Are Responsible for Its Physiological Activity.—Dr. E. C. KENDALL, of the Mayo Foundation, Rochester, Minn., stated that the physiological activity of the thyroid secretion could be produced by the administration of a single chemical substance which had been isolated from the thyroid. This compound contained sixty-five per cent. of iodine which had been shown to be attached to a derivative of indol. The administration of this substance produced increased basal metabolic rate, increased nervous irritability, and all the well known symptoms following the administration of desiccated thyroid. It had been analyzed, and the chemical groups present in the molecule had been determined. The chemical formula of the substance in the highest probability was triiodotrihydroalpa oxyindolpropionic acid. A discussion of the active groups in the molecule and the relation of this substance to protein metabolism and other problems in metabolism was presented.

Diet in Pellagra.—Dr. JOSEPH GOLDBERGER, Dr. G. A. WHEELER, and Dr. EDGAR SYDENSTRICKER, of the U. S. Public Health Service, presented a study of the diet of nonpellagrous and of pellagrous households in textile mill communities in South Carolina, in 1916. To supplement the studies, chiefly experimental, of 1914 and 1915, a study was begun, in the spring of 1916, of the relation of various factors to pellagra prevalence in cotton mill village communities in South Carolina. This paper presented briefly some of the results of the phase of the study dealing with the relation of household diet to pellagra incidence. Pellagra incidence was determined by a systematic biweekly house to house search for cases, carried on from April 15, 1916, to December 31, 1916. The diagnosis of pellagra was restricted to cases presenting a definite, bilaterally symmetrical eruption. It was suggested that, so defined, pellagra included at least two commonly associated, etiologically distinct though closely related, syndromes. Data relating to household diet were secured by obtaining records of sale from the principal stores for a fifteen day sample period during the season immediately anterior to or coincident with the incidence of the attack as suggested by the seasonal curve, supplemented by inquiries by trained investigators. Comparisons of diets of nonpellagrous with those of pellagrous households clearly showed the following points: 1. The nonpellagrous enjoyed a larger supply of the animal protein foods—lean meat, milk, including butter, cheese, and eggs. 2. Varying supplies of fresh meat were associated with a corresponding—inverse—variation in pellagra incidence. 3. Varying supplies of milk were associated with a corresponding—inverse—variations in pellagra incidence. 4. The cal-

oric value of the diets of pellagrous households was somewhat less than that of nonpellagrous households, but this, nevertheless, conformed to recognized standards and could therefore not be considered as an essential factor in relation to pellagra incidence. 5. The total protein supply in the diets of the pellagrous households was somewhat less than in that of nonpellagrous households, but was not below Chittenden's standard, and therefore a deficiency in total protein would seem not to be an essential factor in relation to pellagra incidence. 6. The proportion of protein from animal food was somewhat smaller, and that from cereals and the common mature peas and beans somewhat larger in the diets of pellagrous than in those of the nonpellagrous households, and therefore the protein in the diet of the nonpellagrous was likely to be of somewhat better quality than that in the diets of the pellagrous households. 7. The diets of the pellagrous households included somewhat less of the carbohydrates than did that of the nonpellagrous, and therefore the production of pellagra is not necessarily dependent on an excessive consumption of this food constituent. 8. The diets of the pellagrous households had a decidedly smaller supply of the fat soluble, and likewise a somewhat smaller supply of the water soluble vitamins, than the diets of the nonpellagrous households. 9. The mineral constituent of the diets of the nonpellagrous households was likely to be superior, less likely to be defective, than that of the pellagrous households. The indications afforded by this study would seem very clearly to suggest that the pellagra producing dietary fault is the result of some one or, more probably, of a combination of the following factors: 1, a physiologically defective protein supply; 2, a low or inadequate supply of fat soluble vitamins; 3, a low or inadequate supply of water soluble vitamins; and, 4, a defective mineral supply. In this connection it is of interest to note that McCollum (1918, p. 421), as a result of his studies of faulty diets in rats, believes that pellagra is primarily associated with the unsatisfactory character of three dietary factors, namely, a shortage of the "fat soluble A," the faulty character of the inorganic moiety, and the relatively poor quality of the protein mixture. The somewhat lower plane of supply of the pellagrous households, both of energy and of protein, though apparently not an essential factor, may, nevertheless, be contributory by favoring the occurrence of a deficiency in intake of some one or more of the essential dietary factors, particularly with diets having but a narrow margin of safety in some respect or respects. The pellagra producing dietary fault may be corrected and the disease prevented by including in the diet an adequate supply of the animal protein foods, particularly milk, including butter, and lean meat.

SECTION IN NERVOUS AND MENTAL DISEASES.

Mental Therapy in Epilepsy.—Dr. L. PIERCE CLARK, of New York, stated that only recently have studies disclosed that the main tenets of the epileptic constitution were present years before the nervous disorder as such were shown in fits, some part of these defects of personality being shown in earliest childhood. It was commonly held that

even the first grand mal fit indicated that the epilepsy was already chronic, and only too often defied any and all forms of treatment. We could profit by this knowledge only by steadily educating parents and relatives to recognize the earlier and more benign presence of epileptic reactions, such as lethargies, twilight states of petit mal, pathological absentmindedness, crass rages and tantrums, and other excessive morbid emotional states. It was obvious to the careful observer that the fit itself was a reaction away from the excessive stress which might have increased the nervous and mental tension. Usually it was not the degree of stress *per se*, but the amount of repression which the epileptic exercised, that springs the fit gun. From more recent studies we had analyzed spontaneous productions, or mental content, of the petit mal attacks, from which one might find the particular types of stresses which irritated the individual epileptic. These, as well as the deeper strivings which might be recovered in the fit, furnished data upon which one might construct a rational reeducational therapy of the broadest, yet specific moment. The basic idea in such studies was to determine the particular kind of defective makeup and its specific conflicts in everyday life. We then tried to induce the epileptic to gain better insight as to the sequence and consequence of his crude handling of life, thus further fortifying him against possible recurrences of his psychotic episodes.

Pituitary Disturbance in Its Relation to the Psychoses of Adolescence.—Dr. BEVERLEY R. TUCKER, of Richmond, Va., gave a general description of the functions of the pituitary gland and of

taken up. Pituitary adolescent psychoses were divided into four groups: 1, those with a preadolescent history of hypersecretion, in which during adolescence the secretion was apparently still further increased; 2, those with a history of normal secretion



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hypersecretion, in which during adolescence this secretion was markedly diminished; 3, apparently normal preadolescent cases in which the secretion during adolescence is increased, and those with an approximately normal preadolescent pituitary history, in which during adolescence the secretion is diminished; 4, those cases with a history of preadolescent decreased secretion in which during adolescence the secretion is apparently still further decreased. Cases were cited with radiographic findings to illustrate these groups and a description of their psychoses given.

SECTION IN DISEASES OF CHILDREN.

Pertussis Vaccine Controlled by the Complement Fixation Test.—Dr. E. J. HUENEKENS, of Minneapolis, Minn., made a further report on this work, a preliminary report of which was given at the New York meeting of the American Medical Association, 1917. Pertussis vaccine from two to three months old employed in very large doses, one billion and over, immunized in only 12.5 per cent. of cases. Two to four weeks old vaccine conferred immunity in from twenty-five to seventy-five per cent. of cases. Freshly prepared vaccine employed in the same dosage showed evidence of antibody formation in ninety-four per cent. When used in still larger doses, one, one and one half, and two billion bacteria, 100 per cent. positive reactions were obtained. The antibodies were demonstrable within one week after the last injection. The following conclusions, therefore, seemed warranted: 1. Pertussis vaccine should be employed only when freshly prepared and without preservative. By fresh vaccine was meant a vaccine less than one



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its anterior and posterior lobes. The period of adolescence and the physiological disturbances of the pituitary secretion occurring at this time were discussed. The pathological disturbances of the pituitary secretion causing the psychoses were then

week old. 2. The most effective dose was one billion, one and one half billion, and two billion, given on alternate days for three doses. 3. It was most effective as a prophylactic, but should be of great value in the early catarrhal stage of pertussis. 4. In doubtful cases the vaccine should be administered before an exact diagnosis could be made, especially during an epidemic or where there was a history of previous exposure.

Treatment of Prematurity.—Dr. ROOD TAYLOR, of the Mayo Clinic, Rochester, Minn., reported that of sixty premature infants twenty-four died, a gross mortality of forty per cent. Fourteen deaths occurred on the first day. Of the forty-two babies living longer than five days, six died, the mortality among those living longer than five days being fourteen per cent. The babies were fed breast milk only on the four hour interval, and when necessary were fed by tube. Feeding was begun on the second day. Vomiting was regarded as the first warning of overfeeding, and care was taken not to exceed the babies' tolerance for food. The babies were protected against infection by an aseptic nursing technic. They were kept warm, not in an incubator, but in a blanket lined clothes basket furnished with thermometer and hot water bottles. Care was taken to prevent any initial chilling.

SECTION IN OPHTHALMOLOGY.

Some Aspects of Military Ophthalmic Surgery.

—Dr. G. E. de Schweinitz, lieutenant colonel, Medical Corps, described first the eye centres in the British Expeditionary Forces and the technic of the management of eye cases at the front and at the base. A description was given of a French base eye department housed in a hospital devoted to surgery of the eye, ear, nose, and throat, oral and plastic surgery, and cerebral surgery. Discussing the character of ophthalmic cases which he had observed, the speaker referred to the large number of refractions which were required, the method of managing these cases in British eye centres, the supply of glasses, provided for in an optical shop which was attached to each one of such centres, and the method by which our forces would be supplied in this regard. Reference was made to the unusual number of cases of various types of herpetic keratitis seen among soldiers coming from the front, probably due to neuritis of the corneal nerve filaments; to the severe conjunctivitis with white edema of gassing, especially of lachrymal gas and mustard gas, and the comparative infrequency of serious corneal changes, although minor changes were often present, but sometimes corneal opacity, severe keratitis with ulceration and even destruction of the eye; to the various treatment of gas conjunctivitis, preference being given to a one per cent. solution of bicarbonate of soda, ordinary saline irrigations, and the use of alboline and liquid paraffin; to the frequency of contusion hypotony; to the fact that only trivial external lesions might be present when gross deeper disturbances have been produced; and to the practical fact that decided hypotony might be noted although there was no penetrating wound of the globe. He discussed primary simple enucleations, primary enucleations with implantation,

magnet extractions, extraction of foreign bodies from the orbit, and plastic operations. It was pointed out that an ophthalmic surgeon should always be present at an evacuation hospital, or casualty clearing station, whose judgment should be secured in the decision of whether the eye should be enucleated at the front, in other words, to check any tendency to too speedy an enucleation. Various forms of prosthesis were discussed, the preference of many surgeons abroad being strongly in favor of natural tissues in place of glass or metallic prosthetic globes. Cartilage grafts, secured either from the patient's rib, or from a calf or lamb rib, and then kept in a formalized solution, were described.

All hospitals should be provided with magnets of strong pulling power, for example, a Haab magnet, or a large Lancaster model, or the model recently prepared by Colonel Lister of the British service. In the British service the anterior route was preferred, except where the body was very turgid. In one French hospital, however, after x-ray localization, the extraction was always made through a small scleral wound, and the results were unusually good. Extraction of foreign bodies from the orbit through a modified Krönlein resection of the orbital wall was referred to, and also the difference of opinion which existed among various surgeons as to orbital exploration, and to the fact that often exploration of the orbit produced results which were disastrous.

Describing plastic work, the excellent results of cartilage prosthesis were mentioned; the employment of dental modeling composition, usually called "stent," as a support for Thiersch grafts; cartilage props in facial plastic work; "cartilage carriers," the patient's rib cartilage being imbedded beneath the skin of the abdomen or forehead until required for use; cartilage preservation—Magitot's method—in formol; unusually large cutaneous flaps taken from the chest for facial plastic work, nourished by long pedicles cut along the line of the sternocleidomastoids; and the epithelialization of raw areas by wrapping large Thiersch grafts around suitably shaped moulds of "stent," which are removed usually at the end of eight or ten days, by which time the grafts have taken, or, rather, the epithelialization has occurred. He described the splendid plastic work in a famous hospital in England which was staffed by English, Canadian, Australian, and New Zealand surgeons, and especially the admirable results of Major Gillies and his colleagues in this type of work.

Astigmatism Against the Rule.—Dr. JOHN GUEN, Jr., and Dr. WILLIAM F. HARDY, of St. Louis, Mo., concluded independently that the incidence of inverse astigmatism was greater than generally surmised. The question naturally arose, what constituted astigmatism against the rule? Conflicting definitions did not make for accuracy in compiling statistics. The ground was taken that an astigmatism was either with the rule or against the rule, oblique astigmatism being ruled out in the interest of simplicity. All cases of astigmatism with the meridian of greatest curvature at any point on the arc from 46° to 134° were designated astigma-

tism with the rule. Those from 0° to 44° and from 136° to 180° were classified as astigmatism against the rule. The systematic use of Lancaster's charts demonstrated the inadequacy of former methods and revealed a surprisingly large number of cases of inverse astigmatism. These charts were of service both in the cycloplegic and noncycloplegic tests. The authors did not disparage the manifest refraction, but rather insisted on it as a precycloplegic and postcycloplegic procedure. Low grades of astigmatism were often difficult of exact measurement and for that reason errors of 0.12 D. were excluded. The patient's selection of the line on the astigmatic chart largely determines the axis of the cylinder. This was true of errors in excess of 0.75 D, but was not to be depended upon in errors of less amount. Astigmatism, the result of any operative or pathological procedure, was rigidly excluded. The fundi were always examined and the muscle balance usually ascertained. No direct relation appeared to exist between imbalance and inverse astigmatism. Many cases of inverse astigmatism seemed to be lenticular in origin. This was particularly true, it seemed, in low degrees. There was a greater interference with visual acuity in the case of inverse astigmatism than in the case of an astigmatism of equal amount with the rule. It did not follow that every eye presenting inverse astigmatism should have this anomaly corrected. Elderly patients comfortable with spheres, but rendered uncomfortable or confused with the introduction of a cylinder, should be let alone. Inverse astigmatism appeared to predominate in females. The present study was based on a review of astigmatism occurring in 1,024 eyes with an error of 0.25 D or more.



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Of these 741, or 72.3 per cent., were with the rule and 283, or 27.7 per cent., against the rule. The number of patients with astigmatism against the rule was 182, of whom sixty-nine were males and 113 females. This refractive anomaly was present

in one eye in eighty-one patients; it was present in both eyes in 101 patients. Inverse astigmatism was found in no child under ten years of age. Between one and forty years astigmatism against the rule was found in eighty-nine patients, whereas between forty



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and eighty years, ninety-three patients presented this anomaly. The prevailing refractive error was compound hyperopic astigmatism in 180 eyes, followed by hyperopic astigmatism forty eyes, compound myopic astigmatism thirty-five eyes, myopic astigmatism seven eyes, mixed astigmatism twenty-one eyes. Cycloplegics were used in sixty-eight patients, 114 were examined without cycloplegia. The symptomatology of inverse astigmatism was variable and indefinite. Great relief often followed the wearing of the appropriate cylinder.

The following conclusion were drawn: 1. The percentage of inverse astigmatism was larger than was generally surmised. 2. The preponderance of females in the ratio of about two to one was surprising, but had been confirmed by others. 3. As noted by others, inverse astigmatism was not observed in children under ten years of age. 4. Inverse astigmatism may be present from birth to middle age, as from middle age to old age. 5. Many patients tolerated a moderate inverse astigmatism in the past years, but when symptoms referable to the refractive error first manifested themselves, the detection of inverse astigmatism was at times difficult with ordinary means, and very often within the competency of the oculist and only in rare instances being detected by the refracting optician. 6. No special symptomatology could be attached to inverse astigmatism, the complaints being diverse and often indefinite. 7. Lancaster's charts were of inestimable value in the study of low grades of inverse astigmatism.

Blood Cysts of the Orbit.—Dr. HAROLD GIFFORD of Boston, Mass., stated that blood cysts of the orbit were not common, and when they occurred

were apt to be mistaken for more serious forms of tumor. It was important to remember the possibility of their occurrence since the failure to recognize the nature of the tumor at the time of the operation might lead to unnecessarily severe and extensive operations with danger to the eye. To avoid such a mistake, it was advised that all tumors of the orbit, on being exposed at operation, should be punctured, and if this showed the tumor to be either a blood cyst or some other form of cyst, it was advised to evacuate the contents, swabbing out the interior thoroughly with pure carbolic acid, following this with alcohol. Two cases illustrated the efficacy of this procedure. The patients recovered with normal or nearly normal sight. Another case proved to be a multilocular blood cyst with coagulated blood, which, after a definite resection of the outer walls of the orbit, was removed like any ordinary solid tumor with retention of normal sight. Before making the puncture in these cases, it was important to secure the tumor with a strong suture so that if the tumor collapsed it would be easy to find the cavity.

SECTION IN PATHOLOGY AND PHYSIOLOGY.

Further Experimental Study of Surgical Shock.

—Dr. F. C. MANN, of the Mayo Clinic, Rochester, Minn., said that the term shock was used by the surgeon in describing a definite clinical condition: it was due probably to a number of causes. However, in general, all cases might be included in two groups. One group contained the cases in which the clinical manifestations followed some time after the occurrence of the conditions incident to the shock. The other group included the cases in which a severe or fatal condition supervened immediately on receipt of the active agent. Experimentally, either condition could be produced by few of the methods which might be compared to their clinical manifestations. Chief of the methods by means of which a condition simulating the cases included in the first group could be produced experimentally was exposure of the abdominal viscera. The symptoms thus produced were due to a loss of circulatory fluid, probably owing to, or associated with, a failure of the mechanism to control fluid volume. The signs of shock might be produced by the loss of an amount of circulating fluid which could be sequestered into capillary beds or venous trunks of the four limbs. The part the nervous system played in the cause of shock was undetermined. It could not be proved beyond doubt experimentally that shock was an etiological factor, although clinically it seemed to be definitely established that it was responsible for death in some cases, and in such cases it would probably be found to be of the nature of inhibition. This group might include a large number of the cases contained in the second group. Experimentally, sudden death had been found to occur under deep etherization following stimulation of the nerves which inhibited respiration. It had also been produced under light etherization by the stimulation of nerves which produced a reflex inhibition of the heart. Either of these results might also occur clinically, and the cause of death be described by the surgeon as shock. In the treatment of shock, ex-

periments had not shown that the use of drugs, either as stimulants or as vasoconstrictors, possessed much value. The logical procedure, at least from the experimental standpoint, in the cases included in group one, would seem to be to attempt to replace the lost fluid. The best means of doing this was by the intravenous injection of large amounts of whole blood or blood serum. Some of the artificial solutions gave good results. The ideal artificial fluid should contain some substance to increase colloidal properties, alkaline salt, and glucose.

The House of Delegates

Dr. HUBERT WORK, of Pueblo, Colo., in the Chair.

The House of Delegates of the American Medical Association held its first meeting for the sixty-ninth annual session of the association, on June 10th, in the Library Hall of the American Medical Association Building. After a preliminary report of the Committee on Credentials various reference committees were announced. The chairman of the house delivered an address, stating that the successful career of the association with the proud position its *Journal* occupied with both the medical and lay press was a tribute to the previous selection of officers, yet he believed that the members of the house should activate their obligations to the association between annual sessions. Although the American mind was sensitized by war, the profession must proceed coherently. The burdens the war had imposed upon the profession were heavy, but we must also forecast the medical problems of the peace to follow, which would tax every resource of our decimated ranks. Our losses by the hand of time, by casualties, and of our premedical students would lay a heavy hand on us afterward. No one could now be found to say that we would not win the war, or that the United States no longer produced the type of men the nation's history was builded around. The two generals through whom the medical profession served would alone disprove both hypotheses.

The secretary, Dr. Alexander R. Craig, presented his report, stating that the fellowship of the association on May 1, 1917, was 44,010. During the past year, 447 fellows had died, 2,058 had resigned, 312 had been dropped as not eligible, 521 had been dropped for nonpayment of dues, and fifty-four had been removed from the rolls on account of being reported not found, making a total of 3,592 names to be deducted from the fellowship roll. With the additional names to the fellowship roll, the fellowship of the association on May 1, 1918, was 44,715, a net increase for the year of 705. The membership of the various constituent state associations, which constituted the membership of the association was up to May 1, 1918, 80,248.

Report of the Board of Trustees.—Dr. THOMAS McDAVITT, of Minnesota, chairman, presented this report, stating that on January 1, 1917, the number of subscribers of the *Journal* and fellows was 65,661. The actual number of copies of the *Journal* printed for the year was 3,504,724, or a weekly average of 57,400. The number of subscribers in

foreign parts was increasing year by year. The financial condition of the association was very satisfactory.

Council on Health and Public Instruction.—Dr. FRANK BILLINGS, of Illinois, chairman, presented this report. The entrance into the service of nearly 20,000 physicians as officers of the Medical Reserve Corps would insure in the future a degree of discipline and cooperation in the medical profession that had heretofore been impossible. The council confidently anticipated a degree of public interest and of constructive effort along public health lines following the war such as had never been possible before in this country. To meet this situation, it was more than every necessary that the organized medical profession should be represented in this field by a permanent board capable of carrying on a definite constructive policy, looking toward the development of the largest amount of cooperation between the organized medical profession on the one hand and the general public on the other.

Council on Medical Education.—Dr. H. D. ARNOLD, of Massachusetts, chairman, stated that during the last fourteen years the progress of medical education had been decidedly improved. Largely through the merging of two or more colleges into one in each of many instances the sum total of medical schools had been reduced to what was more nearly the normal supply for this country. Most of the medical schools at present were stronger and better equipped in every way. Of all the improvements enumerated, the one of greatest importance was the increase in entrance requirements. Even for army purposes the great demand was not so much for ordinary physicians or surgeons as for

ciation was presented by the secretary, Doctor Craig. The committee was gratified to note the prompt and altruistic response of the profession to every appeal which the association had made to the medical profession of the United States to serve in winning the war. All of these reports were referred to their respective Reference Committees, action on which was to be taken at a subsequent session of the house.



R. A. FIEGENBAUM, M.D.,
President of the Chicago Medical Society.



CHARLES E. HUMISTON, M.D.,
of Chicago, Ill., President of the Chicago Medical Society.

those of highly technical and special training. At the conference held in February, the chairman presented a scheme for a continuous session in medical schools for the duration of the war.

The report of the War Committee of the Asso-

The Reference Committee on Medical Education recommended that the report of the Council on Medical Education be endorsed as a whole. Nothing short of extreme emergency should be permitted to in any way lower the standards which the council had so creditably established. The committee recommended that the council be given authority to proceed to prepare a new classification of medical colleges, and that the new schedule for the grading of medical schools in future classifications be endorsed. Resolutions were introduced and adopted for undertaking a systematic rehabilitation and re-education of crippled soldiers through occupational therapeutics. A resolution urging the necessity for the enlargement of all civilian training schools and necessary propaganda to secure a sufficient number of pupils for these schools was adopted and a committee appointed for that purpose. This resolution had particular reference to training civilians for nursing. A resolution was adopted petitioning the President of the United States, the Secretary of War and the Surgeon General of the navy, and of the Public Health Service to authorize the employment of such unselfish women physicians in the service of the Government in any of the many fields for which they are especially fitted by natural ability and training, and that when so employed adequate work and pay be provided in every way equal to that of men similarly employed.

A resolution urging the early adoption of a pro-

manent national policy of universal military training for all young men before the right of suffrage is granted them was adopted. Another resolution unqualifiedly endorsing the Owen-Dyer Bill not before Congress was adopted and its immediate enactment into a law urged. A resolution was adopted that it would be for the best interests of the nation if General Gorgas could be continued in his present

News Items.

Summer Vacation Labor Permits.—A law has been enacted permitting the employment of children between the ages of fourteen and sixteen years in mercantile establishments or business offices during July and August, provided they obtain a special summer vacation permit from the local board of health.

Teachers of Children's Diseases Hold Annual Meeting.—The annual meeting of the Association of American Teachers of Diseases of Children was held in the Congress Hotel, Chicago, Monday, June 11th, under the presidency of Dr. John Lovett Morse, of Boston.

The General Medical Board of the Council of National Defense.—A meeting of the board was held at the Congress Hotel, Chicago, on Sunday, June 10th, preceding the annual meeting of the American Medical Association, and a meeting of the State and county committees of the medical section of the council was held on the same day.

Free Antityphoid Inoculations.—The United States Public Health Service has been directed to give antityphoid inoculations without charge to all who apply to any of its hospitals or field offices. Application must be made in person. Information as to the nearest place where inoculation can be given will be furnished on application to the Public Health Service, Washington, D. C.

Hospital Conference.—A meeting of the Hospital Conference of the City of New York will be held at the New York Hospital, 8 West Sixteenth Street, on Monday, June 17th, for the purpose of discussing the labor crises and considering the advisability of appealing to the Federal authorities to institute measures of relief. The labor shortage, according to report, is now so serious that many hospitals are being obliged to curtail their work, and some are looking forward to the possibility of being compelled to suspend work entirely.

Country Estates Offered to the Government.—Several wealthy citizens of New York have tendered to the government the use of their country estates for use as hospitals or convalescent homes. Among these are Mr. and Mrs. W. K. Vanderbilt, Sr., who have offered their estate Idle Hour, on Great River, near Oakdale, Long Island; it is estimated that there will be accommodations for 1,500 patients. Mr. Clarence Mackay has offered his country residence, Harbor Hill, near Roslyn, Long Island, for use as a base hospital. Mrs. Katherine Flower King, of South Orange, N. J., will reopen her summer home at Leek Island, Canada, as a hospital for returned soldiers, continuing the service begun last year. The staff will include several physicians and nurses from the Oranges.

The Prevention of Disease in Camps.—A board has been organized by the War Department consisting of the following officers of the Medical Department for the purpose of investigating the nature, causes, prevention, and treatment of pneumonia in the National military camps: Colonel Deane C. Howard, Colonel Frederick F. Russell, Colonel Victor C. Vaughan, Lieutenant Colonel William C. Welch, and Contract Surgeon Rufus Cole. The studies made revealed some unexpected facts. There is a variation in the death rate from 2.3 to 31.5 per thousand, a difference which is not explained by geographical location. The death rate from pneumonia was particularly high among the troops from the South, regardless of whether they came from the cities or from the rural districts.

Women Physicians Demand Control of Hospital.—The Board of Regents of the University of the State of New York has been petitioned by a committee of women physicians who are members of the medical board of the New York Medical College and Hospital for Women to remove from the governing board such men as are now members, and to take such steps as may be necessary to prevent the election of men as members of the board. The committee also charges that the charter has been violated by the adoption of resolutions by the board abolishing the college and clinic of the institution and dismissing the faculty. It is asserted that the hospital earns more than enough to offset the deficit in the revenue of the college, which was given as a reason for the abolition of the college by the members of the board.



ALEXANDER LAMBERT, M.D.,
of New York; Major, M. R. C.; President-elect of the
American Medical Association.

office as Surgeon General of the United States Army after he reached the prescribed age of retirement in October, 1918, and an expression of appreciation and confidence in General Gorgas was communicated to the President of the United States. A resolution calling upon the members to further the conduct of the war by confining their prescribing to products owned and manufactured by loyal citizens of this country or of our Allies was adopted.

ELECTION OF OFFICERS.

At the meeting of the House of Delegates, Thursday afternoon, June 13th, the following officers were elected for 1919: President, Dr. Alexander Lambert, of New York; first vice-president, Dr. William Wishart, of Indianapolis; second vice-president, Dr. E. Starr Judd, of Rochester, Minn.; third vice-president, Dr. Charles W. Richardson, of Washington, D. C.; fourth vice-president, Dr. John M. Baldy, of Philadelphia; secretary, Dr. Alexander R. Craig, of Chicago; treasurer, Dr. William A. Pusey, of Chicago; speaker of the House of Delegates, Dr. Hubert Work, of Pueblo, Colo.; vice-speaker of the House of Delegates, Dr. Dwight H. Murray, of Syracuse, N. Y.; trustees: Dr. Frank Billings, of Chicago; Dr. Wendell C. Phillips, of New York; Dr. Thomas McDavitt, of St. Paul; Dr. E. Chester Brown, of Connecticut. Next year's meeting will be held at Atlantic City, N. J.

Modern Treatment and Preventive Medicine

A Compendium of Therapeutics and Prophylaxis, Original and Adapted

RECENT OBSERVATIONS IN DIGITALIS THERAPY.

BY LOUIS T. DE M. SAJOUS, B. S., M. D.
Philadelphia.

(Continued from page 1092.)

That digitalis may act under abnormal conditions in a manner seemingly different from that in which it exerts its effects on the normal circulatory system was pointed out in preceding issues. Quantitative differences, by virtue of which an amount of the drug smaller than that required to cause changes in the normal circulation suffices to produce benefit in abnormal circulatory states, are accounted for by Sollmann, 1917, in the statement that, whereas in health the results from digitalis action constitute departures from the normal, to which resistance is offered by compensatory mechanisms, in abnormal states, on the contrary, they constitute a return toward the normal and are consequently not resisted.

What are the chief difficulties with which the heart has to contend under abnormal conditions and which digitalis may have the opportunity to overcome? Some of these may be briefly enumerated as follows: Increased cardiac rate, which may be ascribed either to toxic irritation of the organ, to augmented irritability of the heart from excessive functional demand, or to overactivity of the sympathetic cardioaccelerator nervous mechanism. Irregularity of the heart beat, due to disturbances in the production or conduction of the contractile impulse. Actual weakness of the heart muscle itself. A dilated condition of the heart, whether associated or not with actual impairment of the heart muscle, and which may initiate a vicious circle by interfering with proper valve closure. Disturbances of blood pressure, arterial or venous. Poor quality or insufficient amount of the blood supplied to the heart, with corresponding functional weakness. Abnormal viscosity of blood, imposing added labor upon the heart muscle.

Increased rate of the heart, is almost the rule in cardiac disease, independently of the arrhythmias. Toxic states usually cause increase of rate, and, at least in part, a direct irritating influence of the toxic material on the heart may be held responsible. Fever is itself attended by a rise in the heart rate. Apparently a most important factor in changes in the rate is the extent of the demand for cardiac function at the time. As G. W. Norris, 1914, emphasizes, within moderate limits the output of the heart increases and diminishes with corresponding changes in the cardiac rate. From this we may deduce that all conditions which increase the functional demand on the heart tend toward an increase in the rate; and such an increase we do observe clinically. As regards fever, it is of interest to recall the experimental investigations of Newburgh and Lawrence, 1914, indicating that degrees of hyperthermia not exceeding those met with in infections are sufficient to cause a marked lowering of blood pressure.

Norris believes the increased temperature of infection a potent factor in the lowered blood pressure occurring under these conditions. Apart from other influences that may tend to raise the heart rate during fever, we would thus expect increased demands upon the heart during fever in order to make good the diminution in blood pressure. Wolf, 1911, found that the work of the heart is increased during fever if the blood pressure remains constant. Another factor in the rapid pulse of fever is the rise in temperature itself, which has been positively shown experimentally to influence the rate of impulse production in the sinus node or pacemaker of the heart. Toxic tachycardia may also be a result of excessive use of tobacco, alcohol, or coffee.

Nervous disturbances reacting upon the heart rate through stimulation or increased irritability of the sympathetic accelerator nerve supply of this organ constitute a second large group of cases. A reflex tachycardia accompanying disorders of the abdominal or pelvic viscera is well recognized. The tachycardia of soldiers—irritable heart—is by many considered due to a nervous disturbance, though Lewis, 1917, thinks the theory of a toxemia the most tenable. Excessive secretory activity of the thyroid gland is held by Goodall, 1917, and others to account for at least some cases of irritable heart—a view apparently not unreasonable since Musser, Jr., 1918, found no less than ninety-seven cases with signs of hyperthyroidism among 424 recruits exhibiting tachycardia. The influence of the thyroid in increasing sympathetic activity is well known; hence these cases may likewise not irrationally be placed in the nervous group. Some cases of irritable heart are plainly based on a former myocardial involvement, *e. g.*, in pneumonia. The cause of the increased rate frequently noted in myocardial disease and, indeed, in cardiac insufficiency in general is, according to Hewlett, 1916, not as yet clear.

Whatever be the cause of tachycardia in a given case, a feature to be borne in mind is that, as Norris, 1914, states, extreme increase of heart rate impairs cardiac output by curtailing the period of filling of the ventricles and endangers the reserve power of the heart muscle by curtailing its resting period. Digitalis, slowing the heart rate through vagal stimulation and, as generally believed, increasing the total resting period of the heart, thus seems well calculated to yield benefit where tachycardia exists. Clinically, cases with rapid heart rate occur in which digitalis brings success, at least partly by slowing the rate, where rest in bed has failed. Thus, Sutherland, 1917, reports the instance of a girl of eleven years with recent rheumatic cardiac involvement, a rate of 120 to 130 per minute, a normal rhythm, and murmurs indicating mitral and aortic regurgitation. A fortnight's rest in bed failed to benefit, but under digitalis the rate fell to sixty-eight, the dilated heart diminished in size, and the symptoms passed off. That the slowing of the rate *per se* could be an important beneficial factor either by increasing the

output through improved mechanical conditions or by resting the heart is readily conceived; yet such a case does not actually show, as Sutherland seems to infer, that the drug may not be benefiting also in other ways, as by directly exciting and toning up the myocardium. Again, recent observations have served to emphasize the fact that in some cases of increased, but regular, rate digitalis is almost powerless to reduce it, or causes but little subjective improvement. This applies, according to Parkman, 1917, in "soldier's heart." Thus digitalis, in spite of the slowing effect it often produces, is not to be considered a universal remedy for tachycardia. Sutherland asserts that it is especially in hearts affected by rheumatic inflammation that vagal slowing by this drug may be confidently expected.

(To be continued.)

Treatment of Diabetes by the General Practitioner.—N. W. Janney (*Journal A. M. A.*, May 4, 1918) says that in spite of the great advances recently made in the treatment of diabetes the profession at large has failed to profit by them. This failure is due to the severe requirements of clinical experience coordinated smoothly with a practical system of practical diabetic dietetics and accurate chemical laboratory methods. Since, however, the management of most diabetes remains in the hands of the general practitioners and internists an effort has been made to adapt a simplified scheme to fill the general need. The plan is by no means ideal and whenever possible it should be replaced by more specialized methods. The plan is presented in full detail and includes the division of patients into the group of light, uncomplicated cases; and into the severe, chronic cases with complications, such as acidosis, infections, obesity, etc. In both classes hygienic treatment is observed, worry overcome, and exercise in the open prescribed. Both types of patients are also taught to weigh their foods, to use the Joslin food card, and to control their carbohydrate, fat and protein intake according to orders. They are also taught the qualitative Benedict test, which they must perform daily on a twenty-four hour specimen of urine for some time. The light cases select a simplified diet, but one like their usual diet, from the food card and weigh and measure all food taken for a few days. During this time the sugar excretion is carefully determined by quantitative urinalyses. A diet is then prescribed to contain only about half as much carbohydrate as the one normally taken and the patient is encouraged to reduce his general food intake to a point just sufficient to maintain his weight. The patient should thus become sugar free within a week on the new diet. The patient must then be taught to keep himself sugar free, but can be allowed considerable latitude in his selection of foods, continually estimating his intake of each article. In the severe cases, a sudden change in the diet is not desirable at the start, but the diet should be gradually diminished until a fast is instituted, during which plain water, tea or coffee, broth, and small amounts of whisky are permitted. He should not go to bed during this fast, which is continued for not more than four days, or until the urine is sugar free for two days. Then the first of four diabetic diets is

ordered, and if there is no return of sugar each of the others is given in turn. If there is return of sugar after the fast it should be repeated for three days and the diets again started. When the fourth diet is well taken without glycosuria it may be increased very slowly, but reappearance of sugar is the signal for another fast. The maximum diet reached should not be over thirty calories per kilogram of the patient's body weight. If acidosis is present or develops it should be treated by keeping the patient warm in bed and giving him 4,000 mls of fluid by mouth and rectum during the first twenty-four hours. Alkalies are not necessary and are probably harmful. The diet should be fluid. Where possible blood sugar determinations should be made in all patients and the alveolar carbon dioxide tension determined.

Management of Cases of Pregnancy in Lung Tuberculosis.—Joseph Walsh (*American Journal of Obstetrics*, February, 1918) protests strongly against that which he believes to be a grossly exaggerated idea of the unfavorable influence exercised by pregnancy on pulmonary tuberculosis. This idea has been fostered since about 1910 by German and Italian writers, who have advocated production of abortion or induction of labor in every case with tuberculosis, whether acute or chronic. A list of patients extending over fifteen years and comprising thirty-eight cases in various stages of the disease shows thirty-three of these patients still living, in spite of delivery of fifty children after recognition of their tuberculosis. Of twenty-seven cases in which the disease was recognized and treated before pregnancy, twenty-five are still living and apparently as well as before pregnancy, though three have each had three children, and two, six children. One patient died about three months, and another a year, after delivery. Of eleven cases in which the disease was recognized only during pregnancy, one being early, five moderately advanced, and five far advanced cases, three died after pregnancy—all far advanced cases. Of these three, two were seen but a few days before labor, leaving no chance for treatment. Of the remaining eight cases, two far advanced patients are still under treatment, and six came through successfully and are alive at an average interval of two years after labor. The fact is to be borne in mind that a certain number of tuberculous cases die each year apart from pregnancy or other complications and even under the best of treatment. In three cases abortion was induced against advice. All were far advanced cases and showed some exacerbation of the tuberculosis, apparently due to the operation; two of the three died four years after the abortion. Ebeler, a recent German writer, who operated on thirty-one cases, had thirteen per cent. of deaths. Walsh, in his thirty-eight cases, also had thirteen per cent. of deaths, but in addition these patients had fifty children. The author concludes that while active cases of tuberculosis should be advised against marriage, quiescent cases, especially after treatment and education, may be allowed to marry. Quiescent cases becoming pregnant, if put on a rigid régime, may be expected to come through the pregnancy with but little, if any, advance of the tuberculosis.

Radium Treatment of Scars.—Walter C. Stevenson (*Lancet*, March 23, 1918) believes that radium is of distinct value in the treatment of scars and fibrous adhesions, and is of especial value as an adjunct to other methods of treatment by shortening their duration. It rapidly, sometimes immediately, softens and mobilizes scar tissue; it facilitates the later surgical removal of scar tissues when this is required, and enables structures which are adherent to the scars to free themselves. By loosening tendons and joints it improves functional capacity and, at the same time, it acts to a certain extent as a local anesthetic for about a week after its application. Its application is simple and the best results are obtained from the use of a single large dose. It also seems to hasten the healing of wounds and to diminish the painful inhibitory effects of inflammation. The simplest method of application is by means of a number of small tubes of the emanation, fastened by paraffin to the bottom of a small leaden box, covered with two layers of lint or wool and of adhesive plaster to cut off the soft rays. The dose used should be just below that causing epilation or erythema. About 320 to 360 millicurie hours is the average dose.

Abuse of Milk in the Feeding of Children.—J. Comby (*Presse Médicale*, March 18, 1918), aient the existing scarcity of milk, which has given especial annoyance in Paris, takes occasion to emphasize the drawbacks of excessive use of milk in the diet of children over one year of age. To continue in a child of eighteen months or two or three years the diet consisting chiefly or exclusively of milk which is appropriate for babies six or twelve months old is to expose the child to anemia and various digestive disturbances. An infant six to fifteen months old can suitably consume about one litre of milk a day. Later, however, this amount should be considered excessive. Children of eighteen months to three years should not use more than one half litre of milk, the remaining half litre being more than made up in the bread, soups, flour, purées, eggs, etc., taken in addition. Children over three years of age can, if necessary, do without milk just as well as adults. Children fed too exclusively with milk gain weight and flesh, but their tissues are soft, the muscles lax, and locomotion retarded. The mucosæ are pale and a systolic murmur may be heard over the base of the heart and the vessels of the neck. The blood shows but two or three million erythrocytes and the hemoglobin is markedly subnormal. General languor and obstinate constipation are additional manifestations of the lack of iron in the diet. Children who have been given other foods rather early do not show this anemic state, and in the anemic, replacing part or all of the milk by other foods soon causes the anemia to disappear, especially if a few decigrams of protoxalate of iron daily are also administered. In Comby's experience daily ingestion of one to three teaspoonfuls of fresh grape or orange juice has seemed distinctly to favor the return to good general health and to overcome constipation. These recommendations as to the milk in the diet are held only to apply in normal children, and may have to be disregarded in children showing abnormalities of development or suffering from some disease indicating a milk diet.

Prevention of Spread of Epidemic Diseases at Schools.—H. Morley Fletcher (*British Medical Journal*, March 16, 1918) applied the methods of prevention worked out by Gordon for the disinfection of meningococcus carriers to the prevention of the spread of epidemic diseases in schools. Some modifications were introduced. The method included exposure of the children to steam spray of 1½ per cent. solution of zinc sulphate; douching of the nose with 1-4,000 potassium permanganate solution; and gargling with the same solution. Upon the appearance of a case of contagious disease all the exposed children were put through this routine and in no instance did a case of secondary infection develop. Where it was not possible to use the steam spray the douching and gargling were employed alone with excellent results.

Treatment of Seminal Vesiculitis.—I. E. Seward (*Indiana State Medical Journal*, May, 1918) divides the treatment into prophylactic, palliative, and surgical. Under prophylactic, it is best to treat an acute urethritis at once and not wait for the acute symptoms to subside. When the vesicle is involved in an acute inflammation the treatment should be rest—if there is temperature, rest in bed—and the urethral condition should be treated. In the chronic stage, which may be classified as palliative, massage of the vesicle is the best method in selected cases in which there are no pus pockets, no perivesiculitis and no strictures of the ejaculatory duct. If, after a thorough trial, no results are obtained, vasostomy is indicated. Vesiculotomy may have to be performed. Pus, pain, rheumatism, and abnormal sexual symptoms are the cardinal symptoms for which it is done.

Influence of X Rays in Female Pelvic Disease.—John Phillips (*Lancet*, March 23, 1918), recommends the use of x rays in the treatment of the following classes of female disease: Uterine fibroids, metritis or myofibrosis, cervical carcinoma, before, during and after total extirpation of the uterus; certain cases of colitis; for sterilization following Cesarean section and in severe dysmenorrhea and osteomalacia; in certain constitutional hemorrhagic diseases such as hemophilia and purpura hemorrhagica; for absorption of old, chronic thickening, and in leucoplakia, pruritus, and other diseases of the vulva. The precise mechanism of the actions of the rays is not understood, but they seem definitely to cause ovarian atrophy, to promote absorption of fibrous tissues, and to exert a beneficial effect on the uterine muscle, and they probably influence the composition of the blood. It has been urged that the rays be limited to certain classes of fibroids only, but the results seem to indicate that they should be given a trial in every case before deciding upon operation. Their use in the cases of colitis referred to is for their effects upon ovarian activity, which seems to aggravate the colitis markedly in many cases. The advantages of their use are that: The treatment is painless; it is relatively brief, taking not over three months; the menopause, when produced, is usually symptomless; they are cheaper than operations; they can be continued during menstruation, and thus avoid the bad after-effects. Their application should be carried out by an expert under the supervision of the gynecologist.

Hypertrophic Stenosis of the Pylorus in Infancy.

—W. P. McDowell (*Charlotte Medical Journal*, April, 1918) states that mild cases will respond to medical treatment, but most cases require surgical treatment. Medically, careful feeding and stomach washing are employed. Lavage with water at 110°-112°, in which a small amount of sodium bicarbonate or sodium chloride has been dissolved, twice daily. It should flow in slowly and siphon out. Breast milk is the best food, but it may have to be diluted. If it can not be obtained, modified cow's milk should be used. The fat content should be low or the milk should be fat free. If medical treatment has lasted a week or ten days and there is no improvement, surgical treatment should be considered. Gastroenterostomy has been the operation of choice, but the dividing of the hypertrophied muscular bands of the pylorus down to the submucosa has taken its place.

Postoperative Thrombosis and Embolism.

Frederick McCann (*British Medical Journal*, March 9, 1918) analyzes the factors which lead to the development of postoperative thrombosis and its secondary accompaniment of embolism and reaches the conclusion that it is due to injury to the interior of the bloodvessels, probably accompanied by some infection. The condition is most frequent in those operations in which vascular areas are most commonly transfixed for ligation. It is probable that such transfixion in many instances carries a strand of catgut through the lumen of one or more small vessels with resulting damage and infection. By so operating as to avoid all transfixion, by using blunt, round bodied needles for all intraabdominal work, and by securing perfect hemostasis by ligatures tied just tight enough to close the vessels but not so tight as to cut their walls, it has been possible to eliminate almost completely the occurrence of thrombosis.

Vincent's Powder in the Treatment of Wounds.

—Pierre Dezaraulds (*Presse médicale*, March 7, 1918) considers the use of Vincent's powder—a simple mixture of boric acid and chloride of lime—the only antiseptic procedure of permanent value among the various methods of wound treatment now in use. The wound is first freely opened up, all dead or dying tissue excised, and the powder copiously applied, either with Vincent's special powder blower or merely by shaking the bottle containing the powder over the wound. A covering of gauze completes the dressing. An important feature is to apply the powder after the wound has been surgically dealt with. Experience with the powder in over 200 cases showed that it is entirely devoid of general toxic effect and not caustic, though in a recent wound so treated there developed blackish or brownish patches strongly suggesting superficial necrosis. These patches are actually not necrotic, and, upon passing lightly over them cotton dipped in hydrogen peroxide solution, they quickly disappear, baring bright, red living muscle tissue beneath. They are caused simply by the action of the powder on extravasated blood, and fail to reappear at the second or third dressing. The bacterial flora of wounds is more quickly overcome by the powder than by Dakin's solution, no microbial pullulation ever persisting at the expira-

tion of two or three days. The powder is advantageous in permitting with safety a great reduction in the frequency of redressings; a wound of the soft parts was dressed only every five or six days and a case of fracture of the femur by a shell fragment only every seven or eight, without suppuration or discharge. In fractures, the method permits of unusually conservative treatment as regards removal of bone fragments. In emergency periods, the powder permits leaving wounds, where necessary, without especial attention for a considerable period, yet without compromising the ultimate result.

Röntgen Rays and Benzene in Polycythemia.

Samuel H. Hurwitz and Ernest H. Falconer (*Journal A. M. A.*, April 20, 1918) record a case of polycythemia in which an apparently lasting cure was effected by the combined administration of benzene and the use of x rays. They call attention to the fact that neither of these agents alone has proved adequate for the control of this disease and suggest that it may have been the combination which led to the recovery. It seemed possible that the rays were capable of acting in a more destructive manner on the erythropoietic tissues than usual because of the reduction of their resistance by the toxic action of the benzene.

Elephantiasis of the Extremities.

—C. Walther (*Bulletin de l'Académie de médecine*, March 5, 1918) describes a new surgical method of treatment which consists in the introduction of a rubber tube leading from the affected part to a point well within healthy tissues. Numerous experiments and Delbet's clinical experience have shown that rubber tubes are perfectly tolerated by the tissues, and for an indefinite period. In elephantiasis of the lower extremity, Walther makes a short incision about half way down the anterointernal surface of the thigh and another in the abdominal wall. By means of Chassaignac's trocar, and with a relay incision in Scarpa's triangle, a narrow rubber drain, No. 10 or 12, not perforated, is passed in the deep layer of the superficial fascia, against the aponeurosis. At both ends a buttonhole opening is made in the aponeurosis and the corresponding extremity of the tube passed through it and fixed to the margin of the opening with a linen suture. At the upper end a lateral opening is made in the tube to insure evacuation of the superficial lymphatics. In the first case, previously twice subjected to other surgical procedures without success, the circumference of the thigh was reduced by the tube from sixty-four to fifty centimetres in twenty-five days, and the leg at its upper third from sixty-seven to thirty-eight centimetres. Improvement continued thereafter, and twenty months after the operation, a permanent cure seemed to have been attained. In the second case, more recently dealt with, the affected limb was so reduced that it measured only five centimetres more at root of the thigh than the normal limb, one centimetre in the lower part of the thigh, and three centimetres at the leg. In a third case, elephantiasic edema resulted from scarring at the site of an incision on the inner surface of the right arm for extraction of a projectile. Results from the operation were still incomplete at the time of writing, but normal mobility of the part had been almost entirely restored.

Hemothorax in Gunshot Wounds.—Joseph Riley Eastman (*Indianapolis Medical Journal*, March, 1918) gives the symptomatology, differential diagnosis, and treatment of both sterile and septic hemothorax very concisely and clearly. The first step in the treatment of the sterile variety in the field consists of the application of a sterile dressing to the wound, strapping of the chest, and the administration of morphine. The patient should be kept in the recumbent position and propped up on a back rest for comfort. Transport should be delayed until the danger of fresh hemorrhage has passed. Later the principal indication for treatment is for rest in bed. In most cases the hemothorax is slight. It is a good rule to delay aspiration or other surgical operations long enough to permit healing of the wounded vessels, the removal of the blood being apt to dislodge coagula and cause recurrence of hemorrhage. If the accumulation of blood is extensive, so as to embarrass the heart or respiratory movements, aspiration may be performed, a part at a time. Before aspirating, morphine should be administered to control the cough. After the danger of bleeding has passed the patient should be taken out of bed and into fresh air and sunshine. Absorption may be promoted by electric light baths and breathing exercises. Artificial pneumothorax produced by nitrogen injections into the pleural cavity are recommended in obstinate cases to loosen adhesions and promote absorption. The treatment of septic hemothorax consists chiefly of thoracotomy with removal of the infected fluid and subsequent irrigation, bismuth paste injections, and plastic operations.

The Management of Renal Tuberculosis.—H. C. Bugbee (*Surgery, Gynecology, and Obstetrics*, May, 1918) summarizes the present status of renal tuberculosis as follows: Renal tuberculosis may be a primary lesion and arise from a filtration of tubercle bacilli from the blood stream into the parenchyma on tubules of the kidney, where tissue changes similar to those found in tuberculous foci in other parts of the body, take place. An effort is always made to wall off the process but the formation of antibodies is so slow, and the immunity of the patient, which may have been always absent, or which may have been temporarily diminished, is so low that the lesion usually gets beyond control, and usually goes on to wide destruction of the kidney and extension to the other kidney, to other parts of the urinary tract and of the body. From the nature of the lesion remissions are common. The symptoms of renal tuberculosis are misleading, often slight at the onset, and give no indication of the extent of the lesion. The diagnosis of renal tuberculosis may be simple on the most difficult of all urinary lesions, often requiring preliminary treatment to allay acute symptoms and repeated cystoscopic examinations over a long period of time. The treatment cannot be outlined from a study of the symptoms. The remission of symptoms, often for long periods of time, should not be accepted as a cure. The effort on the part of nature to inhibit the progress of the disease and to limit the lesion should be borne in mind, utilized, and encouraged in every possible manner in inoperable cases, as well as before and after operation. While the review

made by Bugbee shows that many others have had cases similar to two quoted by him, where the active tuberculous process has been arrested and walled off, still this is not the rule, the lesion being progressive. Even when arrested, a kidney the site of poorly drained cavities is a menace to the system. Therefore, nephrectomy is the proper treatment. With the means at hand by which we can often make an early and accurate diagnosis of renal tuberculosis, and with our statistics showing that seventy-five per cent. of the cases of unilateral infections are cured by nephrectomy, the tendency is to be too optimistic as to the future in these cases.

Radium Treatment of Lymphosarcoma of the Neck.—Joseph H. Bissell (*International Journal of Surgery*, April, 1918) concludes that lymphosarcomata, because of their wide dissemination, rapid growth, and impossibility of complete removal by the knife locally, are not favorable cases for operation. Radium acts at times on these growths with marked quickness and certainty. Its action depends upon the duration of the growth, its extent, the size of the involvement, and its location, as well as upon the technic of the application itself. Operation is indicated only when the growth can be completely removed together with wide amounts of surrounding tissue. Operation should always be followed by radium treatment.

Treatment of the Amebic Character.—H. L. Watson-Wemyss and T. Bentham (*Lancet*, March 16, 1918) find that the best results are obtained in such cases by a combined method of treatment which consists of the daily administration of sixty-five milligrams (one grain) of emetine by hypodermic for five consecutive days and the simultaneous daily administration orally of 0.18 gram (three grains) of emetine bismuth iodide in salol coated pills for twelve days. One milligram (one sixtieth grain) of strychnine was combined with the injections of emetine to combat the depressant effect of the drug. Diet was found to have no influence on the effects of treatment so long as it was light and readily digestible. By this plan ninety per cent. of the cases were cured with one course of treatment.

Gastric Irritation in the Administration of Quinine.—R. R. Ross (*Practitioner*, March 18, 1918) states that for two years he has been successfully using novarsenobenzol and atoxyl by mouth in amebiasis, the drugs being given in capsules so coated as to pass through the stomach without dissolution by the gastric juice. Similarly, Lebeuf has been giving the double iodide of emetine and bismuth without any trouble from gastric irritation. Recently Ravaut has begun to use 0.5 gram tablets of quinine hydrochloride coated with a protective varnish. Clinically, the results are perfect. The varnish sometimes begins to crack open after tablets have been kept three months. He has also employed with success 0.4 gram tablets of the same salt coated with gluten. Absorption from the intestine is not hindered by these expedients, as the quinine can be detected in the urine two or three hours after their ingestion. Many patients who had previously complained of gastric disturbances and even vomiting after quinine took the tablets without difficulty.

Miscellany from Home and Foreign Journals

Cardiac Complications in Smallpox.—P. Teissier (*Bulletin de l'Académie de médecine*, March 26, 1918) states that, whereas studies of smallpox in the epidemics of 1870 and 1871 led to the conclusion that cardiac complications in the course of variola are very frequent, recent experience on the contrary seems to have indicated that such complications of variola are exceptional, even in particularly severe forms of the disease. As in the case of some other infectious diseases, nonrecognition of the extracardiac murmurs habitually brought about through tachycardia is one of the main reasons for this discrepancy. If, in relation to endocarditis, one does not fail to take into account these murmurs as well as the possibility, in elderly subjects, of previous aortic lesions, and if, in the case of the pericardium, one excludes hemorrhages, which are rather frequent, few or no true endopericardial complications will be encountered. As for myocardial lesions, the author had already shown with Tanon, that, in spite of the disturbances of heart rhythm sometimes met with in severe or malignant variola, the absence of all symptoms of acute cardiac dilatation and of cardiac insufficiency shows that acute myocarditis is likewise only an exceptional complication. Histologic examination, to be sure, always reveals some involvement of the heart muscle, but in most instances the changes are practically confined to vascular lesions—congestive foci with or without interstitial hemorrhages—injuries to the cardiac fibre itself being limited or discrete. The constant absence of suppurative lesions of the myocardium tends to show that the secondary septicemias formerly prevalent in smallpox owing to insufficiency of prophylaxis and active treatment no longer develop.

Cardiac Pathology.—Frederick W. Price (*Lancet*, April 6, 1918) says that auricular flutter is not an uncommon condition clinically, and probably accounts for the great majority of cases of paroxysmal tachycardia with regular rhythm or pulsus alternans. Both the onset and termination of attacks of auricular flutter are sudden, and the duration of the attacks varies in different persons, even in the same individual. The condition may last for only a few minutes, for several hours, or even for weeks or months; and the attacks may recur for years. The attack may be followed by return to normal rhythm or by auricular fibrillation, even in the absence of the administration of digitalis. The etiology of the condition is not known, but its occurrence is most frequent in advanced age and it seems to be associated with myocardial degeneration. The symptoms may come on gradually after the onset of flutter, or may develop rapidly and the patient may or may not be aware of the alteration in the heart's rhythm. There may even be entire absence of subjective symptoms if the ventricular rate remain slow. In the majority the usual symptoms of cardiac failure develop after the condition has existed for some time. When the ventricular rate is very high the amount of blood thrown out is often so small as to be inadequate for the nourishment

of the brain and the symptoms of cerebral anemia may supervene. The arterial pulse rate and rhythm vary widely, depending upon the conduction of impulses through the bundle. It is common to have some form of partial heart block, usually 2:1, 4:1, or 3:1, but complete block is rare. The diagnosis of the condition rests upon instrumental methods largely, the electrocardiogram showing the high auricular rate with the presence of some form of partial block; the same condition often also being well shown by the polygram. The differentiation of the electrocardiograms of flutter from those of fibrillation is best made by the fact that in fibrillation the height of the R waves is irregular and does not correspond with the length of the pause preceding, while this is not so in flutter. Flutter should be differentiated from tachycardia by the fact that in polygraphic tracings of the latter the *a* wave is superimposed upon the *v* wave of the preceding cycle due to the shortening of the interval. Sphygmograms of auricular flutter may resemble those of fibrillation in the presence of an irregularity of the pulse waves with increased rate, but close examination will show that in flutter the waves can be measured out into groups of equal length while such is never the case in fibrillation. Digitalis is well known to affect flutter favorably by increasing the heart block and often by throwing the heart into fibrillation from which it may return to normal rhythm. The drug should always be used, preferably in large doses, until its full effects are secured, after which it may be continued in smaller quantities or stopped altogether for a while.

External and Internal Popliteal Nerves in Sciatic Lesions.—T. E. Hammond (*British Medical Journal*, April 6, 1918) says that, in the South African War, the external popliteal nerve was stated to have been involved nine times as frequently as the internal, and many explanations were sought for this difference. None of these seemed valid. In the present war one series of cases showed the lesions of the external popliteal to be three times as common as those of the internal, while in the author's own series of cases of sciatic injury there were twenty-one with involvement of the external and nineteen of the internal, many having both affected simultaneously, though often to a different degree. The author believes that the two nerves are involved with about equal frequency, but that the involvement of the internal is often not recognized, due to its functions. The functions of this nerve are to supply the plantar flexors of the ankle, the small muscles of the foot, and the skin of the heel and sole. Its paralysis, therefore, does not produce striking symptoms since the action of the paralyzed muscles is normally in the direction of gravity. Very careful examination with the patient prone and the knee flexed to a right angle is required to discover the paralysis. Further, the action of gravity, by keeping the paralyzed muscles relaxed, tends to favor early recovery and to prevent deformity, so that the diagnosis is very likely to be overlooked.

An Autoagglutinin Occurring in a Human Serum.—Milfred C. Clough and Ina M. Richter (*Bulletin of the Johns Hopkins Hospital*, April, 1918) found agglutination in the blood of a patient admitted for bronchopneumonia, associated with chronic mitral endocarditis. An extensive study revealed some interesting observations. Agglutination occurred only at low temperatures, was broken up if heated to body temperature, and could be reproduced by again chilling the same blood. The agglutination was shown to depend on a peculiarity of the serum, and not of the cells. The active substance in the serum resisted heating to 60° C. for one half hour, but was destroyed at 65° C. It was active in a dilution as high as 1:500, and remained active in the icebox for several months. It was not dialyzable, and was not removed by extraction with chloroform. It was precipitated with the "euglobulin" by thirty-six volumes per cent. of saturated ammonium sulphate solution, and was absorbed from the serum during agglutination at low temperatures. Chemical studies failed to reveal anything very definite. The presence of the autoagglutinin was probably of no pathological significance, and not related to the patient's illness, as it persisted over two months' observation, and was also demonstrated in the blood of her daughter.

Rhythmic Variations in Chloride Retention.—P. Valléry-Radot (*Presse médicale*, March 14, 1918) notes that in 1913 Widal and Weissenbach reported a case, deemed by them exceptional, in which, in the presence of nephritis, chloride retention showed an alternate waxing and waning, the elimination of chlorides in the urine presenting a constant variation from day to day. In studies since conducted the author found that this peculiar rhythmicity in chloride retention is by no means rare, but is, in fact, a constant condition both in normal subjects and in nephritics. The system proceeds by regular alternate stages in attaining or attempting to attain its chloride equilibrium. The mildest form of abnormal renal impermeability is that in which, instead of being complete in two days, each cycle, comprising a phase of increase and one of diminution in chloride elimination, occupies three or four days. A worse condition is that in which the alternate waxing and waning is but slight, while in the cases with still more seriously impaired renal functions the oscillations can no longer be discerned. Testing the patient by administration of a known quantity of chlorides after institution of a chloride free diet—*e. g.*, giving ten grams of salt a day after the food has for some days contained only one and one half grams—is the only precise procedure for ascertaining the renal permeability to chlorides; the weight curve may not parallel the actual condition. Many nephritis cases have diminished chloride permeability in the absence of all peripheral or visceral edema. The chloride test must be carried out, not merely for a single day, but for a considerable time if dependable results are to be secured. Carefully interpreted, it permits of detecting a disturbance of renal secretion before any other renal functional test has become positive. Renal disease in cases of high blood pressure was in many instances demonstrated by the author on the basis of this test alone.

End Results of Prostatectomy.—Clarence Martin (*Annals of the New York Academy of Medicine*, May 4, 1918) obtained his data as to the end results of prostatectomy by means of a questionnaire submitted to the family physicians, thus securing unbiased opinions. The replies covered fifty-five cases of suprapubic and a like number of perineal prostatectomies. The healing of the operation wound was prompt in sixty-one per cent. of the suprapubic and forty-two per cent. of the perineal cases; was complete within three months in ninety-four and sixty-six per cent., respectively; and was complete within one year in 100 and eighty-four per cent., respectively. Of the eight perineal cases having a sinus after one year, three developed permanent sinuses. With reference to the influence of the operations upon the frequency of urination, both by day and at night, the results decidedly favored the suprapubic operation; and with respect of the bladder control, the results even more strongly favored the suprapubic route. So far as the occurrence of cystitis was concerned, the results were about the same in the two types of operation, while the perineal seemed to be the most effective in respect to the absence of pain as an end result following the operation. In all other respects, save the relatively unimportant ones of character of the urine and the return of sexual power, the end results strongly favored the suprapubic operation.

Renal Infections.—Harry Culver, Russell D. Herrod and F. M. Philp (*Annals of the New York Academy of Medicine*, May 18, 1918) present the results of a study of 116 cases of nontuberculous, nonsurgical renal infections. Thirty-one per cent. of the patients were male, the remainder female. More than half of the patients had no definite abnormal condition other than the renal infection, while less than half had structural lesions in the genitourinary tract or lesions outside of that tract which might have played a part in the renal infection. But, since about one fourth of those without lesions complained of chronic constipation, and many others had mouth and sinus infections, it seemed probable that these conditions also played somewhat of an etiologic rôle. Contrary to the general belief that all cases of renal infection, except these due to infarction or preexisting lesion, are bilateral, in this series forty-one per cent. were unilateral. The two sides were involved nearly equally in frequency. The symptoms of renal infection were found to be most protean, often being so atypical as to pass unrecognized for long periods of time and to be mistaken for many common diseases. The most constant and prominent symptoms in this series were chills and fever, pain in the back, and frequent painful micturition. However, many patients had none of these symptoms. Symptoms of less frequent occurrence were constipation, headache, vomiting, abdominal pain, general weakness, anorexia, loss of weight, bladder pain, retention of urine, and pain in the neck or back and legs. The pain in the back, so often present, varied from a dull ache in both lumbar regions to decidedly acute diffuse lumbar pain and tenderness. The more acute of these pains were sometimes associated with acute abdominal pain suggesting some abdominal infection. The fever may

maximum height reached and in the duration. The only typical feature of the curve was the fact that it was irregular. About one third of the patients had normal temperatures throughout. There was a leucocytosis varying from 14,000 on the average, to 40,000 in the more acute cases. Leucocytes were almost invariably found in catheterized bladder urine. Cystoscopy showed normal bladder mucosa in a third of the cases; while half of the cases showed some bladder hyperemia about the ureters or trigone; and seventeen per cent. showed marked vesical hyperemia with edema. Cultures of the ureteral urines showed colon bacillus in eighty-five per cent., in pure culture in seventy-four per cent.; staphylococci in nineteen per cent., pure culture in nine per cent.; and one case each infected with typhoid, pyocyanus, a diphtheroid, and a leptothrix. While the diagnosis could often be made from the symptoms and signs, a positive diagnosis was usually possible only after ureteral catheterization.

Cause of Lumbar Puncture Headache.—Russell G. Mackobert (*Journal A. M. A.*, May 11, 1918) calls attention to the fact that there has been no satisfactory explanation of the cause of this troublesome type of headache. The headache occurs only when the patient sits erect, does not last for over a week, is relieved at once by assuming the recumbent position, and does not bear any relation to the amount of cerebrospinal fluid actually withdrawn at the puncture. From a study of the conditions the conclusion is reached that the headache results from continued escape of the spinal fluid through the dural opening into the epidural space, whence it is rapidly absorbed. Puncture of the dense dura leaves a round hole, which is usually successfully plugged upon withdrawal of the needle by the loose arachnoid membrane. In some cases, however, the arachnoid may adhere to the needle and its margins about the needle opening thus be drawn through the opening in the dura making a direct communication between the subdural and epidural spaces. These conditions lead to the escape of the spinal fluid and produce the lumbar puncture headache. The mechanism of the headache from the loss of spinal fluid is explained as being a compression of the thin-walled basilar venous plexus by the weight of the brain which is normally borne by the water bed of fluid at the base of the brain.

Tremor in Malaria.—H. de Brun (*Bulletin de l'Académie de médecine*, March 26, 1918) observed tremor in the majority of cases of malaria in the secondary stage under his care. In the milder instances it is merely a slight vertical tremulation of the fingers, seen best with the arm held up and taking place at a rate of eight or ten oscillations per second. The successive vibrations are of irregular amplitude—a peculiarity especially noticeable in the more intense forms. Generally the tremor is of equal intensity in the two upper extremities. The lower limbs are much less frequently affected, and the trunk and thorax only occasionally. Patients with thoracic tremor are plainly aware of the existing disturbance. Exceptionally the head is caused to oscillate by the tremor of the extremities and trunk; it may even show independent tremor from

side to side. With the patient at rest in recumbency there is little tremor. The trembling is generally brought out to the maximum by intentional movements. The patients do not dare to shave themselves and their writing becomes irregular and even illegible. Physical or mental fatigue or exertion greatly augment the tremor, as do also emotional influences. Rather characteristic are frequent, sudden, and unaccountable variations in the intensity of the tremor, which may change not only from day to day, but on the same day. Generally the tremor becomes worse on the days preceding paroxysms, and improves after the paroxysms have passed off. In two cases sharp tremor of the hands regularly preceded the attacks by three days. In some cases an attack of marked tremor persisting for some weeks, then gradually subsiding to the mild tremor previously present, was noted either as sequel to a febrile paroxysm or ordinary severity or without apparent relationship to any feature of the clinical condition. In the majority of cases the tremor is due to infectious toxemia, but in some, as in a case of nystagmus reported by Jeanselme, it seems to depend upon an organic lesion. Various other disturbances may accompany the tremor in some cases, *e. g.*, muscular cramps, numbness, tingling, reduction of muscular power, etc.

Births, Marriages, and Deaths.

Died.

- ABRAMS.—In Dollar Bay, Mich., on Tuesday, May 21st. Dr. Edward Thomas Abrams, aged fifty-seven years.
ALEXANDER.—In Hiawatha, Kan., on Monday, May 20th. Dr. Benjamin J. Alexander, aged sixty-two years.
BARTLEY.—In Bartlesville, Okla., on Monday, May 20th. Dr. James Finer Bartley, aged fifty-one years.
BUCHANAN.—In North Plainfield, N. J., on Saturday, June 8th. Dr. J. Hervey Buchanan, aged forty-seven years.
EVANS.—In Winchester, Ind., on Thursday, May 16th. Dr. Joseph J. Evans, aged seventy-eight years.
FAIRCHILD.—In Syracuse, N. Y., on Thursday, May 16th. Dr. Merritt Byron Fairchild, aged seventy-nine years.
HALLOCK.—In Rockford, Ill., on Monday, May 20th. Dr. Wallace Eugene Hallock, aged seventy-one years.
HEARD.—In Baltimore, Md., on Tuesday, May 21st. Dr. Joseph E. Heard, aged sixty-five years.
JOYCE.—In France, on Wednesday, May 15th. Lieutenant Whitney Hotaling Joyce, Medical Reserve Corps. U. S. Army, of Unadilla, N. Y., aged twenty-seven years.
LORD.—In Pueblo, Colo., on Wednesday, May 15th. Dr. Herbert Aaron Lord, aged forty-five years.
MCPEETHERS.—In Hardinsburg, Ind., on Saturday, May 11th. Dr. John Snyder McPeethers, aged eighty-one years.
MEEKER.—In Brooklyn, N. Y., on Thursday, May 23rd. Dr. Lewis E. Meeker, aged sixty-seven years.
MERRITT.—In Brooklyn, N. Y., on Sunday, June 9th. Dr. John Merritt, aged seventy-two years.
PENDLETON.—In Kansas City, Kan., on Monday, May 13th. Dr. Edward T. Pendleton, aged forty-four years.
ROLL.—In Hamilton, Ohio, on Thursday, May 16th. Dr. James H. Roll, aged seventy-two years.
RUSSELL.—In Easley, S. C., on Thursday, May 16th. Dr. Hamilton Earle Russell, aged forty-eight years.
STAMM.—In Fremont, Ohio, on Wednesday, May 22nd. Dr. Martin Stamm, aged seventy years.
STOCKTON.—In East Orange, N. J., on Monday, May 27th. Dr. Frank Oakley Stockton, aged sixty-nine years.
THOMPSON.—In Stephens, Ark., on Friday, May 17th. Dr. Charles E. Thompson, aged thirty-seven years.
TREDWAY.—In Pasadena, Cal., on Sunday, May 19th. Lieut. Edward Everett Tredway, Medical Reserve Corps. U. S. Army, aged thirty-nine years.

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Original Communications

SOME UNUSUAL SURGICAL EXPERIENCES.*

BY ALBERT VANDERVEER, M. D.,
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We have all kinds of research laboratories, yet I have sometimes wished there might be an institution for research observation, for my experience has brought me in contact with cases, such as foreign substances in the esophagus, trachea, bronchi, and rectum, requiring immediate treatment, a few of which I would like to tell about. My conclusions in regard to treatment, past and present, may elucidate a little these preliminary remarks.

CASE I.—Master G. C., aged seven, a patient of Doctor Van Alstyne's, while handling his father's lead pencil, loosened the head, and during the act of laughing inhaled that portion. Patient coughed a little at first, but not constantly, and was restless during the night. He was brought to the office the next morning, a distance of some fifty miles, breathing with considerable difficulty. On examination, no respiratory murmur could be heard over right lung, and no marked dullness on percussion. It was believed the foreign substance had lodged in right bronchus, possibly just below bifurcation. He was admitted to the Albany Hospital, anesthetic was carefully given, a rather rapid tracheotomy done, and curved forceps passed down into bronchus with some trouble where some substance could be felt. The first attempt at securing it did not succeed, but the second caught the edge and the tip was removed without any difficulty. Rather violent coughing followed. The anesthetic was withdrawn promptly, and after some escape of mucus into the incision the patient became conscious, was easily calmed, and very earnestly appreciated being told that the pencil tip had been removed. He made a rapid recovery and the trachea healed promptly.

I have great respect for the skilled specialist who can so deftly handle the esophagoscope and bronchoscope, but I am bound to say that these instruments in the hands of an unskilled operator produce more harmful results than follow the clean operation. It is true that this case presented before the use of the x rays. Today, with their use, the location might have been definitely determined, but as we cannot all become experts in the employment of the instruments to which I have referred and as these cases must be attended to promptly, I still believe that tracheotomy is not to be excluded in affording immediate relief and that less traumatism results than from the experimental use of unfamiliar instruments.

I have seen fatal results from the toy mouth balloon, with immediate suffocation, yet withal some

foreign bodies, such as a kernel of corn, a bean, a bit of straw, a clover leaf, peanutshell, or portions of the peanut itself. I have seen some of these substances, particularly a locust pod, expelled as soon as an incision was made in the trachea when a violent fit of coughing took place; and have also noticed the abscesses that would result from foreign bodies one, two, three, or four months after inhalation, in consequence of a large enough bronchus connecting with the cavity in the lung, when with a sudden cough and expectoration of pus, the material would be discovered. I have never operated upon an abscess of this sort from the exterior portion of the chest. Metal substances, like a tack, or possibly, small nail become encysted, as I have observed in many instances, when inhaled, but any substance that will macerate is apt to be expelled in the manner I have described. The most difficult and impossible material to reach is a cork or some such material. It cannot be grasped by any ordinary instrument and I do not think the bronchoscope has demonstrated reports of a sufficient number of successful cases to warrant much comfort, yet I believe it is in these cases such instruments are to prove of great value.

If a child inhales a cork, the probability is that the foreign body will remain permanently between the tricoid cartilage and the bifurcation, moving up and down, thus giving the child a chance to breathe, although lodged at that point. Take this case:

CASE II.—A girl, aged seven years, had inhaled a bean and it was readily located in the respiratory tract. At first she was taken to the Albany Hospital, where I made no effort to remove from above, but did an immediate tracheotomy. The bean was easily located and removed. Several years later when there was no appearance of scar, no constriction, or evidence of any traumatism to be noted as the result of the operative intervention.

Foreign substances taken into the esophagus or the respiratory tract and becoming lodged and partially covered by the mucous membrane may sometimes lead to serious complications suffered from the patient. Here is another case quite recently brought to my respect, and from the case of an esophageal stricture the history will lead to a more correct diagnosis:

CASE III.—Miss E. N., aged seven years, had a black-headed pin about two inches in length. She complained of difficulty in swallowing. The pin was

*Read by title before the Southern Surgical and Gynecological Association, St. Augustine, Fla., December 18, 1917.

sented with such urgency that I was induced to do an esophagotomy at the end of twenty-four hours. This was performed without any difficulty, but I was unable to find the pin at a point where it could be removed, although I could feel it through some thin tissue. I was obliged to admit it was outside of the esophagus and not safe to attempt any further operative intervention. The patient made a good recovery, having a cough that was prolonged for quite a while, but which eventually disappeared. In the spring of 1916, during a severe paroxysm of coughing, Miss N. expectorated quite freely, and noticed in the material what she thought was a bristle, but, upon a more thorough examination was found to be the lost pin. The head had disappeared, and in handling it, thinking it a bristle, she broke off the little point, which was plainly to be observed. Clearly here was an incomplete diagnosis, for, undoubtedly, at the time, she inhaled this into the bronchial tube instead of swallowing it. In examining her neck, there is no evidence of any scar tissue to be observed, she has had thorough use of the neck muscles, and no trouble in swallowing. The bronchoscope would have been of great value in this case.

It has been a wonder to me that animals do not oftener die from a foreign substance lodging in the esophagus, as they eat all kinds of food. My attention was once called to a pet cat which was unable to swallow anything, had grown emaciated, and finally died. An autopsy was made and a piece of fish bone was found in its esophagus, very strong, nearly the size of a nickel, and with sharp edges. The case reminds me of one occurring in the practice of a colleague years ago.

CASE IV.—Mr. B., after eating a meal of roast beef, complained of difficulty in swallowing, and entered the hospital for relief. With the metal probang the doctor could locate a foreign substance in the esophagus. On consultation the use of the umbrella bristle probang was advised, but on doing so a sudden gush of arterial blood presented, and the patient died of acute hemorrhage. Autopsy revealed the arch of the aorta had been punctured by a portion of bone, very much like the fish bone, that had been sliced in the cutting of the beef, and caught in the probang.

Would the esophagoscope have escaped this accident? My observations permit me to report one or more cases of foreign bodies, such as chicken, or other kinds of bone, lodging in the esophagus, becoming buried beneath the mucous membrane, and eluding search when an esophagotomy was done. At the present time this could scarcely occur by the intelligent employment of the esophagoscope. We certainly profit by research operation, and had my case of pin in the bronchus had the benefit of the use of the bronchoscope an esophagotomy could have been avoided.

Foreign bodies in the rectum have always been a source of considerable thought, and just how to remove them promptly at one time gave me some little annoyance. At first they may easily be felt, but not so readily grasped, and I early demonstrated in my own practice that it was safe to dilate the sphincter sufficiently so that a small sized hand could be inserted, the substance being grasped in that way. It is well known that these foreign bodies have a very energetic way of getting up above the sigmoid flexure into the descending colon. I have known of a case in which an inkstand figured, and such odd articles, but in the case I have in mind the foreign body was pushed into the rectum and caught.

CASE V.—The engineer of a train suffered from eczema about the anus, pruritus ani, and was in the habit of securing some relief by rubbing the parts with the end of a

wax candle, such as then used in the passenger cars. On one occasion, while doing this, he suddenly became faint, and sat down on the candle, which immediately disappeared in the rectum. It was a difficult matter to reach this foreign substance, and remove it, but was finally accomplished with some considerable trouble, by dilating the sphincter, when the candle dropped into view.

In my earlier years of practice, when called to far distant places in the country, often inaccessible mountainous regions, when the opposition to moving the patient to the hospital was very great, not infrequently I have been obliged to operate at once, leaving the patient in charge of the family physician, with a line of treatment as practicable as possible for those in attendance.

CASE VI.—On April 22, 1892, I was called to see and to operate upon Mr. S. P. G., aged eighty years, a charming old gentleman, living with his wife and two elderly daughters. He had suffered for more than two years from an irritable bladder with much distress in passing urine. All symptoms were indicative of stone, which was located by means of the Thompson sound. It seemed quite impossible to give him much preliminary treatment, and an immediate operation was demanded. He had an enlarged prostate, and was in rather feeble condition, so that the operation that could be performed the quickest and produce the most satisfactory results commanded my attention. Under ether I did a suprapubic cystotomy, removing a good sized stone, left a No. 12 English rubber catheter in for drainage, and the wound was kept in very good condition through the intelligent care of his family physician and the aid of his daughters. The wound healed moderately, but with little restoration of the flow of urine through the urethra. He made a rather remarkable recovery up to this point. In consultation with the doctor I suggested permanent drainage, keeping it in from above, and had two silver tubes made, which the daughters kept in good condition. By plugging the tube it was soon found that the bladder would hold fully four or more ounces, then evacuating by the use of a small catheter through the tube kept the parts in a very clean state. At times he would pass a distinct stream through these silver tubes. From time to time, however, the bladder was irrigated through the catheter and kept in very good condition. Evidently there was no invasion of the pelvis of either kidney, and the urine remained quite normal. Under this treatment he was made very comfortable and lived five years longer.

Possibly at the present day we would have done a prostatectomy and restored the function of the urethra. I have occasionally used this same form of treatment with other patients who lived at a distance, and could not have a more radical operation. Today most of these patients would come to the hospital for modern, up to date, early treatment.

I will give you a case bearing upon abdominal surgery and injury to both the esophagus and trachea, which came under observation and treatment in my earlier years of practice and illustrates the persistency with which prisoners will attempt suicide. When not successful in a second effort, I have observed that they seldom make a third.

CASE VII.—Mr. E. B., aged thirty-eight years, an inmate of the Albany Penitentiary on a thirty years' sentence for counterfeiting, July 10, 1878, with suicidal intention, made an incision in the abdomen of some length, tried to divide the right carotid, then severed the left brachial artery one or more inches above the elbow. From this last wound the bleeding was very profuse. I cannot call to mind where so desperate an attempt was made and so much accomplished in the intention. The knife used was made from a steel spring used in the shank of a lady's gaiter. The act was committed in his cell at night and he was not discovered until the next morning. The wound in the abdomen was

seven inches long, a little to the left of the umbilicus to the ensiform cartilage, through which protruded the stomach and large and small intestines with omentum, which was gashed in several places. A distinct amount of fecal matter was on the skin, the viscera being further cut after protrusion. The intestines were cold and dry, and had lint from the blanket sticking to them. The patient was moribund. The parts at first were wiped with a dry handkerchief and returned after an hour, immediate attempt causing hiccoughs and severe pain. The wound was then closed with eight interrupted sutures and broad bands of plaster applied around the trunk. Bleeding having ceased, the other wounds were brought together with plaster only; the neck wound was quite superficial. He was kept under the influence of morphine, and after forty-eight hours removed to the prison hospital. At the end of four days the sutures were removed, the wounds having nearly healed by first intention, with about an inch of abdominal wall still open, but healed at the bottom when I saw him, July 27th, through the kindness of Doctor Haskins, the penitentiary surgeon, who then gave me permission to use the history. There was very little pain, and no evidence of peritonitis at any time. Pulse was always below 100; temperature never notably above normal. Morphine was discontinued on the eleventh and the bowels moved voluntarily on the fourteenth day. The wound in the left arm was one and one half inches long over the lower third of the brachial artery, but the vessel was not in sight. When I saw him, a firm, cylindrical mass occupied the place of the brachial artery where wounded, pulsation being felt two inches above. Pulsation ultimately became perfectly plain in left radial, and the patient returned to duty on November 1st.

Some two years later, with two small knives, he made another attempt at suicide, apparently using a knife in each hand, making a deep incision in his neck, cutting across the trachea completely, down through the esophagus, severing the posterior wall, but not injuring any important vessels except the inferior thyroid on the left side, from which he bled profusely. I saw him a very short time after the attempt was made, and a more ghastly wound I have seldom seen. He was breathing out through it, forcing the blood and mucus over his chest. When completing the examination, and ligating the inferior thyroid, the steps of the operation for repair became quite clear. With catgut sutures I brought together the ends of the esophagus and with silver wire the rings of the trachea, then closed the severed parts with layers of catgut and instituted drainage. With kind and patient nursing he made a good recovery. When all was over, and he was about to return to his work in the shop, he said to me very earnestly, "It is not possible for me to die by my own hands, and I shall never make another effort." He always maintained he considered himself innocent. He was a superior workman, had engraved these plates and sold them for a certain sum, but never passed a dollar of the counterfeit money nor was he responsible for offering it to the public. His behavior afterward was so excellent that he was pardoned, and lived a simple, quiet life with his family, ultimately dying of tuberculosis.

At the time the case attracted a good deal of attention, and, later, when aseptic surgery was introduced, I have often thought of this, and other cases, when the surroundings seemed so utterly inconsistent. In Mr. B.'s case death would ordinarily have occurred from hemorrhage, shock, or peritonitis. The completeness of the division of the brachial artery was evident in the amount of hemorrhage, while it is possible, as he was lying on his left side the elbow became flexed, the forearm pressing against the arm and checking the flow. There is a chance for some doubt, the circulation returning rather quickly. The warmth of the weather, and being covered by a blanket, prevented shock from exposure; the protruding abdominal contents perhaps were not soiled, as thought at the time. Since the intestinal wounds were inflicted after protrusion, possibly no fecal matter entered the peritoneal cavity,

and from long exposure all oozing had ceased before return of the parts; the wounds also, probably already being closed by exudation, many conditions on the part of nature favored his recovery, as well as preventing peritonitis.

In doing my abdominal work I have always had a fear regarding the possible breakage of a drainage tube, and was led to make use of the aluminum ones; eventually returning to the former, as they could be sterilized with a greater ease and certainty. There is much anxiety in a hurried operation, when conditions seem to demand it, not only regarding the surroundings of the patient, but, more especially, the serious state they may be in. I have been called late at night to distant points, perhaps operating during the night, or under the constraint of knowing I had only a certain amount of time before catching a train to bring me home within a reasonable period, and the anxiety following some cases, as to their progress afterward, has been a source of much worry. Here is an instance:

CASE VIII.—Mrs. A. C., aged thirty-five years, married, usually in good health, in November, 1907, became very ill with marked symptoms of acute appendicitis. I was telegraphed for in the evening, and on reaching her home late, taking with me an assistant and a trained nurse, found her symptoms very urgent. An immediate operation was demanded, and not having any too much time in consequence of the desire to return on the earliest possible train, the operation was done rapidly. A nasty, gangrenous appendix was found, and a glass drainage tube inserted, the wound properly dressed, and directions given regarding treatment. The patient progressed favorably and drainage lessened, so that, at the end of four days, on hearing from the nurse by telephone, it was thought well to remove the glass tube and insert a smaller one. On removing it the nurse was distressed to note that the end was irregularly broken, and at once telephoned me of the situation and sent me the tube the next day. Naturally I was upset, thinking of the possibility of the glass having done some harm to the bloodvessels, and advised the nurse not to acquaint the husband or any member of the family regarding the matter. The patient made a good recovery, but the fecal fistula weakened the abdominal walls, so that, a few months later, it became necessary to do another operation. In doing this I made a diligent search for any possible pieces of glass, but failed to find any. She convalesced nicely from the second operation and has never had any untoward symptoms.

In thinking this case over I believe the tube was broken at the time the nurse handed it to me, but in my haste to complete the operation, and get my last, the midnight train, I overlooked it. You may imagine the state of anxiety I was in when informed of such a condition, and this case gave me more worry than a week of hard work. Perhaps it may be of interest for me to make the following statement: The husband, a county official, was found to be a defaulter, and while he lived in fine style, the house commodious and well furnished with a splendid library, I never received any remuneration for my visits or the operations. He was convicted, sent to prison, and his ill gotten wealth vanished, his wife being left absolutely penniless.

About 1870, in my early years of practice, and before we were doing abdominal work to any extent, I was called to see a case with Dr. W. H. Bailey, which had been diagnosed as general peritonitis.

CASE IX.—Mrs. P., and about thirty years of age, married, with young children, had been ill some time, and

was greatly distended, abdomen exceedingly tense, and condition desperate. She pleaded so earnestly for relief that I resolved to pass a small trocar in a zone of great resonance, just below the umbilicus, in the median line. The escape of gas was most pronounced; the cannula was left in for some time, and the patient made a complete recovery.

Soon after this, as my consultation work increased, I saw too many of these cases for my own comfort. At that time they were called by many of the physicians idiopathic peritonitis, but they were the eleventh hour consultations, so far as I was concerned. In many instances it was impossible to determine the exact cause of the trouble. These cases have at times haunted me, even up to the present hour, in thinking how little we were then able to do. The use of the aspirator was tried at times, but with no permanent effect. The treatment, strongly recommended by Dr. Alonzo Clark, of giving opium to narcotism was all that was done at the time, aside from the use of enemata, the latter, too often, doing but little good. The contrast between then and now is so great, especially the technic in the performance of an enterostomy, that the middle aged and younger practitioners of today little realize the struggles we met with in our early abdominal work.

28 EAGLE STREET.

THE RELATION BETWEEN LUPUS ERYTHEMATOSUS AND TUBERCULOSIS.*

With a Review of Recent Literature.

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Lupus erythematosus was recognized as an entity in 1828 by Bielt (1), who named the disease "érythème centrifuge"; and in 1845 by Hebra (2), who called it "seborrhea congestiva," while Cazenave (3), in 1851, gave the disease its present name. At that time, the dermatosis was thought to be intimately related to, if not identical with, lupus vulgaris. In 1884 Koch first demonstrated the tuberculous nature of lupus vulgaris and, through that discovery, the essential difference between the two affections at once became manifest. Lupus vulgaris proved to be a "genuine" tuberculosis of the skin, while lupus erythematosus became, and still remains, an unsolved problem.

Even in those early days, however, the great majority of French dermatologists maintained, on the strength of their clinical observations, that lupus erythematosus was a disease of tuberculous origin—a paratuberculosis. Dermatologists of the English, German, and Austrian schools, on the contrary, insisted that the evidence favoring such a view was insufficient. The pendulum has swung to and fro in the past thirty years; today it shows a strong tendency to come to rest on the side of the tuberculous etiology. Those who assume that lupus erythematosus is a tuberculous manifestation base their contentions chiefly on clinical phenomena; but in recent years, this view has been quite substan-

tially fortified by more exacting and more scientifically well grounded discoveries. Gougerot and Laroche (4), Ehrmann and Reines (5), Jadassohn (6), Lewandowsky (7), Bloch and Fuchs (8) and many other investigators have made very important contributions to this field of dermatological research.

In 1911, Friedlander (9), of San Francisco, published a complete review of the subject, presenting the results of investigations of American and foreign authorities. In his conclusions he states that the consensus seems to point to tuberculosis as probably only a predisposing factor, and the disease presumably caused by a blood borne toxin of unknown nature, in view of the fact that the blood-vessels seem to be involved primarily. Freshwater (10), in 1912, published a comprehensive monograph on the same subject, arriving at practically the same conclusions as Friedlander and the majority of investigators. In 1916, a survey of the literature, with especial reference to the chronic form of lupus erythematosus, was published by Mount (11), of Albany, narrating in detail the successful inoculation experiments of Bloch and Fuchs.

Experimental work resulting in negative findings with regard to a tuberculous etiology is so abundantly described in the literature, that to go into details here is unnecessary, though passing reference should be made to the work of Kingsbury (12), who in 1909 employed the conjunctival tuberculin test in six cases of lupus erythematosus, with negative results. The subcutaneous injection of tuberculin has given negative results in hundreds of cases. Many cases of acute and chronic lupus erythematosus coming to autopsy failed to reveal any evidences of tuberculosis in the viscera. Finally, Jadassohn (6), in 1904, expressed the opinion that positive evidence of a tuberculous etiology was still wanting, and Jadassohn's pupil, Lewandowsky (7), in his critical review published in 1912, came to the same conclusion.

Of the several clinical varieties of the disease, the two most common and easily recognized are the discoid, fixed or chronic, and the acute, disseminated or diffused. Most of the investigations have been carried on in connection with the first variety, since it is of far more frequent occurrence. Some dermatologists still believe that the two types of eruption represent two different cutaneous maladies, but I am convinced they are in error. I have observed numerous instances in which patients suffering from the chronic or fixed type of eruption suddenly became victims of the acute disseminated variety of the affection, so that they presented a coincident eruption of both forms.

The symptoms of the disease in its various manifestations are well known. It may not be amiss, however, to recall that the acute disseminated eruption is frequently associated with the most serious constitutional manifestations, such as high fever, arthritis, coma, etc., symptoms of an acute general infection; in some of these cases there is a fatal termination within a relatively short period after the appearance of the acute cutaneous manifestations. In these fatal cases, the most frequent complicating diseases have been pneumonia, nephritis,

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and tuberculosis. Instances with a fatal outcome have been recorded where autopsy failed to reveal evidences of tuberculosis in any part of the body, so that the question of a tuberculous etiology, even in the acute and fatal cases, is by no means definitely settled.

Turning now to the other side of the question and seeing what evidence we have at hand supporting the contentions of those who regard the disease in the light of a tuberculous manifestation, we find the subject is a broad one and should be approached from two sides, the clinical and the biological.

From the clinical point, the evidence in favor of tuberculosis as an etiological factor is abundant. For example, Robbi (13), working in Jadassohn's clinic, reported eighty-seven cases of lupus erythematosus, 51.6 per cent. of which presented evidences of visceral tuberculosis. Of twenty-three other patients, Robbi found that sixteen, nearly seventy per cent., had positive general reactions after injection of tuberculin, subcutaneously. Of nineteen cases, the von Pirquet reaction proved positive in all. Ullman (14) found evidences of tuberculosis in eighty to ninety per cent. of his patients with lupus erythematosus. In twenty-one patients, Sequiera (15) obtained positive conjunctival tuberculin reactions in fourteen cases. Bernhardt (16) reported twenty-seven cases, of which number twenty-four were infected with tuberculosis.

The incidence of lupus erythematosus in patients with tuberculous adenitis, especially of the glands of the neck, is of common occurrence. This fact alone would be of little significance, but for the circumstance that, in a number of cases recorded, the skin disease disappeared spontaneously after surgical removal of the tuberculous lymph nodes. Such instances have been reported by Delbanco (17), Bender (18), Meschtscherski (19), Pospelow (20), Darier (21), and De Beurmann and Laroche (22). In Delbanco's patient there was a recurrence of the lymph node affection two years after the initial operation, together with a coincident reappearance of the lupus erythematosus. Such a striking interrelation can hardly be ignored by the keenest opponent of the tuberculous etiology of the disease. Pernet (23) found a tuberculosis of the retroperitoneal lymph nodes in a case of acute erythematous lupus, and Leslie Roberts (24), in another case, discovered the presence of tuberculous disease of the mesenteric glands.

The strongest clinical evidence, however, in favor of the tuberculous etiology, is seen in the cases of lupus erythematosus which present a coincident eruption of known tuberculous origin, such as the papulonecrotic tuberculides, lichen scrofulosorum, erythema induratum, and scrofuloderma. The association of lupus erythematosus with the superficial sarcoid of Boeck and the deep sarcoid of Darier has been recently noted in a half dozen consecutive instances in New York alone. Isolated examples are recorded by Spitzer (25) and Bornemann (26) of the coexistence of lupus vulgaris and lupus erythematosus, the nature of the lesions having been confirmed by the microscope. Kyrle (27) demonstrated a patient presenting two patches on the face, diagnosed as lupus erythematosus, one of which the

microscope proved to be lupus vulgaris, the other lupus erythematosus. The significance of these clinical phenomena need not be emphasized; they speak for themselves.

Now take the biological aspects. According to Lewandowsky's latest publication (7), no one has yet succeeded in demonstrating the presence of tubercle bacilli in sections of lupus erythematosus. In specimens treated with the antiformin method and stained with Ziehl's and Much's stains, the sediment revealed rod shaped organisms whose identity with tubercle bacilli is not generally accepted—Arndt (28), Hidaka (29), Friedlaender (30), Spiethoff (31). By means of animal inoculation, however, the tuberculous nature of the disease appears to have been definitely demonstrated by the laboratory investigations of Gougerot and Laroche, Ehrmann and Reines, and Bloch and Fuchs. The experiments of the last mentioned authors were especially fruitful. They excised large sections of tissue from patches of lupus erythematosus, the nature of the lesions being first confirmed microscopically to eliminate other forms of cutaneous tuberculosis, and transplanted the material to animals. If after a few months these animals presented no signs of tuberculosis, they were killed, and their lymph nodes were transplanted to a new set of animals; from these a third series was inoculated. In this manner they succeeded in demonstrating the presence of tubercle bacilli in tissue derived from four cases of lupus erythematosus, the diagnosis resting on clinical and histological findings. The possibility that tubercle bacilli might have been deposited in the affected areas of skin by means of the blood stream, was eliminated, at least in one instance, by simultaneous animal inoculations of the patient's blood, with negative results. Despite the fact that many similar experiments proved fruitless, there is no denying, as Lewandowsky remarks, that the evidence adduced from these four positive results, possesses far more weight than that of the experiments resulting negatively.

By means of the subcutaneous injection of tuberculin, the tuberculous nature of lupus erythematosus has been demonstrated in a few instances, notably those published by Jadassohn, Bloch, Spiethoff, Ehrmann and Reines, Mucha (32), Siebert (33), and C. A. Hoffmann (34). In some instances, as in the cases of Wolff-Eisner (35) and of Spiethoff, marked local inflammatory reactions were noted in the lesions, following the tuberculin injections and theunctions of Moro's ointment. Lewandowsky cites these instances as successful demonstrations pointing toward the tuberculous etiology, but emphasizes the fact that these positive findings are exceedingly rare. The great majority of the cases do not react. Still, as he says, it is known that certain diseases of established tuberculous nature, such as Bazin's disease and the papulonecrotic tuberculides, often fail to exhibit reactions after tuberculin injections. The phenomena resulting from the action of tuberculin injection in patients with lupus erythematosus were thoroughly discussed by Ravogli (36), in the paper read before the American Dermatological Association, four years ago. Bloch and Fuchs carried out a series of experiments which

seemed to establish the presence of certain products or derivatives of tubercle bacilli, residing in the tissue of lupus erythematosus, analogous to, or identical with tuberculin. Pieces of tissue, in which the diagnosis of lupus erythematosus was first confirmed microscopically, were excised, and an extract of them was made. This extract was carefully filtered and in part evaporated. Intradermal injections of this filtrate were administered to tuberculous individuals, together with control injections of tuberculin. For these experiments patients were chosen who had on previous occasions manifested strong reactions to tuberculin and who exhibited lesions of undoubted tuberculous origin, such as lupus vulgaris, lichen scrofulosorum, etc. In these patients the extract operated in the same manner as a well diluted tuberculin injection. The sites of the intradermal injections would flare up following the injection of tuberculin, and histological examination revealed them to be papules of tubercloid structure.

Strongly suggestive as these phenomena are in favor of the tuberculous etiology, their significance and their value rapidly shrink when we come to the interpretation of the histological structure of lupus erythematosus. The histology will not fit the disease. In none of its stages does it ever present the histological changes which heretofore have been regarded to be the essential alterations produced in the skin by the tubercle bacillus. If the disease be a form of tuberculosis, we may still be forced to the conclusion that a virus, or a type of pathological reaction of the organism, exists, of which we know nothing. Bloch (37) undertook some experiments with such an idea in mind. He attempted to modify the tubercle bacilli by chemical means and to provoke an artificial eruption of lupus erythematosus with them. His results, thus far, are said to have been suggestive only. They point, however, to a possibility of an exogenous infection through the instrumentality of a modified virus. Future studies dealing with the reaction of the organism against tubercle bacilli might throw more light on this phase of the question. It is possible, as Lewandowsky suggests, that tuberculosis is not the chief factor in the etiology of lupus erythematosus, but that it is an essential contributory agent, the presence of which renders the body receptive to another, as yet undiscovered, etiological factor.

So it would seem that very little actual progress has been made in the determination of the pathogenesis of the disease, and this is evidenced by a paper written by Fordyce and Holder (38), eighteen years ago. With the exception of the more recent bacillary findings and successful inoculation experiments recorded above, Fordyce and Holder, in 1900, enumerated substantially the same points with regard to etiology and pathogenesis as are found recorded in present day literature.

ADDENDUM.

Almost immediately after the presentation of this paper, the writer's attention was called to an article dealing with the same subject, published by Weiss and Singer (39). From their summary and conclusions it will be seen that their opinions are directly opposed to those of Gougerot and Laroche,

Ehrmann and Reines, and Bloch and Fuchs; also the later publications of Lewandowsky:

Twelve cases of lupus erythematosus discoides were examined for tuberculosis. All available diagnostic methods were employed and a conclusion was reached in each case by study of the combined results and not from any single diagnostic procedure. Ten out of twelve showed indubitable evidence of tuberculosis, past or present, and it is believed that the other two are also tuberculous. In only one of our series of cases that were definitely tuberculous was there any likelihood of the presence of a circulating tubercle bacillus toxin. The evidence presented in the past to prove that lupus erythematosus discoides bears a relation to tuberculosis is purely presumptive. Critical analysis of this evidence shows that conclusions drawn from it are based upon erroneous deductions. In our opinion no evidence has been presented as yet that shows a relation between lupus erythematosus discoides and tuberculous infection or tuberculous disease. It has been shown that tuberculosis, past or present, may be demonstrated in practically all cases of lupus erythematosus discoides, and this fact should only be interpreted as further evidence of the ubiquity of tuberculous infection and not as evidence of an etiological relationship between the two diseases.

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24 WEST FIFTY-NINTH STREET.

PROGNOSIS IN PULMONARY TUBERCULOSIS.*

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When a patient is told that he suffers from phthisis he demands, and justly so, that which we call in medical parlance a prognosis—a forecast as to the course of the disease, its duration, the prospects of recovery, and whether he will again be able to engage in profitable occupation. The physician who could answer these questions in all cases would be more useful to his patients than the best of diagnosticians. The first great clinician, Hippocrates, realized this fact over two thousand years ago when he said: "A most excellent thing for the physician is to cultivate prognosis . . . so that men will have confidence and intrust themselves to such a physician." And it is a fact that only a small minority of tuberculous patients, the so called suspects, are interested in diagnosis; all are eager first for a prognosis and then for a cure.

Patients are not interested in the statistical prognosis of tuberculosis, nor in the figures which show that the majority recover. Each one wants to know what are *his* chances of recovery. Astronomy became an exact science only after astronomers could predict the appearance of comets, eclipses, etc., and patients and their friends will bestow on physicians the same confidence which they now accord astronomers when we will be able to forecast the immediate and ultimate outlook in each individual case, and our prediction will be confirmed by subsequent events.

Short cuts to prognosis.—Strong efforts have been made during recent years to discover special prognostic tests by laboratory methods. The first of these was the differentiation between "sputum positive" and "sputum negative" cases. In the former class, it was stated, the prognosis was poorer than in the latter. Statistics substantiate this observation; but in the individual case it is apt to be misleading. Many acute and progressive cases run their course without revealing tubercle bacilli in the sputum. Acute pneumonic phthisis is an extreme, but drastic, illustration. Indeed, it is my habit to give an unfavorable prognosis in cases of active and progressive phthisis showing no tubercle bacilli in the sputum; they are usually very toxic. On the other hand, many patients expectorating sputum reeking with tubercle bacilli, live on and do well for many years. This also shows that the periodical enumeration of the number of tubercle bacilli in the field is of little, if any, prognostic value; it has, in fact, been abandoned.

Many other special tests have been invented or urged as short cuts to prognosis, but have proved of

little or no value: The various methods of applying the cutaneous and subcutaneous tuberculin tests; the diazo and urochromogen reactions of the urine, Arneft's blood picture, etc., are in this category. The same is true of the complement fixation test, which has been recently lauded by some.

The same may be said about classification of the disease into stages. Experience has shown that because a patient has been classified as a "first stage" case he has not necessarily a better chance to recover than one who is placed in the conventional second, or advanced, stage. One with signs of slight lung involvement, an "incipient," but with symptoms of activity, has fewer chances to get well than another with extensive involvement, but troubled by few or no symptoms of activity as revealed by constitutional symptoms.

Similarly the history of the patient gives no reliable diagnostic criteria. Those who have been in excellent health before the onset of the disease, and have capacious and well formed chests, are not necessarily going to fare better than those with flat chests, flabby muscles, and are lean and weak. Compare the course of phthisis in the average college athlete with that in the average inhabitant of the slums, and you will be convinced that the latter stands a better chance to fight the disease than the former.

Patients showing stigmata of present or past extrathoracic tuberculosis are, as a rule, not in greater danger than others. Thus, scars, the remains of glandular, osseous, or articular tuberculosis in earlier years, are no indications that the pulmonary lesion is likely to pursue a stormy course. Rather, the contrary is true. Patients with such scars only rarely develop active pulmonary tuberculosis, and in the few that it does occur, it is of a benign character; the lesion is very mild, as a rule, and shows strong tendencies to cicatrization. An exception, worthy of emphasis, is phthisis developing after surgical operations on tuberculous bones, joints, and glands; it is apt to be of the acute miliary type and carry off the patient within a few weeks. This is one of the main reasons for conservatism in the treatment of extrathoracic tuberculosis.

Recent investigation has shown conclusively that most of the phthisical conditions in the adult results from infection acquired during childhood which has remained dormant for many years, reactivating when, for some reason, resistance breaks down. The substandard individual with the "phthisical" chest has been weakly and of poor physique and with a flat chest as a result of early tuberculous infection. The fact that he survived shows that the forces working for immunity have been active, and are likely to remain so for some time. On the other hand, the vigorous individual may not have been massively infected during childhood, and when phthisis breaks out it finds virgin soil and is apt to run a severe clinical course.

Physical examination of the chest.—Physicians disagree as to the value of physical examination of the chest, as well as radiography, gives excellent and reliable diagnostic criteria as to the extent of the lesion in the lung, but no prognosis should be formulated relying solely on these diagnostic facts. The numerous patients who tell us that many authoritative

*Read before the Harlem Medical Association, March 6, 1918.

doctors have found large cavities in their lungs, and uttered unfavorable prognoses, which subsequent events showed were not justified, attest to the fallacy of arriving at a prognosis by the evaluation of the physical findings alone. The large number of patients discharged from sanatoriums as far advanced, and hopeless, yet keep on living in comparative comfort, often longer than those discharged with slight "arrested" lesions, point in the same direction.

In many patients with good resistance the extent of the lesion has little influence on the immediate or ultimate outlook. We see patients daily with extensive involvement of more than one lobe, with large excavations, who do well; while others, in whom the lesions are rather limited, or so small in extent as to be difficult of discernment, steadily going down hill. In fact, it is my rule at the onset of active phthisis to give an unfavorable prognosis in cases in which the lesion cannot be made out distinctly by physical diagnosis and radiography. In other words, the less clear cut and distinct the localization of the lung lesion, the worse the outlook. Acute miliary tuberculosis may not reveal any distinct physical signs of a local lesion by the usual diagnostic methods; in acute progressive phthisis it is often difficult to localize the affected area. On the other hand, physical exploration of the chest and radiography reveal the lesion in practically all the favorable cases of chronic phthisis.

In advanced cases it appears that left-sided lesions are more dangerous than those in the right lung. I have noted this fact in most cases which have come under my observation. The reasons are probably because the left lung is smaller than the right and has but two lobes. The division of the lung into lobes retards the spread of the tuberculous process—the interlobar fissures, lined with double layers of serous membrane, act as barriers. In the right lung with three lobes there are two fissures, while there is only one in the left lung, and when this is passed, the entire lung is invaded. In addition, in extensive left-sided lesions, the diaphragm is drawn upward and with it the stomach, while the heart is pulled over to the left and upward; in some cases the apex beat may be found in the third interspace in the axillary line. The result is almost invariably disturbances in the circulation due to mechanical causes; the dyspnea is severe; more so than in dextrocardia found in right-sided lesions. Gastric symptoms, due to the displacement of the stomach, are also very frequent in extensive lesions of the left lung. While I have seen many cases with cavities in the right lung and dextrocardia recover, I have seen but few with large excavations in the left lung do well. They may last for a long time, but they are always unable to do anything because of severe dyspnea, cyanosis, etc.

When signs of cavity formation reveal themselves soon after the onset of active symptoms, the prognosis is bad. The prognosis varies inversely with the time it takes for the formation of cavities. Those appearing slowly have a better outlook than those forming rapidly; the latter have, as a rule, no lining membrane, and are likely to invade the adjoining lung tissue. Cavities in the upper lobes portend less danger than those in the lower ones. The lat-

ter are terminal phenomena in phthisis, and when occurring in the usual case, which is extremely rare, the prognosis is poor, because they do not drain as well as cavities in the upper lobes.

Constitutional symptoms as guides in prognosis.—It is clear then that an evaluation of the anatomical changes in the lungs, as determined by physical exploration of the chest and radiography, does not yield reliable data for a prognosis in phthisis. We are on safer ground when we look for hints in our aims at prognosis by a consideration of constitutional symptoms, which every careful physician is competent to do. This gives an estimate of the reaction of the host to the invading noxious micro-organism.

Experience has taught that the prognosis in phthisis is good as long as the pulse is normal, and, conversely, the outlook is very serious when the pulse rate is persistently high, especially when the tachycardia is not improved by rest. With a pulse rate of one hundred or more per minute, not declining in rapidity after one or two months' rest, the patient is doomed as regards his efficiency as a member of society; he may not succumb soon, in fact he may last for many months or even years, but his chances of recovery are very slim. On the other hand, with a pulse rate of less than eighty the patient has excellent chances to get well. Even if the lesion does not cicatrize, he may keep on living in more or less comfort for many years; he may even be active more or less at his vocation.

A considerable proportion of patients, pronounced cured after a tedious and costly régime, remain with unstable pulse, it will be about normal as long as the patient rests, but exertion, excitement, grief or worry, will promptly increase its rate. Here again the outlook is poor. This class of patient hardly ever recovers to an extent as to be fit for self-support. Similarly paroxysmal tachycardia in phthisical subjects is not of good augury; each attack lasts a few minutes or hours, but one finally proves fatal.

Phthisis is characterized by a low blood pressure. The lower the blood pressure, the worse the outlook. When tuberculosis occurs in a patient with a high blood pressure, and the arterial tension remains unaffected by the phthisical process, the prognosis is excellent. It is for this reason that patients suffering from chronic Bright's disease, especially of the sclerotic type, gout, chronic rheumatism, etc., last very long, and may be active at their occupations, despite the fact that we discern distinct pulmonary lesions, and they expectorate tubercle bacilli for many years.

Tuberculous patients with normal temperature have excellent chances to recover if exertion does not raise it very high; the prognosis is still favorable, provided proper treatment is carried out. On the other hand, fever, 101° F. or higher, persisting for months, is an indication of persistent activity of the pathological process in the lung, and the prognosis is serious. Very few phthisical patients with a continuous temperature of over 103° F., lasting for more than a month, recover. A temporary improvement may be attained by prolonged rest, but this usually proves deceptive. The same is true of hectic, or intermittent fever, with normal or sub-

normal temperature in the morning, but rising to 103° or 105° F. in the afternoon. I have never seen a patient recover after this has lasted for more than a month. Several cases of this type have, however, been saved by the induction of pneumothorax. In patients with advanced fibroid phthisis, with large, "dry" cavities, we often find persistent subnormal temperature. This gives a poor prognosis as regards complete recovery. They never regain efficiency for any kind of work, but may last for many years as invalids.

On the whole, do not give a prognosis in a case of phthisis unless you have a reliable record of the pulse and temperature of the patient extending for at least two weeks.

Of other constitutional symptoms of value in prognosis, the cough and the gastrointestinal functions are to be mentioned. The laryngeal cough, showing implication of the larynx, is of serious prognosis; paroxysmal and unproductive cough also gives a poor outlook. The emetic cough, the patient vomiting after a fit of coughing, is another symptom which spells danger. If it cannot be controlled within a few weeks, the outlook is not bright.

Patients with good appetite, despite fever, will do well, and conversely, those with persistent anorexia, even when the temperature is low, are almost invariably going down hill. Constipation is not dangerous; it can be controlled by dietetics, or medication; but persistent diarrhea, especially when due to tuberculous ulceration of the intestine, or amyloid disease of the abdominal viscera, is an ill omen. When due to dietetic errors, as an excessive milk, or raw egg diet, diarrhea may be controlled and the prognosis is to be formulated on other symptoms.

Patients, and many physicians as well, are apt to be frightened to an unwarranted extent by blood spitting. They will regard with equanimity tachycardia, high continuous or hectic fever, diarrhea, laryngeal implication, etc., but as soon as hemoptysis makes its appearance they are terrified, a terror which has no basis; hardly two per cent. of patients who bleed succumb to this accident. At the Montefiore Hospital we have less than two per cent. of deaths due to hemorrhage. Moreover, in initial hemoptysis, in cases in which the bleeding is the first symptom of the disease, the patient invariably survives the accident. I have never seen fatal hemoptysis in a really incipient case.

In initial hemoptysis, irrespective of the copiousness and duration of the bleeding and its repetition, the immediate outlook is good, the ultimate outlook is best determined by the thermometer. Those with normal or but slightly elevated temperature have a good prognosis, while fever indicates a guarded one. They will survive the bleeding, but will have to cope with an active tuberculous lesion which should be judged by other criteria. It is noteworthy that many phthisical patients feel much better after a hemorrhage than before. The anemia is soon dissipated, because in nearly all primary anemias the hematopoietic organs are stimulated to renewed activity; the appetite improves, strength is regained and the patient recovers within a moderately short time. Hemorrhage during the advanced, cavity

stages of phthisis is more dangerous. The emaciated and weak may not be able to expel blood effused in their bronchi and are practically drowned in it. When large doses of morphine are administered, the prognosis is aggravated for obvious reasons. In some, a large branch of the pulmonary artery, eroded by the tuberculous process, is the source of bleeding, and they succumb within a few minutes. Such acute, brisk hemorrhages occur usually in patients with large cavities. I have seen them in patients who had been doing well, and were told the disease had been arrested when, like a thunderbolt out of a clear sky, the hemorrhage occurred and promptly caused death; at times so rapidly that there was no time to summon aid. We may meet these hemorrhages in acute, and progressive cases, but in this class, the prognosis is hopeless at all events. There is no foundation for the fear entertained that tuberculous bronchopneumonia may follow hemoptysis. It is only observed in patients who have had acute progressive lesions before the bleeding occurred.

Prognostic significance of preexisting diseases.—It has already been mentioned that signs of preexisting tuberculosis, especially during childhood, are indications of good resistance, otherwise the tuberculous process would have carried off the patient during the first attack. It has also been observed that tuberculosis developing in persons suffering from diseases of the cardiovascular and renal systems is only rarely progressive. Phthisis is exceedingly rare in patients with valvular heart disease, especially mitral stenosis, and when it does occur, the tuberculous process pursues a mild course and prognosis is very good. This has been ascribed to the mechanical impediment of the lesser circulation which creates plethora of the pulmonary vessels. But when tuberculosis occurs in a patient with pulmonary stenosis, the prognosis is very poor.

Phthisis in those with high blood pressure due to any cause has an excellent prognosis. It is for this reason, perhaps, that atherosclerosis is another cause which augurs well. Likewise, phthisis occurring in patients affected with chronic rheumatism, gout, nephritis, etc., is very mild and tends to cicatrization. These diseases are characterized by sclerosis of various organs including the lung, and sclerosis is nature's way of healing tuberculous lesions. Syphilis, when occurring in a consumptive, is apt to aggravate the prognosis of both diseases, but when tuberculosis develops in a person who has had syphilis for many years, the prognosis is very good. Here again the tendency to sclerosis comes in in good stead.

Preexisting pathological processes of the nasopharynx, when of mild or moderate severity, do not influence the prognosis, unless rhinologists become active with local and operative treatment. Conservatism in these matters may save the patient from an acute exacerbation of the tuberculous process. Bronchial asthma, chronic bronchitis and pulmonary emphysema preceding the onset of phthisis indicate that the tuberculous process is likely to pursue a mild course.

Constitutional status.—Of immense importance in prognosis is the presence or

absence of complications. It seems that very few phthisical patients die from the original disease, and that most succumb to some complicating tuberculous or nontuberculous pathological process. Among the most important complications which have great bearings on the problems of prognosis are the following.

Pleurisy.—When preceding the onset of active phthisis, pleurisy is to be considered favorable. Dry pleurisy usually results in adhesions of the two sheets of the pleura, which inhibit the motion of the affected lung, thus favoring healing of the lesion in the parenchyma. An effusion completely immobilizes the affected lung. The prognosis is good as long as we do not meddle by tapping the fluid. I have seen many cases of tuberculous pleurisy in which the lesion in the parenchyma was dormant till the fluid was aspirated, when an acute exacerbation of the process followed. Pulmonary tuberculosis beginning with pleurisy, dry or with effusion, has a better prognosis than when it begins in other ways.

Empyema with complications is of grave prognostic significance; recovery is rare, most patients succumbing to exhaustion, amyloidosis, etc. Operative interference is unsatisfactory, and only tapping should be practised.

Pneumothorax, when occurring during the course of phthisis spells grave danger. The vast majority succumb within two weeks. In some the acute symptoms subside within a few days, but hydro-pneumothorax, pyopneumothorax, etc., appear and very few patients survive. In rare cases the pneumothorax proves to be "providential," and promotes healing the process in the lung, like artificial pneumothorax, induced for therapeutic purposes.

Laryngeal tuberculosis is another complication of serious prognostic significance. Though now and then we meet with cases which recover, still, in my experience this is exceptional. Most succumb sooner or later to dysphagia, extreme emaciation, etc. Operative interference, as a rule, aggravates the prognosis.

Physiological processes influencing the prognosis of phthisis are to be mentioned: Amenorrhœa in a tuberculous woman, persisting for many months, is of serious prognostic significance. Unless the catamenial function is reestablished, the outlook is bad. Pregnancy may prove deceptive. During the period of gestation there may be noted an amelioration in the symptoms. In fact, I have never seen a pregnant woman die from tuberculosis. But soon after childbirth we often find that the tuberculous process in the lung breaks out afresh, and may carry off the patient in a short time. The deleterious effects of pregnancy, labor, and lactation have also been observed in tuberculous cases.

Influence of the various methods of treatment on prognosis.—We are constantly reminded that the prognosis in tuberculosis depends greatly on early diagnosis and that when treatment is delayed for any reason, the patient may be lost. This may be true of a very small proportion of cases, but in the vast majority it may be stated that promptitude in the diagnosis and application of treatment have little or no influence on the prognosis. The acute

and subacute cases pursue their course irrespective of treatment, and, as long as we have no specific, this will in all probabilities remain the fact. In chronic cases, which constitute the bulk of our patients, a short delay in diagnosis and application of treatment has no influence generally on the ultimate prognosis as a rule.

The various methods of rational treatment in vogue at present have little influence on the prognosis of the individual case. It has been shown statistically that nearly all methods of treatment give the same number of "recovered," "improved," "unimproved," and dead. This fact can be easily verified by consulting the statistical reports of nearly all climatic resorts, sanatoriums, and the host of new medications, etc., which have been urged as bettering the prognosis in or curing tuberculosis. In the individual case we often feel that a certain therapeutic procedure has helped along toward recovery, but on investigation it is found that along with the special mode of treatment there have also been applied the usual dietetic and hygienic measures which might have been beneficial without any other treatment. In some active and progressive cases, which formerly were lost, as a rule, we may now improve the chances of recovery by the induction of a pneumothorax. But the number suitable for this mode of treatment is very limited.

Résumé.—No single sign or symptom of phthisis is of prognostic value when considered alone, for all special tests have proved fallacious when applied in the individual case. A prognosis in phthisis can only be made by a careful analysis of the constitutional symptoms, and correlating them with the signs obtained by physical exploration of the chest and radiography. Of the symptoms having a prognostic significance, the pulse is the most important. A patient with a slow pulse has a very good outlook; one with a persistently rapid pulse is in a serious condition. Even when the physical signs show but a slight, or even a healed, lesion the prognosis is poor as long as there is permanent tachycardia, or an acceleration of the pulse rate on moderate exertion. Afebrile cases with slow pulse have the best outlook. Those with moderate elevation of temperature, which declines after rest for a few weeks, may improve. But patients with high, continuous, or hectic fever, uninfluenced by rest, have but few chances to recover. Subnormal temperature is sign of a good outlook as regards duration of life, but as regards regaining of efficiency, the chances are poor.

Persistent anorexia, and diarrhea due to tuberculosis, ulceration of the intestine, or amyloidosis, are of bad augur.

Hemoptysis, irrespective of its severity or duration, when occurring at the onset of the disease, has no influence on the prognosis.

The prognosis is better in uncomplicated cases of phthisis than in those with tuberculous or nontuberculous complications. Pleurisy at the onset of the disease is of good augury; when occurring during the course of the disease, a pleural effusion may improve the prognosis, provided it is not tapped. Empyema, pneumothorax, pyopneumothorax, and

laryngeal tuberculosis are grave complications. The prognosis is good in cases of phthisis occurring in patients with the following diseases: left sided cardiac lesions, gout, chronic rheumatism, atherosclerosis, chronic nephritis, bronchial asthma, pulmonary emphysema, chronic bronchitis, and tertiary syphilis. The last mentioned when occurring primarily in a phthisical patient aggravates the prognosis; both diseases are apt to run a vicious course.

Scars indicating osseous, articular, or glandular tuberculosis during childhood, when found in a phthisical patient, are favorable signs.

57 EAST NINETY-THIRD STREET.

DIAGNOSIS AND TREATMENT OF ANTHRAX.*

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In connection with an investigation of anthrax for the New York State Industrial Commission, I undertook to obtain data with regard to diagnosis and treatment. In doing this I had the privilege of interviewing most of the physicians in the State who had treated anthrax, and I have seen the various methods of treatment in the different parts of the State. It was very interesting to have attended the clinic of Dr. D. G. Dudley, at Endicott, N. Y. In fact, it was due to having seen his improved method of treatment which led me to believe that it was essentially important to make research into the matter.

In the past year the number of anthrax cases in New York State has increased to a considerable extent. Possibly the war conditions may have been to a certain degree a causative factor. I make this statement on the theory that the scarcity of labor, with an increased demand of supplies, has had a direct influence in producing a measure of diminished precaution in the process of disinfection of skins, bristles, hair, and wool, which may be due to haste in production. However the theory that in the past year anthrax was more readily recognized and reported should not be overlooked. It was very likely due to the increased activities of medical publications and health officials. There is no doubt that both causes tended to add to the increased number of anthrax cases reported in New York State.

Improvement is noticed in the tannery centres of New York State. Better facilities for early diagnosis and proper treatment have been instituted with gratifying results. Compare the mortality of seventeen per cent. up State with the appalling sixty-eight per cent. of the Greater City. New York City, unfortunately, is lagging behind—the physicians themselves seldom make the diagnosis of anthrax—the patient more often doing this for them. The average practitioner, as a rule, is uninformed about the diagnostic features and the treatment of this dangerous disease. The physician may treat a case for an infected neck, incising the wound and draining, when suddenly a convulsion sets in, the patient is sent to the hospital and there anthrax is

made only at autopsy.

Now, early diagnosis and prompt treatment often mean saving the patient's life. To accomplish this, I would suggest an anthrax diagnosis clinic. All physicians should be informed that there is such a clinic where they could refer cases. The very fact that such is established will put the physician on his guard and more anthrax cases will be reported and fewer deaths occur.

I have made a study of thirty-eight cases in the State of New York, from the standpoint of diagnosis and treatment, and the location of the primary pustule was as follows: one on jaw, two on nose, three on chin, two on lips—one in lower, one on upper—one on temple, one on ear, thirteen on other parts of face, eighteen on neck, five on arm, three on forearm, one on wrist, three on hand, two on fingers, three on chest, one on abdomen, two on sacrum; six cases did not mention site.

I shall now give you enough cases to illustrate the difference in the procedure in the tannery centres and that of New York City. Please note particularly the delay in treatment in New York City.

CASE I.—A tanner, thirty-five years old, male, tanner at Endicott, N. Y., noticed a small, hard, red, itchy papule on his neck over right sternomastoid muscle. The papule did not itch. This papule was getting large and his boss noticed it on the 21st. His boss became suspicious and called a doctor. The doctor called a taxi and drove him to St. Vincent's Hospital. There they did nothing for the patient but told him to go the next morning to Bellevue Hospital (note delay in treatment). Next morning (May 2nd) the patient went to Bellevue, and here a cultural examination was made with a positive diagnosis. Fifty c.c. of Eichhorn's serum was immediately administered and a marked reaction developed with an increase of temperature. Excision operation was performed at 11.30 a. m. The point of incision was close to pustule and no application of phenol, alcohol, or iodine was made. Extensive incisions into surrounding edematous area were also made. The patient was suffering after the operation with nausea, vomiting, bloody diarrhea, pain and swelling of neck and chest and right side. Anthrax bacilli were found in the blood circulation and in the smear made from the pustule. The patient died at 12 o'clock the same night.

CASE II.—C., thirty-five years old, male, tanner at Endicott. On April 30, 1917, a fellow workman noticed a small papule on his neck over right sternomastoid muscle; no history of scratching. Called on the physician of the plant in the afternoon of same day. Diagnosis of anthrax was made and confirmed by the microscope. The pustule was small, papular, yellow and hard; had a fibrinous consistency. Serum exuded when probed. The area surrounding the papule was edematous to a distance of about one inch. The pustule was hard, infiltrated, and reddish, was not tender, and had no pain, itch or burn. Wide excision operation was performed by Dr. D. G. Dudley with the application of phenol, alcohol and tincture of iodine. Thirty c.c. of Eichhorn's serum was administered twice within six hours of each other on the same day. Patient recovered.

CASE III.—M., New York city, fifty-four years old male, hide handler on boats. He says that on May 23, 1917, he was scratched on the neck by a horse hide and on the following day noticed a papule on his neck, right side, over sternomastoid muscle, close to angle of jaw. He went for treatment to Lebanon Hospital on the 24th. The next day (May 25th) a cultural examination was made and a positive diagnosis was made. On May 26th, a wide excision operation was performed, incision was close to pustule, no germicidal applications were made. Fifty c.c. of Eichhorn's serum was administered twice within six hours of each other on the same day. Patient recovered.

*Read before the College Medical Society of the University and Bellevue Hospital Medical College, New York, January 18, 1918.

CASE IV.—O. Endicott, tanner, male, thirty-nine years old. On May 4th he noticed a pimple on his neck a little above and to the right of the larynx. The next day the pimple became larger and much elevated and he reported to the plant physician; a diagnosis of anthrax was made. The pustule was the size of a dime; had a black depressed centre; was a hard, infiltrated nodule with red areola surrounding the postule and also a marked edema. Wide excision operation, as described in Case II, was performed by Doctor Dudley. The patient recovered.

CASE V.—C. Endicott, tanner, male, thirty-one years old. Pimple started on April 6, 1917, and commenced to itch in a few hours and more so the next day, when he notified the foreman, who promptly sent him to the plant physician. Diagnosis of anthrax was made and confirmed microscopically. Wide excision operation as described in Case II was performed by Doctor Dudley, and the patient made an uneventful recovery.

CASE VI.—A. T. male, Brooklyn, hide handler on boats. Pustule was on left neck and swollen. Pustules were also located near large one. There was deep brawny edema on the whole anterior aspect of neck and a scarlet coloration over anterior of chest. Came in ambulance to Long Island College Hospital February 10th, 1917, at 1.30 p. m., and died 9.30 p. m. the same day. He received no treatment; it was probably too late for radical treatment at hospital and it could not be ascertained as to how he was treated prior to his admission to hospital. The hospital reports show that the heart was rapid at precordia, pulse was unobtainable; smear from pustule showed many bacilli resembling anthrax bacilli.

CASE VII.—W. G., Pleasantville, gardener, male, noticed a small pimple on left side of face which was exceedingly itchy. The following day he noticed another pimple beneath the ear. The first pimple was noticed while shaving. The next day, on the 24th, he noticed a slight swelling and pain; on the 25th, the swelling increased and extended and the pain likewise increased to the extent that he could not sleep. He worked until the 25th, when he came to New York from Pleasantville and was admitted to Bellevue Hospital. "Physical examination: Large frame, well nourished, tongue coated, teeth fairly well kept, large swelling of left side of face, slightly pitting and now painful. Pitting extends as a reddish edema to both sides of neck and upper half of chest on both sides. About two inches from chin and on the left side of neck two inches below tip of ear are two pustules which are about one half inch in diameter. The centre of pustules are dark red in color (leather color) and are covered with a small black crust. The one near the chin is surrounded by a vesicular zone about two inches in width; the surrounding tissues are firm to the touch. The posterior pustule situated near the ear on the neck is somewhat larger and it exudes a clear fluid in fair amount."—Bellevue Hospital Record. Blood examination on the 26th: white cells 32,000; polys, 847; mononuclear sixteen per cent. On the 25th he was given ten c.c. of Eichhorn's serum, antianthrax (the precipitated product); this was repeated every twelve hours for three doses. On the 27th he was given forty c.c. of the nonprecipitated antianthrax serum. The patient died on the 27th. Horse manure, used for fertilizing on the grounds where the patient was employed, and also the shaving brush used by the patient, were examined by Doctor Norris, of Bellevue Hospital, but no anthrax bacilli could be isolated from them.

CASE VIII.—G., Brooklyn, male, dry goods clerk. Patient bought a new brush May 29, 1917, and shaved himself. A furuncle developed on the right cheek Thursday the 31st. It became swollen and he called a physician, who applied hot applications without any relief. A second physician was called and he sent the patient to the Jewish Hospital, Brooklyn. Here, wide excision operation was performed with phenol injection and application. Eichhorn's antianthrax serum was also given. The patient recovered. The brush was examined by the bacteriologist of the City Health Department, but no anthrax bacilli could be isolated from it.

CASE IX.—S., male, fifty years old, worked in Endicott tannery. On June 25, 1917, patient noticed a furuncle on left neck. The same day he shaved and cut off the furuncle. The lesion became enlarged to one-third inch diameter, and he reported to the plant physician the next day. On examination the pustule was elevated, brown-

leather color, centre somewhat depressed, and but slightly crusted; one could raise the pustule from the subcutaneous fascial and it felt like a hard nodular infiltrated mass (button like). Tissue, surrounding was somewhat edematous, and very slightly reddish. The patient had no fever and the pulse was not affected. Diagnosis was made and confirmed microscopically. Doctor Dudley performed the usual operation, without injecting any serum. Patient recovered.

CASE X.—P., Gloversville, eighteen years old. Lesion was on the neck. Was treated by Doctor Ellithorp who made wide excision and injected autogenous vaccine subcutaneously. Patient recovered.

CASE XI.—M., New York city, thirty-five years old, clothing operator. He noticed a stiff neck Sunday morning, September 5, 1917. The next day he noticed a furuncle under the chin and there was a swelling which extended to right cervical glands. Two physicians were called in and they painted the lesion with iodine. The next day a third physician was called and he sent the patient to Mt. Sinai Hospital. The patient was operated on and according to the house surgeon, the incision was made one inch around the pustule and the wound was covered with powdered mercury bichloride. Fifty c.c. of antianthrax Eichhorn's serum was injected every twelve hours, three doses. Patient died Thursday night.

CASE XII.—G., Ephrath, N. Y., worked at a Johnstown tannery; male, forty-five years old. Had pustule on face. Doctor Beebe made wide excision of pustule which he followed by a daily application of fuming nitric acid for six days, gave stimulating doses of quinine three times a day, and painted the area surrounding the wound with a tincture of iodine. Patient recovered.

CASE XIII.—K., male aged sixty-four years, hide handler on boats and dock. Patient noticed pimple on right cheek on February 18, 1917; it became larger and the surrounding area became edematous. He called on Doctor Kohlman, who described the lesion as a small pustule with vesicles on the edges with a slight oozing straw colored fluid; central area, slightly depressed, was of dark brown color with dark crust. The patient's temperature was 99.5° F. February 20th in the morning, and 100° F. at night on the 21st; temperature was 102° to 103°, 22nd 103.3°, then went down by lysis and became normal on the 11th day. Doctor Kohlman excised wound, making the incision one inch from pustule and applied Dakin's solution to the wound. He injected subcutaneously plain stock horse serum for seven consecutive days. Patient made an uneventful recovery.

CASE XIV.—J. B., longshoreman, Manhattan, male, thirty years of age. Lesion on neck. Noticed pimple on neck November 14, 1917; went to a dispensary; was diagnosed as "infected neck"; lanced and drained. On November 16, extensive edema set in; ambulance was called; was taken to Bellevue Hospital. Diagnosis of anthrax was made bacteriologically. Nothing could be done for the patient and he died the same day. The wife of the patient described to me a typical anthrax pustule but no diagnosis was made at the clinic.

Diagnosis.—A characteristic anthrax pustule cannot be mistaken for any other lesion. However, physicians that have never seen a case before will easily make a wrong diagnosis and may take it for furuncle, carbuncle, cellulitis, erysipelas, malignant carbuncle, or malignant edema. In a large city like New York where only twenty-five cases were reported in three years, you can make up your mind that all its 4,000 physicians are not in a position to see a case. Therefore many of the diagnoses were made at autopsy. On the other hand, some patient working at hides will walk into a physician's office with the diagnosis all made. Early diagnosis is of great importance because the treatment is so very different from other conditions, with which it may be confused. Wherever there is any doubt, bacteriological examination should be resorted to, and without delay. The research laboratory of the Health Department will gladly make the examina-

tion, or else it can be made at the physician's office. A little of the oozing serum, from beneath the central crust can be smeared on a cover glass and stained with any of the anilines, watery, or alcoholic solutions and examined under the microscope. During the first few days, the bacilli are more readily found than later on. Sometimes, the first manifestation is that of a minute red spot, or papule, and it is not itchy as often described. Only rarely is a history of itching given. Later, this looks like a severe furuncle and if the patient's vocation brings him in contact with hides, leather, wool, or bristles it can at once be suspected. Very frequently, as will be seen in the reports of the cases of the men, a pimple appeared and this was not noticeably red or itchy, and it was scratched with the finger nails, or cut with a razor. Later, it is noticed, the pimple steadily increased in size, without much pain, tenderness, or itchiness.

The first day, it usually resembles a furuncle, but should it be anthrax, there is a flaccid vesicle with turbid content, while a furuncle has a yellow pus content. The second and third day, when the malignant pustule develops still further, it becomes more characteristic. It has a black necrotic centre, usually surrounded by vesicles at the edge, and the base is indurated (button like); the size is one third to three fourths of an inch, and the surrounding area is edematous. There is inflammation of surrounding lymphatics. At this stage, it should not be mistaken for any other lesion. It should be mentioned that often at this stage (third or fourth day) the bacilli are no longer found in the pustule at the usual place of examination under the crust, but pyogenic bacteria and streptococci are found. However, the bacilli can be found in the indurated lower layers (rete mucosa). Further differentiation from furuncle is that the anthrax pustule does not contain pus, which is always present in furuncle; the latter is more painful, is larger than an anthrax pustule, its base is not indurated, and there is no surrounding edema. It is more difficult to differentiate anthrax from certain cases of carbuncles in which the centre dries down to a gangrenous crust. Here there is a marked resemblance to a malignant pustule, but again there is no surrounding edema, etc. At times, the pustule is to be differentiated from glanders; the anthrax edema is to be differentiated from erysipelas and diffuse phlegmon.

Points to be remembered for diagnosis:

- Occupation of patient.
- Exposure to infection.
- Character of lesion.
- Location of lesion—occurs frequently on neck, under the ear (not posteriorly), face, lips, hand, arm, and forearm.
- Surrounding edema and inflammation of the lymphatics.

MORTALITY STATISTICS.

In Italy, where anthrax is prevalent, there were reported from 1890 to 1904, 39,426 cases with 7,308 deaths (20.1%).

In Germany during

1910	there were 287 cases	40 died (13.9 per cent.)
1911	" " 281 "	40 " (14.2 " " ")
1912	" " 274 "	36 " (13.1 " " ")

In England during

1910	there were 31 cases	9 died (17.6 per cent.)
1911	" " 64 "	11 " (17.2 " " ")
1912	" " 47 "	6 " (12.7 " " ")

IN THE UNITED STATES

From April, 1915, to December, 1917, there were sixty-eight cases in New York State. Of these, forty-two recovered; twenty-four died (results in two cases not reported); this makes a death ratio of thirty-six per cent.; these occurred in different parts of the State, and it is interesting to subdivide the State for the purpose of viewing the success in treatment.

In Endicott (where we have the largest tannery) there were twenty-four cases—two deaths; Greater New York city had twenty-five cases—seventeen deaths (68%), and the rest of the State nineteen cases—five deaths (26.3%).

So that Endicott shows a greater number of recoveries than Italy, Germany, or England. It is interesting, to note that if we subdivide the State into two districts, the percentage of fatalities for up-State is seventeen—very much like that of England, Germany, and Italy.

TREATMENT.

The treatment in the sixty-eight cases was as follows: Actual cautery and serum treatment, four; all recovered. Rest and symptomatic treatment—ten cases; of these nine died and one recovered. Eichhorn serum treatment and rest was given in seventeen cases; five died and twelve recovered. Wide excision operation, including serum treatment and rest in twenty-six cases; twenty-five recovered and one died. Close excision (incision close to pustule), including serum treatment and rest in two cases; one died and one recovered. Wide excision operation with vaccine treatment, two cases; both recovered. In nine cases reported, the treatment was not given; eight died and one recovered. At some of these, diagnosis was made at autopsy.

The oldest method of treatment of anthrax known in medical literature is by means of destruction of the pustule, either by application of the actual cautery or caustics. In Russia, Siberia, Persia, and Asia, the cautery is still the chief treatment. The English surgeons first adopted the free excision method, and this was done at Guy's Hospital. After excision, the wound was swabbed with pure carbolic acid, followed with alcohol, then powdered ipecac was dusted on the wound and also given internally in ten grain doses. Muskett, in South Africa, was the first to use ipecac. He treated fifty cases, all of whom recovered. Washburn found that the anthrax bacilli were destroyed by heat, but not the spores; however, spores are not found in the human body. The subject of immunity against anthrax was taken up first by Toussaint in 1880, then by Pasteur in 1881, by Marchoux in 1895, and by G6rberheim in 1898, all having done valuable experimental work. Slavov, in June, 1897, began treatment of anthrax in man by means of a serum, prepared from animals, after combined, passive and active immunizations. In 1903, he treated 164 cases with this serum and had but two fatalities (1.2 per cent.).

In 1915 Adolph Eichhorn prepared a serum by making a preliminary inoculation (Parent method); then at regular intervals he inoculated the animal with virulent anthrax cultures. He collected the serum within fourteen to sixteen days later.

and used it for treatment of anthrax in man. It seems that the serum is a definite aid in the treatment of anthrax, and I might say that all the physicians whom I have interviewed in tannery centres share this opinion. Thirty to fifty c. c. of the serum are injected intravenously, giving about three doses from six to ten hours apart.

Dudley, of Endicott, very successfully follows out the method of excision used at Guy's Hospital, England, and no doubt has perfected it to a great extent; he treated nineteen cases without a fatal issue in the past year. He describes the method of operation in the *Journal of the American Medical Association*, January 5, 1918. This consists in making a wide excision of the pustule; applying pure phenol; neutralizing with alcohol and painting with tincture of iodine. He always administers thirty to fifty c. c. of Eichhorn's serum by means of intravenous injection. Three injections are usually given. Ellithorp, of Gloversville, N. Y., administers autogenous vaccine instead of the Eichhorn serum. He also performs the wide excision operation, preparing the vaccine by obtaining the anthrax bacilli from the pustule and growing it for twenty-four hours, and then boils it for three hours, and injecting twice daily, subcutaneously, giving a total of seven doses; otherwise the treatment is similar to that of Dudley.

The writer has observed that many of the surgeons, when making incisions, cut close to the pustule. By this method, the anthrax bacilli may gain entrance into the circulation, and the condition is made far worse than if no operation had been performed; cases also have been observed where no application of carbolic acid was made. It seems self evident that a germicide can do no harm, but rather good. It may destroy bacilli which may multiply and thus become the source of a local foci of infection.

Thermocautery has been used in four cases in this State, all of which have recovered. The cautery was in every instance applied direct to the pustule. Having observed the wide excision method and also the cautery method, it seems to me that the two can be combined with advantage.

I propose the following method of extirpating the pustule by means of the actual cautery: The cautery should be applied about two inches away from pustule, making a circle of about four inches, the same as done with the scalpel. Bring cautery to fascia and lift pustule intact. The destruction of the pustule is done from below upward, instead of from above downward. If the pustule is on the ear, nose or cheek, the extirpation cannot be made quite as radical. The method does away with any possible danger of forcing the bacilli into the general circulation by means of direct pressure, and therefore accomplishes a much wanted and sought for method of extirpating the pustule without exposing the patient to the possible spreading of the infection to the circulation or to adjacent tissues or structures. It is also to be preferred to the excisional method, for the reason of its greater simplicity. It is also practically a bloodless procedure; thereby diminishing the possibility of infection of the operator. I recommend that collodion be painted over the pustule prior to operation. The

skin surrounding pustule should be painted with iodine. This method is, so to speak, a cautery extirpation instead of a cautery destruction.

After treatment: Free incisions into edematous areas are essential. These incisions should be irrigated with Dakin's solution in the same manner as other wounds. The place of extirpation can also later be freely incised for this purpose, but only if edema is present. Dudley injects eight per cent. phenol in advance of the spreading area. Ice pack should be applied over a wet dressing.

Points to be remembered in the treatment:

Treat promptly.
Cautery extirpation.
Eichhorn's serum.
Free incisions in edematous areas.
Irrigation of these incisions with Dakin's solution.
Ice packs and wet dressing of wounds.
Symptomatic.

I wish to state in conclusion that a large city like New York, an important seaport where considerable importation of hides, wool and bristles takes place, should be better prepared to combat anthrax than it is today. A diagnostic clinic should be established for the treatment of anthrax. This may result in interesting the physicians to guard against mistaken diagnosis and in further improvements in both diagnosis and treatment.

OTOGENOUS TEMPORAL ABSCESS WITH HEMIPLEGIA.*

Facial Paralysis and Aphasia, Radical Mastoid Operation, Cerebral Drainage, Decompression, Recovery.

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The following case was referred to me on June 5, 1915, by Dr. L. W. Wittenberg:

Miss G. A. B., eighteen years old. When four years old, she had had scarlet fever, since which time the left ear discharged at intervals. Four years ago foul odor was noticed, the hearing became impaired gradually, and she recently became very dizzy and suffered from intermittent headaches, also loss of appetite. The patient, otherwise healthy in appearance, was psychically somewhat depressed and showed a rather slow cerebration. The left drum membrane was totally destroyed, the promontory covered by unhealthy granulations. From the attic protruded a whitish grayish mass which, upon microscopic examination, proved to be cholesteatoma. C 1 not perceived, C 4 only few seconds. Rinne negative. Weber to the diseased side. Whispered conversation voice not heard. Schwabach considerably shortened. Warm water and rotary nystagmus on the left ear were combined with severe dizziness and lasted thirty seconds. Temperature 98° F., pulse 70. The mastoid bone in the antrum region was very tender to touch.

Diagnosis: Chronic middle ear suppuration with involvement of the mastoid bone, and, possibly, of the brain.

Radical mastoid operation was advised, and this I did, on June 10, 1915, at the Philanthropine Hospital. Almost the entire mastoid cavity was filled out by cholesteatomatous masses and necrotic granulation tissue. This pathological process encroached also upon the tegmen tympani, which had to be

*Presented before the Section in Otolary, New York Academy of Medicine, April 12, 1918.

removed, and the dura was exposed to the extent of one cm. and proved to be normal upon inspection and touch. The radical operation was performed in the regular way, with the exception that the posterior wound was left partially open for drainage, on account of the exposure of the dura.

An uneventful recovery was made and she was dismissed from the hospital June 25, 1915, two weeks after operation. The following day, while at home, the patient became chilly, dizzy, and vomited. The next day she became convulsive on the right side of her body and soon afterward paralyzed on the entire right side, including the face, and lost her speech.

The patient was found by myself in a condition of drowsiness. There was total motor and sensory aphasia, rightsided hemiplegia combined with hemianesthesia and facial paralysis. Temperature was 96° F., pulse 48. The eye background showed bilateral optic neuritis, the pupils were unequal, the left one dilated and sluggishly reacting. Quite some photophobia was noticeable. Constipation and marked fetor ex ore were present. The patient was very dizzy toward the affected side, and showed marked sensitiveness upon percussion of the squama. Lumbar puncture showed a clear cerebrospinal fluid, with decreased lymphocytes and albumen. No microorganisms. The diagnosis of left-sided temporo-sphenoidal abscess was made and immediate exploration of the brain advised. The operation was performed on June 28th, at a sanatorium, Doctor Wittenberg assisting. The radical mastoid wound was reopened and the dura exposed further, starting from the tegmen tympani and antri upward toward the squama. The bone covering the dura was removed by means of rongeur forceps in a curved line around the meatus externus to the extent of two cm. At the lower aspect, in the region of the tegmen, the dura did not show any changes. Even in the region of the squama, after exposing quite a part of the dura, no discoloration was seen, nor was the dura at any part covered by exudate or granulations. According to Koerner's observation, the brain abscess is near the place of aural infection. Consequently, the dura was incised in the region of the tegmen and the abscess searched for by introducing the brain knife upward and inward three cm. No pus was struck. The same negative result was obtained when the knife was directed in an upward and anterior direction.

The dura was then exposed and incised in the squama region about 1.5 cm. above the upper canal wall and the brain explored. When directed towards the superior temporal gyrus, inspissated cheesy material together with brain sloughs were evacuated. A forceps was introduced closed, and opened within the abscess cavity to induce freer drainage. The cavity was then irrigated by means of warm physiologic salt solution and inspected by means of a long Killian speculum. The cavity was found to be rather large and surrounded by thick walls. Iodoform gauze one half inch wide was introduced by means of the speculum and a slender forceps to the bottom of the cavity and the latter loosely packed, the drain emerging from

above the mastoid wound, which was partially closed and drained from below.

The patient, next day, was in excellent mood, talkative, or at least trying to talk, for she could only mumble, but was very joyous. The dressing was changed first every day and then every second day. Immense quantities of decayed brain tissue were evacuating continually. An extensive hernia of brain tissue occurred. After the sloughing off of the hernia, the brain was retained in position by means of an aseptic paraffine net (surglets). The exposed brain portion with the use of scarlet ointment gradually became covered by epithelium.

The recovery of speech occurred in a most interesting way. She had to be taught like a baby. Her understanding of the spoken word gradually improved while the motor power to pronounce it showed only after one year of the operation considerable progress. At the present time, three years after, the patient talks almost normally, only the letter t and l being somewhat mispronounced. Under the influence of massage and electricity she gradually regained the muscular power of the paralyzed right extremities and is now able to walk eight blocks on a stretch, to do housework and make herself useful. The facial paralysis has entirely disappeared.

On October 4, 1917, Doctor Neustadter, upon neurological examination, found the following condition:

aggravated on the right side. The pupils are unequal and react normally to light and accommodation. There is a Babinski sign in the right foot. The Oppenheim reflex in the same foot is present, and also the Oppenheim reflex. Motor disturbances: There is a spastic hemiparesis of the right side, more marked in the right hand. The tongue deviates to the right. Speech: Signs of previous motor and sensory (auditory) aphasia. Cranial nerve disturbances: deafness in the left ear, double postneuritic atrophy, more marked in the left eye. Complete astereognosis in the right hand.

In conclusion, I sum up the following outstanding features: We apparently had to deal with a chronic temporal abscess caused by chronic middle ear suppuration with cholesteatoma. When the patient was first seen, the abscess was in the so called latent stage. The subjective symptoms were: dizziness, headaches, lack of appetite, depression and slow cerebration. At the radical operation, the exposed dura was found to be normal. Over two weeks later the manifest symptoms of brain abscess became evident, which may be subdivided, according to von Bergmann, into general symptoms, general brain and brain pressure symptoms and local brain symptoms. At the second operation, the dura did not show pathological changes, no fistula, granulation or exudate, pointing to an extension by contiguity from the middle ear process toward the deeper brain tissues. The abscess was located at the upper temporal convolution quite away from the middle ear focus. The infection therefore was an indirect one either by means of the lymphatics, the sheaths of the arteries or the nerves, or, according to Koerner, by extension of thrombophlebitis in the pial vessels. The abscess was first attacked from the logical port

of entrance, the tegmen tympani. When exploration from this point did not reveal pus, the dura was exposed higher up into the squama with the intention of attacking the abscess from that region and of having enough decompression to alleviate the pressure symptoms in case the abscess could not be reached from the squama region.

Prolapse of brain tissue is no untoward complication; it may be easily overcome by appropriate measures. The crossed convulsions, hemiplegia, hemianesthesia, facial paralysis, also the motor and sensory aphasia, are not caused by the extension of the abscess cavity to the respective foci within the cortex, neither to pressure action upon the motor and sensory nerve fibres within the capsula interna, as Dencker assumes, but to the remote action of the increased intracranial pressure upon and of the inflammatory reaction around the cortical centres within the anterior and posterior central and the inferior frontal gyri. Exploration of the brain in the latent stage of brain abscess is only indicated when the dura, upon local inspection, shows suspicious changes. In the manifest stage, the brain must be explored, even in the presence of apparently normal condition of the exposed dura. The exploration logically has to start from the region of the tegmen tympani, and only in case of negative result, at a place remote from the aural focus.

64 EAST NINETY-FIRST STREET.

X RAY AS A DIAGNOSTIC AID IN BACKACHE.*

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The title to this article may well appear to be presumptuous, inasmuch as it intrudes on the domain of practically every medical and surgical specialty. Yet it correlates them all, and has without doubt, from a diagnostic viewpoint at least, the most positive value of any other method in determining the causative factor of one of the most stubborn, intractable, and long standing ailments which the physician is called upon to treat.

It is merely reiterating an old established truth to say that backache is merely a symptom, the cause of which must be ascertained before intelligent treatment can be instituted, and yet to exclude every possible cause is to subject the patient to examination by the internist, surgeon, orthopedist (a gynecologist, if the patient be a woman), pathologist, neurologist, proctologist, and, in these days when the teeth are properly judged to be the focus of all sorts of bacterial evils, the dentist likewise, is oftentimes consulted.

The x rays have assumed the most important of all diagnostic methods and it is rare indeed when they fail to disclose some condition or lesion underlying the backache. In such conditions as myalgias or the frequently encountered backaches of the neurotic, the x ray is not always of service, yet the value on the negative side, as a differential measure, is of distinct service. Not infrequently, I have been able, in the latter class of patients, where a

Röntgen examination was made as a routine measure or even as a placebo, to discover a distinct pathologic process which could in a large measure and even as an entirety explain the so-called neurasthenic condition.

The vast majority of individuals complaining of this symptom refer their pain to the lumbar or lumbosacral region. Only relatively infrequently does the patient refer to the dorsal region when he seeks relief. Pelvic disease, surprisingly enough, is not a frequent cause of backache. Howerd A. Kelly, in his *Medical Gynecology*, emphasizes this point, saying: "My own experience teaches me that a backache is not often directly dependent upon any pelvic disease, though it is a common concomitant. I would attribute most lumbar aches rather to the neurasthenic or rundown condition of the patient, inviting a local disorder in a weak spot. This is often proven by the fact that the mere correction of a minor pelvic ailment, apart from the care of the general condition, does not do away with the backache; whereas patients with aggravated pelvic ailments, where we would most expect backache, often do not complain of it to any great extent. It is common to find backache associated with pelvic tumors of inflammatory masses pressing on the sacral nerves as well as with retrodisplacements of the uterus and chronic constipation, but, as I have said, I attribute the backache rather to the general rundown condition of the patient than to the local intrapelvic disorder."

Aside, therefore, from intrapelvic disorder in the female, in which the x ray is of service only in a negative sense, we have still a large assortment of conditions in which this diagnostic measure is extremely valuable. From the röntgenologist's viewpoint, these are difficult to classify, for backache is a symptom which, similar to headache, is only a manifestation of a cause, the etiologic factor of which must be traced and may be inclusive or reflex from almost any viscera or a structure within the body. Apropos of this, I was led to the writing of this article, after hearing a very instructive symposium on backache last winter at one of the meetings of the Philadelphia County Medical Society. An elaborate presentation was rendered by eight or ten physicians in the varied specialties, but what was to me most interesting, as a röntgenologist, was that the majority of the conditions described could have been discovered by a careful x ray study.

A condition frequently encountered by the radiologist and one on which more and more attention is being concentrated by the profession is sacroiliac sprain or subluxation, frequently and erroneously spoken of as sacroiliac disease. This articulation, now conceded to be slightly movable, particularly during pregnancy, frequently has an undue amount of motility producing a wider separation than normal between the articulating surfaces. This the x ray plate depicts, and not infrequently there may be secondary positional changes in the pelvis such as tilting, angular deformity, or even upward displacement.

Osteoarthritis of the spine is also a frequent cause of backache in which the x ray may yield valuable service. In this condition, the characteristic incipient changes such as spur formation on the

*Read before the Philadelphia Clinical Society, February 18, 1918.

vertebral margins, slight erosions and spots of rarefaction can be noted in the radiograph long before the clinical symptoms are sufficiently pronounced to make a positive diagnosis. Persistent backache, where there has been a previous history of operation for carcinoma, should put one on the alert for a possible spinal metastasis. These cases are by no means as infrequent as commonly supposed. Skill is needed in the interpretation of this condition in the radiograph. One such case referred to me was very puzzling, as characteristic secondary malignant changes were present in the lumbar vertebrae without any evidence of a previous malignancy until a careful history elicited the fact that the woman had had an operation on her breast sixteen years before. Both Pott's disease and curvatures, the result of faulty posture, are usually selfevident conditions clinically. The latter condition can very often be diagnosed by mere inspection, and yet the busy practitioner treating these cases routinely and not undressing the patient, overlooks a prolific cause of backache, which the x ray method easily spots.

New growths of the spine, either dense enough to cast a shadow, such as exostosis, or osteosarcoma, can only positively be diagnosed by means of the x ray, while tumors of the abdominal cavity or in the posterior mediastinum may cause sufficient pressure effects on the body or processes of the vertebrae as to cast distinct shadows in the radiogram. The same may apply to aneurysms of the thoracic aorta, posteriorly situated, and the sac of which is causing pressure. Several years ago such a case came under my observation where the leading and practically the only symptom was an intractable pain in the dorsal region of the spine. Fluoroscopic examination revealed a large annular sacculatation of the descending thoracic aorta, a condition previously unsuspected.

The results of old traumas, inducing vertebral changes and producing backache, are occasionally encountered in an x ray examination. Fractures of the transverse process are by no means as uncommon as supposed, and even a fracture of the body of one of the lower lumbar vertebrae has been undiagnosed until cleared up by the x ray examination. Such a case is illustrated in one of the plates accompanying this article.

CASE.—The patient, a man of forty, while in a reclining position, had a bale of hay fall on his back. He was in bed for only two weeks and has had at no time since paralysis or sphincter involvement. However, he has had persistent lumbar pain, and for the past eight months was unable, according to his statement, to do any work. As his is an industrial case, the casualty company became somewhat tired of paying him weekly compensation over such a long period of time. They became convinced he was malingering and referred him for an x ray examination. This revealed a crush fracture of the fifth lumbar vertebra, ample cause, it will be admitted, for a backache. When last heard from he was still receiving his weekly compensation, without further protest from the insurance company.

One of the most brilliant contributions of the radiologist to medical science is the diagnostic aid rendered in lesions of the urinary tract. Only a very small percentage of calculi fail of demonstration on the x ray plate. One of the most frequent accompaniments of a kidney stone is an intractable backache; not infrequently it is the only subjective

symptom, particularly if the calculus is lying dormant. Treated symptomatically by her family physician without relief for several months, one patient later went to a surgeon, who, following the discovery of the true condition by an x ray examination, performed a nephrectomy. The kidney at operation was nothing but a large pus sac, containing the calculi, none of which, however, had entered the ureter.

Small calculi in the ureter, especially in they produce obstruction, may also cause a profound degree of backache. The classical picture of pain referred along the course of the ureter to the genital organs is not always encountered, in fact, my experience has been quite the contrary. X ray examination almost invariably discloses the presence of these stones. Gallstones and diseases of the gallbladder are frequently accompanied by backache. It is unfortunate that roentgenology has not progressed to the point where gallstones can be demonstrated in every case when present, although, with our modern technic, a larger percentage of gallstones is constantly being discovered. The researches of George, showing that a gallbladder which can be visualized on an x ray plate is a pathologic gallbladder, is a distinct advance, and will doubtless help the roentgenologist to discover disease of this organ more frequently than in the past.

There are few lesions of the gastrointestinal tract that are not accompanied with backache. In gastric or duodenal ulcers, although pain and tenderness are usually found anteriorly, many cases, especially those in which ulcer is situated on the posterior wall, have pain referred to the upper lumbar region. These conditions, as well known, are being positively diagnosed roentgenologically.

Intestinal stasis is nearly always accompanied by backache. A routine barium or bismuth examination, following the progress of the opaque meal from its ingestion to its complete elimination, is the most valuable diagnostic measure we possess in the study of this condition. Not alone can we study the rate of progress, but either by the ingestion method or the introduction of an opaque enema, is it possible to study abnormalities in the colon. These may be of varied character, enteroptosis, kinks, angulations, reduplications or redundancy of the gut, strictures or valvulus, organic conditions which may be the mechanical cause of the so called incompetency or stasis. In the absence of the discovery of any of such conditions above enumerated, the stasis may be regarded as functional, and as a *sine qua non* of stasis is obstinate constipation, proper remedial measures whether surgical or medical applied for relief of the conditions disclosed by x ray examination should result in ultimate cure. Only occasionally are we fortunate enough to get the appendix filled with the barium mixture. A retrocecal appendix may cause distinct backache, and I have been able in few instances to visualize this abnormality in position. One patient, in whom I was able to demonstrate a retrocecal appendix, has had an entire subsidence of his backache following an appendectomy.

In this paper there has been no effort to do more than mention a few conditions in which x ray

examinations may prove of value in diagnosing the cause of backache. Many more might have suggested themselves, but those mentioned are the commoner ones encountered in routine practice. It will be ample satisfaction to have awakened even a slight interest in a diagnostic measure which can aid in clearing up the etiology of a chronic intractable backache.

1318 LOCUST STREET.

A PLAN FOR THE PREVENTION OF VENEREAL DISEASES IN NEW YORK STATE.

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As a foreword it may be pertinent to outline briefly the organization of the State Department of Health. The department is directed by the Public Health Council, of which the State Commissioner of Health is the executive officer. Subordinate to the commissioner are the deputy commissioner, the secretary and the directors of the various divisions—such as the Bureau of Vital Statistics, the Division of Child Hygiene, the Division of Tuberculosis and the Division of Laboratories and Research. The State is divided into fifteen or more sanitary districts, each of which is under the immediate supervision of a sanitary supervisor. The sanitary districts are subdivided into local health districts, in each of which there is a local health officer as executive officer of the local health board. There are over 1,000 of such separate health units in the State. In addition to the above there are medical and sanitary inspectors and public health nurses in the various sections of the State and local nurses in some of the local communities.

The State Department of Health purposes adopting a plan for the control of venereal diseases somewhat similar to that of the Social Hygiene Society of Oregon. For this purpose a committee has been placed in charge of this particular branch of public health work. This committee is composed of four members of the departmental staff and the secretaries of the American Social Hygiene Society and the New York Social Hygiene Society. The secretary of this committee is its executive officer.

The problem of venereal prophylaxis must be approached from two sides; first education and second, therapeutic. Education includes not only education of the lay public, but also education of the practising physicians of the State and the medical staff of the various institutions. Instruction is to be directed to the physician through circulars and bulletins which will constantly keep before him the necessity for laboratory confirmation of cures and the value of laboratory methods in diagnosis; by bulletins of information as to newer forms of treatment; by clinics and demonstrations of such therapy; by emphasizing the injustice of denying proper treatment to those who are unable to pay for it and by keeping the physicians informed as to where such patients can secure treatment without charge.

Instruction is to be directed to the public by leaflets of instruction to be given to diseased persons

by their attending physicians, these leaflets to lay emphasis upon the importance of laboratory control of the course of the disease. By pamphlets and circulars of information which shall deal with the causes and results of venereal diseases to be distributed to the general public by health officers, physicians, nurses, and officials of public institutions. By holding local and district meetings for both men and women and by giving lectures in factories, department stores and office buildings. House to house calls will be made by district nurses, and lectures will be given to adolescent children. Pamphlets on sex hygiene and venereal disease are to be placed in barber shops, billiard rooms, Y. M. C. A. reading rooms, etc. Exhibits will be held—permanent in the larger cities and traveling in the smaller communities. Permanent notices are to be placed in railroad stations, hotels, and comfort stations, calling attention to the advisory features of the Health Department and inviting correspondence with the department on the subject of sex hygiene and venereal diseases. Newspaper articles on these subjects will be issued, and here also attention will be called to the advisory function of the department.

If possible, we intend to secure the cooperation of the motion picture houses, and have these notices flashed upon the screens throughout the State at each performance. Lastly, the secretary of the committee on venereal diseases will answer all such correspondence as may arise through the efforts outlined.

Treatment of known cases of venereal diseases is necessary, and, to some extent, must be taken up by the department, since each untreated case is a constant source of danger to the community. Only a relatively small number of syphilitics are able to pay for proper treatment; some can pay for the drugs used but are unable to pay for the administration. The State Department of Health purposes, if sufficient appropriations are available, to make treatment possible for all. We are at present endeavoring to secure the cooperation of all the private and semiprivate institutions as well as public institutions in this work, and, in the larger cities we hope to see the local health boards establish venereal clinics for advice and treatment; such clinics have already been put in operation in some of the cities of the State; in those communities where this is not feasible the work will be done by the local health officials. The equipment for venereal clinics will be standardized and, as far as possible, all clinics will be brought up to these standards. There will be established at convenient points throughout the State means for diagnosis by dark field illumination, so that proper treatment for syphilis may be instituted at the beginning when it is known that the results are most favorable. It is our hope that means may be found for furnishing salvarsan substitutes to those who cannot pay for it. In regard to the treatment of gonorrhea and its complications, the same diagnostic and clinical facilities as outlined above are to be used. Equipment for this work will be subject to standardization. Vaccines will be furnished by the laboratory to physicians requesting them and also to institutions.

To insure any degree of success in this work, some

term of "follow up," is necessary. The new amendment to the Sanitary Code will, it is believed, materially assist in this campaign. This amendment reads as follows:

Regulation 29-a. Chancroid, gonorrhea, and syphilis.—Chancroid, gonorrhea, and syphilis are hereby declared to be infectious diseases highly dangerous to the public health.

It shall be the duty of every physician, when first attending a person affected with chancroid, gonorrhea, or syphilis, to furnish said person with a circular of information issued or approved by the State Commissioner of Health and to instruct such person as to the precautions to be taken in order to prevent the communication of the disease to others.

It is not required that venereal diseases be reported to the health officer, but in case a patient fails to take proper precautions, he may be reported to the health officer and any measures may be taken by the latter which in his opinion are necessary to conserve health in the community. The nurses will also do a great deal in "follow up" work, particularly among women.

A new law taking effect September 1, 1917, makes it a misdemeanor to advertise treatment for venereal diseases. The new section, 1142-a, of the Penal Code, reads in part as follows:

Sec. 1142-a. Advertisements relating to certain diseases prohibited.—Whoever publishes, delivers, or distributes, or causes to be published, delivered, or distributed, in any manner whatsoever, an advertisement concerning a venereal disease, lost manhood, lost vitality, impotency, sexual weakness, seminal emissions, varicocele, self abuse, or excessive sexual indulgence, and calling attention to a medicine, article, or preparation that may be used therefor, or to a person or persons from whom or an office or place at which information, treatment, or advice relating to such disease, infirmity, habit, or condition may be obtained, is guilty of a misdemeanor, and upon conviction thereof shall be punished by imprisonment for not more than six months, or by a fine of not less than fifty dollars nor more than five hundred dollars, or by both such fine and imprisonment.

Venereal diseases in relation to marriage.—Under an amendment to the Domestic Relations Law, in effect May 16, 1917, no marriage license may be issued until the applicant shall have subscribed to the following statement:

"I have not to my knowledge been infected with any venereal disease, or if I have been so infected within five years I have had a laboratory test within that period which shows that I am now free from infection from any such disease."

About two and a half years ago facilities for the laboratory diagnosis of venereal diseases were established by the State Department of Health. Up to that time there were no facilities available in New York State outside of New York City and Buffalo. The laboratory facilities even for private work were of the most limited and unsatisfactory character, and physicians generally had availed themselves of the newer methods for the control of these diseases to a very limited extent. There has been a very rapid growth in this work and the number of specimens now examined already exceeds those examined for any other disease. It has always been the policy of the State Commissioner of Health to precede or accompany as far as possible any new lines of work in the control of infectious diseases, by developing facilities for the laboratory control of these diseases to the largest possible extent. The situation now is such that it is hoped that the extension of the prophylactic work in this line may be rapid and effective.

OCUPATIONAL MERCURY POISONING.

Case Report.

By GEORGE SCHUYLER BANGERT, M. D.,

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It has been noted that women, children, tuberculous cases, and anemic and cachectic people are most susceptible to mercury poisoning. It has been said that the amount of mercury necessary to cause the trouble is the absorption to the extent of 0.4 to one milligram daily for some time. From a pathological standpoint we find the kidneys involved and albuminuria present. The trachea and mucous membrane of the mouth are coffee color.

CASE.—Male, aged thirty-five years; married; brown race; worker in chemicals on an operation which required the action of nitric acid on mercury. In his work he was inhaling the fumes of mercury nitrate, which compelled him to quit his work. His first most prominent symptom was that of bronchial and pulmonary distress due to the inhaling of the irritating fumes of the chemical reaction characterized by dyspnea, pain in the chest, dorsal back-

102° F. The next marked symptom was that of mercury absorption, characterized by a severe stomatitis, swollen gums, painful deglutition, grudging of the saliva, tremor of the extremities, restlessness, and loosening of the teeth. There was no desire for food; anemia, pain in the limbs, lassitude, and nervousness were marked.

Symptoms which were absent or not marked were diarrhea, which is rare in industrial cases; shivering, swelling of the hands, legs, or under the eyes; pus at the base of the teeth; swollen lymph glands; psychic disturbances—erethismus mercurialis—i. e., a shyness in the presence of strangers; ataxia; muscular activity of the body. In cases of mercury nitrate poisoning the question arises as to whether the trouble is caused by inhaling the fumes into the lungs or swallowing with the saliva to the stomach, then through the system. In working with this substance the greatest danger is the volatilization of mercury at ordinary temperatures. It has been noted that mercury is eliminated from the system by way of the lower intestinal tract, in the urine, saliva, and in the perspiration. As to prognosis, the tremors sometimes last for thirty years after the patient has given up the work. Mercury is regarded as the indirect cause of death which is brought about by lowered vitality and a tendency to tuberculosis. It is said to have a detrimental influence upon progeny.

Preventative treatment involves keeping face and mouth away from fumes, or wearing a respirator; changing the occupation frequently and keeping clean shaven; washing hands frequently, using aluminum acetate for perspiration; keeping hands clean with soap, and the teeth and mouth clean with suitable preparations; avoiding alcohol, tobacco, and fats; and the European practice of eating.

Actual treatment is directed toward the following points: removal from the work; eliminate the mercury by stimulating the intestinal tract; diuretics, and diaphoretics; proper food; proper ventilation; hydrotherapeutics; and local care for the stomatitis.

The following measures have been found useful:

intestinal elimination and plenty of water and spiritus aetheris nitrosi for the diuretic. Under diaphoretics such measures as hot baths, pulvis ipecacuanhæ et opii. Under this head should come also potassii iodidum or sodii iodidum. The food should be liquid, nourishing, and free from irritating features such as heat, cold, spices, or acid. The patient should have plenty of fresh air with proper protection; water baths and other hydrotherapeutic measures are beneficial, and a mouth wash of saturated solution of potassi chloras will be useful.

Abstracts and Reviews.

THE SURGICAL TREATMENT OF THE CIRRHOSIS OF THE LIVER AND THEIR COMPLICATIONS.*

BY WILLIAM J. MAYO, M. D.,
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The reaction of the liver to chronic irritation of any kind is in the nature of a connective tissue disease. This connective tissue deposit may be local or general and its morphology vary like the pattern of a carpet, but, if it is borne in mind that the liver cells are all alike, sharing equally in function, and that the natural reaction of the liver to chronic irritants, without regard to kind, is the development of connective tissue, the basic fact will be established without being lost in a mass of morphologic detail. On the contrary, the response of the liver to acute destructive irritants, whether bacterial, toxic or chemical, is in the nature of an acute fatty degeneration.

The chronic cirrhosis naturally divide themselves into two fundamental groups: First, portal cirrhosis, in which the irritants, bacterial, toxic or biochemical substances, are received from the intestinal tract and from the spleen by way of the portal vein, and in which the connective tissue is deposited about the portal radicles. Localized portal cirrhosis is not uncommon and produces few or no symptoms. Second, biliary cirrhosis, in which the irritants reach the biliary ducts by direct extension of infections, as from gallstone disease or from hematogenous infections, usually portal but not rarely systemic, such as those following pneumonia, typhoid fever, focal lesions, etc., and in which the connective tissue deposit is related to the biliary ducts. Localized biliary cirrhosis is not uncommon and may cause no symptoms. The many varieties of cirrhosis described are to be looked on as variations and combinations of these two main divisions.

Advanced portal cirrhosis gives rise to clinical symptoms which depend to a large extent on portal circulatory obstructions shown by the ascites, and the frequency of gastric hemorrhages. Jaundice is absent or a terminal condition. Advanced biliary cirrhosis, on the contrary, depends on infections in the biliary ducts, and jaundice is an early, prominent, and often continuous feature. Ascites is absent or a terminal manifestation. It would appear that we recognize as biliary cirrhosis only the late

stages of a relatively frequent liver condition after more or less permanent damage to the liver tissue has taken place.

The spleen will be found to be enlarged in a high percentage of portal and biliary cirrhosis, and it seems altogether probable that in a certain number of cases this enlargement is primary and causative, as in splenic anemia.

In a series of fifty-two cases of splenectomy for splenic anemia there were a number in which the liver showed portal cirrhosis. When it is considered that the splenic vein under normal conditions is about one sixth the diameter of the portal vein, and that, in the enlarged spleen, the vessels are correspondingly increased in size, it will readily be seen that the removal of the spleen in suitable cases affords a quick and certain method of relieving the portal circulation. As the operation of splenectomy, which prevents the blood from reaching the portal vein, is not one of great difficulty, it would seem, in suitable cases, to be even superior to the Talma-Drummond-Morrison method of diverting the blood from the portal to the systemic circulation through the venous compensatory channels of Sappey.

The Talma-Drummond-Morrison operation was performed twenty-eight times, with four deaths. Eight of the patients have died at various dates following operation, the remainder were more or less benefited; five are in good condition. Investigation of the cases showed that good has resulted, particularly in the cases of nonalcoholic cirrhosis seen in the young, but, generally speaking, the results have been disappointing. In ten cases of cirrhosis of both types, splenectomy gave immediate relief to nine; one patient died from the operation. I would emphasize the feasibility of reducing the portal circulation by splenectomy and similar procedures, thereby relieving the subnormal liver of its overload.

Electrical Treatment of Muscles in Trench Foot.—G. Murray Levick (*British Medical Journal*, March 30, 1918) says that in the later stages of this condition there is a functional loss of movement in the intrinsic muscles of the foot, wasting of the muscles, tissue changes, and extravasation from the vessels and inflammation with exudation into the tissues. Massage and passive movements are highly beneficial, but even more so is electrical treatment which should be carried out as follows. For fifteen minutes the patient sits with his feet and ankles immersed in warm water, up to 110° F. if not too painful. Then the water is removed so as to cover only the soles and toes. An indifferent electrode of wet lint encircles the ankle of one foot while the active electrode of carbon is immersed in the water in front of the toes. The faradic current is slowly introduced, interrupted about fifty times per minute by a metronome, and increased until rhythmic contractions of the intrinsic muscles of the foot are produced. By altering the position of the carbon in the water all of the muscles can be stimulated. One foot is treated at a time. The treatment should continue until there is evidence of slight fatigue of the muscles.

*Abstract of paper presented before the American Surgical Association, Cincinnati, June 7, 1918.

Medicine and Surgery in the Army and Navy

TREATMENT OF COMPOUND FRACTURE OF THE FEMUR AT CASUALTY CLEARING STATIONS.

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The principles of treatment which are described apply equally to compound fractures of other long bones, except in that amputation is indicated less frequently in fractures of the upper extremity for various reasons than in those of the lower extremity. Sepsis in the upper extremity is on the whole less virulent; radical conservative operation is frequently much easier and produces less shock; the general condition of the patient is better able to withstand the longer operation and the greater strain during convalescence, and it must be remembered that an artificial lower limb is comparatively much more satisfactory than one fitted to the upper extremity. It must also be remembered, however, that while a gunshot wound causing compound fracture of the femur was at one time looked upon as one of the gravest of war injuries, yet a more widespread appreciation of sound principles of treatment and a thorough application of these principles have led to a marked reduction on the previously high rate of mortality and to improved functional results.

In no class of cases is it more important that adequate treatment should be begun early, than in the large one comprising fractured femurs. Surgeons at casualty clearing stations bear warm testimony to the great improvement which has taken place in the early treatment of these cases by regimental medical officers and field ambulances, and reports from base hospitals indicate that the "goods are now delivered in very good order" from the casualty clearing stations. In the hands of skilled, experienced surgeons the immediate results will probably be better still as an increasing number of wounds are sutured primarily or within a very few days. Thus a prolonged, weary, and precarious convalescence will be avoided. A word of warning must be given against undertaking primary suture until the essentials necessary in successful early treatment of wounds are fully mastered. Attention to this warning will probably save many limbs and lives. The treatment carried out before the patient reaches the casualty clearing station has been described fully in a previous paper (1). All cases of fractured femur should pass through the operation theatre of the casualty clearing station, because often, when thorough examination is made, a case which has appeared comparatively simple and not likely to require operation shows that operation is urgently required. Unnecessary handling should be avoided and examination in the theatre is the best way of insuring this.

Anesthetics.—If wounds of other parts of the body exist, a general anesthetic, in most cases ether, is required. Two or more surgeons, according to the number of wounds and the staff available, should deal with such cases. If shock is or has been pro-

nounced, especially if amputation has to be performed, gas and oxygen is the anesthetic of choice. For simple cases without shock, spinal anesthesia—ten per cent. novocaine, one to two c. c.—is to be preferred. If the patient has lost much blood, transfusion should be carried out before the spinal anesthetic is injected.

General condition.—Although men injured in such good condition nowadays that they are fit for immediate operation, in many the effects of shock, hemorrhage and sepsis are present to such an extent that they require the employment of special combative measures. The general treatment of surgical shock and hemorrhage need not be discussed. Transfusion of whole blood, in addition to warmth and rest, provides the most certain restorative. Active hemorrhage may require the use of a tourniquet, if this is not already applied, and prompt removal to the theatre. Both sepsis and shock require the administration of bicarbonate of soda, by various routes, in order to prevent or neutralize acidosis.

One may well be pardoned for reiterating certain points in connection with these injuries. Men with compound fracture of the femur should be disturbed as little as possible after their arrival at the casualty clearing station. They should be sent without delay to the preoperation or resuscitation ward. No case of this kind should be evacuated to the base without first passing through the operation theatre. Small superficial wounds are deceptive and almost invariably cloak much extensive damage of the deeper tissues. When lodgment of the shell fragment which caused the damage has occurred, operation must not be postponed, however small the aperture of entrance, as it may sometimes be when an undistorted rifle bullet is the cause. Patients in whom hemorrhage is taking place or is controlled by a tourniquet will naturally be given precedence in going to the theatre. Whenever possible, inadequately splinted cases should have next precedence; when this is not practicable the fixation should be improved. If the limb is not put up in an efficiently applied Thomas splint, no attempt should be made to remove the clothing until after full anesthesia has been established or until proper fixation has been achieved.

When the patient reaches the operating theatre, care must be taken that no increase of shock occurs from unnecessary or rough handling. Probably the soundest plan in all cases is to lift the stretcher on to the operation table, anesthetize the patient and remove his clothing before the stretcher is taken away. Thereafter bandages and splints are removed and the nature of the injury investigated. In suitable cases, the limb is then raised from the table by the apparatus shown in the diagram. Some advise operating without removing the Thomas splint and extension. Adequate operation under such conditions can be done only in the most simple cases and therefore this procedure is not recommended. In order to make quite sure of finding and removing all septic material it is advisable, when easily possible, to project both broken ends of the bone out of the wound.

Obviously this manœuvre can not be done satisfactorily without removing the splint. The simple device recommended frees the orderly from the arduous task of holding up the limb during the whole period of the operation. It can be easily unhitched when necessary. The ordinary ritual for disinfec-

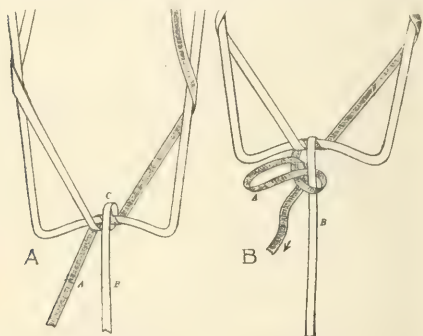


FIG. 1.—Method of tying the extension bandage in fracture of the femur so as to prevent slackening of the adjustment and loss of time during adjustment. Pull and hold A taut (see left hand diagram); pull and hold B equally taut, thus fixing A at C. A may now be left loose. Tie loop knot with A on B and draw up tight to C (see right hand diagram). In adjusting, hold B taut; undo loop knot; hold A taut and pull to its own side. Pull B taut and proceed as above, merely substituting B for A.

tion of the skin and the subsequent general technic need not be described.

The first step in the actual operation should be excision of the superficial wound, followed by a determination of the main pockets by the finger. The wound should then be opened up in the direction of these pockets, unless this entails the division of important structures. The full extent of the injury to muscles and bone must be seen. The eye must be our guide as well as the finger. It is only when a thorough survey of the injury has been so obtained that the operator is in a position to decide the sub-

will arise in a proportion of cases. In some hopelessly mangled limbs the decision is easy. There are many borderline cases where there is great difficulty in deciding what is the proper course to steer. It is a good plan to hold an informal consultation in such cases. Amputation should be performed: 1. When the main vessels, both artery and vein, are divided and collateral circulation has not been established; unless, as happens in rare early cases, some form of bloodvessel anastomosis can be performed, *e. g.*, by intubation with a paraffin covered glass tube, until danger of gas gangrene has passed. The tube is removed when pulsation in the part of the vessel immediately distal to it has ceased, usually after twenty-four to seventy-two hours. 2. When gas gangrene is definitely established in more than one group of muscles, or where, for anatomical reasons, complete excision of any infected part can not be carried out. 3. When either the main artery or vein requires ligation, and there is evidence of even a localized patch of gas gangrene beyond the point of injury to the vessel. 4. When the sciatic nerve is hopelessly destroyed. 5. When virulent sepsis is already established in extensive wounds, the patient being in low condition.

In cases where the general condition of the patient is bad, especially as a result of shock hemorrhage, the inclination is toward amputation, unless blood transfusion completely changes the picture. Involvement of the knee or hip joint does not by any means necessarily call for amputation. The same may be said of extensive laceration of muscles and severe comminution of bone if the circulation is good and there is no evidence of gas gangrene in the wound.

When amputation is decided on, the circular or modified circular method, as low down the limb as possible, is the one which should be employed. In some cases where speed is essential, the amputation is made at the site of fracture, the bone being

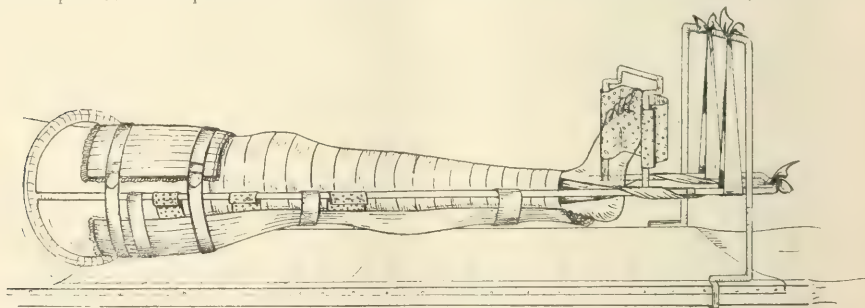


FIG. 2.—Diagram of application of Thomas's splint outfit for transport of fracture of femur from casualty clearing station to base hospital. The final encircling bandage and the padding for the foot are not shown.

sequent course he should adopt in each particular case. The size of superficial wounds is no indication of the deeper damage. Most extensive laceration of muscles and severe comminution of bone very frequently underlie apparently trifling skin wounds. The superficial incision must be very free.

Amputation.—The full extent of the wound having been appreciated, the question of amputation

trimmed at a later date. When sawing the bone, a strong flat metal plate with a slot in it to admit the femur is useful in keeping muscles out of the way and in saving time. In order to prevent superficial necrosis of the sawn bone, a layer of deep muscle fibres may be stitched over it. The dressing used is either a pack or Carrel's method. Primary suture is dangerous in many cases. Such amputation

stumps are ideal wounds for the application of a pack. The flaps are drawn over the pack and fixed by widely placed sutures or strips of adhesive plaster. A practical point is that room should be left between the skin edges for drainage when the sutures or strips of plaster are being applied.

Conservative treatment.—If conservative measures are decided on, the operator must make up his mind to perform a thorough operation on the lines described in a previous paper (2). It is well to emphasize again that, in addition to the careful removal of foreign bodies, the superficial wound must be completely excised, and all badly lacerated fascia and muscle cut away. With regard to the muscles,



FIG. 3.—Diagram of rope and pulley apparatus for raising leg from operating table.

contraction alone is not a sufficient guarantee of the necessary degree of vitality; definitely bleeding muscular tissues must be reached before one holds one's hand. Great care must be taken that the vascular supply of muscles previously treated are not cut through during the later stages of the operation. Once embarked on such an operation there must be no half measures. Most extensive dissections may have to be carried out. There must be no hesitation in cutting wide. The principles which guide us in the operative treatment of malignant disease must be applied. One small piece of devitalized muscle left in the wound may be sufficient to render the whole procedure useless. Bone fragments, unless completely separated, should not be removed. If a joint has been directly opened by a missile, the operation is carried out in the way indicated in the paper *Treatment of War Wounds of Joints in Advance Medical Units* (3). Perfect hemostasis is essential. The operative technic is the same, whatever form of aftertreatment is followed. In many cases in which operation is performed within about twelve hours of the infliction of the wound, when no evidence of acute inflammation is present, primary suture should be carried out. Previous to closure, the whole surface and all crevices of the wound may be rubbed gently with solutions or pastes of some of the recently introduced antiseptics, as flavine, brilliant green, etc. Great care should be taken to obliterate dead spaces as far as possible by well placed, not tight, deep sutures. These must not interfere with the blood supply of the parts. A drain

should be inserted for twenty-four to forty-eight hours down to but not into the area of fragmented bone. In cases of doubt the wound may be packed with gauze saturated with antiseptic aqueous or paraffin solution. In two to four days, if no inflammation occur, delayed primary suture can usually be done with safety.

Operation having been completed, all that remains to be done is to immobilize the limb. Incomplete fixation may lead to failure, in spite of the most careful operative treatment. The Thomas knee splint, as pointed out in previous papers, is the one now used in the vast majority of cases. A satisfactory splint in all cases of high fracture associated with wounds of the buttock or perineum has yet to be discovered. Abduction frames have many drawbacks, but are meanwhile the best available for transport. Unless great care is taken, pressure sores develop rapidly when these are used.

Fixation by the Thomas splint.—A Thomas splint outfit, properly used, is the simplest and most efficient method of obtaining complete fixation at this stage. The detail of the application is, shortly, as follows: 1. The suspensory sling is removed from the knee, and the limb is supported and pulled down by an orderly. 2. For application of the extension bandage it is not necessary to shave the limb. Paint the entire circumference from the malleoli upward sufficiently high to allow the extension to get a good pull on the lower fragment, with a glue solution, of which the formula is:

Thymol	.....
.....
.....

A shaving or small painter's brush is used for applying the glue. During a battle a pot of this glue should always be kept ready melted. The glue will become too thick after a time, and a little water should then be added. The glued on bandages can be removed with warm water. Next apply, on either side of the limb, a length of bleached calico bandage, and run a roller bandage round the limb.

3. The ring of the splint is passed over the foot and pushed upward, until the posterior part of the ring presses firmly against the ischial tuberosity.

4. To tighten the extension bandage the surgeon takes an extension bandage in each hand and, making strong traction, passes one of them over the other under, the lateral bars of the Thomas splint. First one bandage and then the other is thereafter passed round the notch in the cross bar, a complete turn being taken in each case. The turns are taken in opposite directions, and the last overlaps the first. The ends are made secure by tying a half bow. 5. In cases where the wounds are in such a position that it will be necessary to remove the ham splint for dressing purposes, slings formed by bandages or, better still, perforated zinc strips should be applied at this stage. The zinc strips are thinly padded and covered with waterproof material. They are applied so as to leave the wound clear, but at the same time support the fragments when the ham splint is removed. One such sling should always support the knee or upper part of the calf. 6. The

pads serve the purpose well. Over these a sheet of jaconet is placed to prevent soiling. The ham splint is now slung to the side bars of the splint by three strips of adhesive plaster, the adhesive side being next the ham splint. This effectually prevents lateral movement of the ham splint. The posterior padding should be of such amount as to cause slight flexion of the knee. Sagging of the thigh must be prevented.

7. The anterior thigh splint consists of a piece of Gooch's splinting applied to the thigh, canvas side toward the limb. It should extend from near the ring of the Thomas splint to just above the patella. A number of suitable lengths of Gooch's material should be kept ready cut. The whole roll may be sawn through; an orderly can cut off any breadth required. The thigh splint is fixed by the bandage which is now applied to the limb from the ankle upward. This bandage encircles all the splints. A bandage, passing across the extreme upper part of the thigh from bar to bar of the splint, may be necessary to prevent flexion of the upper fragment. Care must be taken that any padding or small splint used does not press on the main vessels. 8. The foot must be supported at a right angle by means of a metal foot rest, which is part of the outfit. A gutter of perforated zinc sheeting is fixed on the footpiece. The foot, or gutter, is padded. This arrangement allows free dorsiflexion of the foot, a movement which the patient should be encouraged to make frequently. The circulation of the limb is thereby assisted. Rotation of the foot can be prevented by various simple means, e. g., by a strip of sticking plaster fixed to one bar of the splint and encircling the ankle. 9. The suspension bar should always be used during transport. To this the Thomas splint is slung by two pieces of bandage, one attached to either bar of the splint. If no suspension bar is available, the leg must be slung by some other means. If the patient cannot be evacuated, the injured leg must be slung in the wards. A simple method is the use of two bandages each passed over a beam of the hut. The two ends of one bandage are then tied to the bars of the splint close to the ring. The ends of the second bandage are secured to the bars at the level of the foot.

Many modifications of this method of fixing fractures of the femur have been introduced, but it still remains the simplest and not the least efficacious.

Evacuation.—Many cases of compound fractures of the femur may be safely evacuated as soon as they have recovered from the anesthetic. Before evacuation the extension should always be inspected; the bandages may require tightening or loosening. A pad of wool may be required between the ring and anteroexternal part of the thigh, so as to prevent the ring from nipping the scrotum or slipping off the tuber ischii. In cases of men who have to be kept at a casualty clearing station for more than twenty-four hours, the superficial dressing should be changed before evacuation on account of oozing. Here also care must be taken of the skin pressed on by the posterior part of the ring; it should be pulled upon to change the point of contact and carefully dusted. Alteration of the degree of elevation of the splint, or propping up the patient, frequently adds to his comfort.

I have quoted largely in some parts of this article from a paper by Lieutenant Colonel R. C. Dunn on Treatment of Compound Fracture of the Femur, which appeared in a pamphlet on *War Wounds*.

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MEDICAL NEWS FROM THE FRONT.

Cerebrospinal Meningitis Among the Troops.

GENEVA, April 25, 1918.

As not a few cases of cerebrospinal meningitis have occurred in the French army since the beginning of the war, much attention has been given to the study of the cerebrospinal fluid, and therefore it may perhaps be of some interest to examine the present knowledge acquired.

Macroscopically, the cerebrospinal fluid withdrawn by puncture during a cerebrospinal meningitis is cloudy or even purulent, with a yellowish green reflection to light. When allowed to repose in a tube for a few minutes, the upper portion becomes clear, while in the lower portion a viscous and very purulent deposit develops. Some yellowish shreds of fibrin will also be observed on the sides of the tube. It is impossible from the mere aspect of the fluid to make a diagnosis and prognosis in a given case and all that can be said is that a clear fluid is generally an index of tuberculous meningitis, while a grayish liquid, pulverulent and badly mixed, indicates a meningeal infection caused by the ordinary bacteria of supuration (streptococcus, staphylococcus, pneumococcus). Therefore it may be assumed that a turbid or purulent fluid usually means cerebrospinal meningitis. The macroscopical aspect of the fluid consequently allows one, approximately, to conclude in favor of a cerebrospinal meningitis, but the same cannot be said for the prognosis. Certain very serious cases offer a relatively clear fluid, while some mild ones offer a very purulent one. However, a marked purulency usually means a severe case, while a slight turbidity, progressively decreasing, usually is a good sign from the viewpoint of the evolution of the affection. A macroscopic examination of the fluid offers certain exact data toward the diagnosis and prognosis of the meningitis and even dictates some practical rules of every day treatment.

Suppose, then, that a subject presents clinical symptoms of a meningitis. A lumbar puncture is made, withdrawing a turbid or purulent fluid. Without waiting for the laboratory results an injection of serum should be given at once, and the following day, according to a positive or negative report, the injections will or will not be continued. On the other hand, supposing the fluid is limpid? In this case the laboratory report should be waited for before giving antimeningitic serums. Usually in this case the patient presents either mild symptoms of meningism which do not require serum treatment, or the case is one of tuberculous meningitis where antimeningitic serum would be harmful.

There is yet a third clinical picture, namely, the

fluid withdrawn is clear, but an epidemic of cerebrospinal meningitis exists, and the subject presents clinical symptoms of the affection. In these circumstances an injection of serum should be made, while awaiting the result of the bacteriological examination. Should the physician do otherwise, he may, perchance, lose precious time, because it is at the beginning of the disease that the serum is the most active, and it is unquestionably better to inject anti-meningococcic serum in a case of tuberculous or other form of meningitis than to delay in the case of cerebrospinal meningitis. After an injection of serum one occasionally notices that a limpid cerebrospinal fluid has become turbid when withdrawn later, but one must not conclude the case to be one of cerebrospinal meningitis and, therefore, continue the intraspinal injections. He should recall that the serum may set up a seric inflammation and that the turbidity of the fluid is due to this and will rapidly disappear when the injections are stopped. By cytological examination of the cerebrospinal fluid from a full developed case of cerebrospinal meningitis a large number of polynuclears will be found and is one of the elements which differentiate this disease from the tuberculous form. In the latter there are very few polynuclears but a great many lymphocytes. Most of the polynuclears have undergone histolysis. Their borders are ragged, their protoplasm has lost its granulations, the nuclei their chromatin. Some contain vacuolæ. They are larger than normal and form a mass whose different parts are little differentiated, likewise little from the medium surrounding them. They represent pus cells and some may be still more changed. Their contour is in this case absolutely ragged, their nucleus has disappeared, and they soon become mere cellular debris. When the fluid is withdrawn several successive times it will be found that the cell formula will greatly vary even in very short intervals. Sometimes a large number of almost unaltered polynuclears is found, in which case they are small, distinctly rounded, and with clean cut borders, so that they are quite similar to the polynuclears of the blood. However, if attentively examined after staining with Ehrlich's triple acid stain, it will at once become evident that their nucleus is much less delicate than that of normal polynuclears. It has neither the fineness of contour nor the variety of detail.

In some cases the nucleus recalls, by its shape, that of eosinophile polynuclears, but can be distinguished by the absence of granulations. The vital stains at this time show that the polynuclears are still living, but the homogenisation of their protoplasm and nucleus clearly shows them not completely intact. Then, as they remain in the fluid, they undergo histolysis and assume all the characters of degenerated polynuclears.

Consequently it would seem that these polynuclears do not enter the spinal fluid separately and in a regular, continued, and constant way, but rather by irregular successive outpourings, probably following in this, the alternatives in the evolution of the injection. And a fact among others is that an increase in the number of polynuclears corresponds nearly always to an aggravation of the clinical symptoms of the disease.

A purulent spinal fluid always contains a large proportion of dead or more or less lesioned cells, for the most part polynuclears and represent about seventy-five per cent. of the total cell mass. If the spinal fluid is limpid it must be centrifugated and only then will a minute sediment be obtained, so little in fact, that it cannot even be seen. Therefore, there is very little pus and consequently very few cell elements, so few, that with a 1/100, from three to fifteen cells are only found in the microscopic field. These are not generally much changed. But not only is the cell formula of this fluid less abundant but even inverted. The polynuclears are in small number, from nought to twenty-five per cent., while the remainder of the cells are mononuclears, and among these lymphocytes are the most numerous (thirty to thirty-five per cent.), then come the medium nuclears (twenty to thirty per cent.) and lastly large mononuclears (ten to fifteen per cent.). The latter rarely offer a macrophagic aspect but when they do it is very distinct.

Agglutination is the best procedure for the identification of the meningococcus. The specific sera always agglutinate the typical organism. But the rate of agglutination varies. Unprepared horse serum or normal human serum may agglutinate at 1/25, but a positive result will only be of a certain value if the phenomenon occurs with 1/100 or even at 1/600 or 1/1000. Cultures of the organism several days old should not be employed because they have often lost their agglutinative qualities, but should one operate in these circumstances a negative reaction must not be taken into consideration.

I confine my concluding remarks to the changes taking place in the spinal fluid during the evolution of cerebrospinal meningitis.

I have already said that the spinal fluid is always clear during the first twenty-four hours of the meningitis and, if occasionally puncture withdraws a turbid or purulent fluid, it is because the puncture has been done later than in the first twenty-four hours of the disease. It must be recalled that the meningococcus may invade the subarachnoid spaces some time before its presence is made evident by clinical symptoms, and this phenomenon is due to the really remarkable tolerance of the nervous system. During the first twenty-four hours the spinal fluid will consequently be clear, likewise albuminous, poor in bacteria and still more so in cells, the latter being mostly mononuclears. Future punctures will withdraw a progressively more turbid or even purulent fluid and the number of meningococci increases a little. These bacteria have no constant formula in the liquid and by resorting to puncture at short intervals their number and form will be found to vary considerably. There are alternatives of swarming numbers and complete absence of the germs which are in no way related to the clinical symptoms nor parallel to the gravity of the disease. The changes occur without apparent cause, occasionally after an injection of antimeningococcic serum. The polynuclears likewise alternate in their numbers, but the afflux of bacteria and white cells are always more together. It would seem the afflux of cells is more frequently related to an accentuation of the morbid phenomena. These various changes show the utility

of making several lumbar punctures if an exact idea of the elements composing the spinal fluid during the evolution of a cerebrospinal meningitis is to be had. Little by little the spinal fluid clears, the specific bacteria become fewer and finally disappear completely. The number of cells decreases, the polynuclears gradually diminish, the lymphocytes increase and everything tends to return to the normal in a week or ten days after the clinical symptoms have ended. However, occasionally the spinal fluid takes a longer time to return to its normal cell formula and even when this has become established, it may from time to time become irregular, an evidence of temporary inflammatory outbursts.

CHARLES GREENE CUMSTON.

MEDICAL NEWS FROM WASHINGTON.

The Mayo Brothers Resign.—Army Contracts for Medical Supplies.—Is a Pharmacist a Surgeon?—Which Board Shall Control the Rehabilitation of Returned Soldiers?

As intimated in these columns last week, Majors William J. and Charles H. Mayo, of the Medical Reserve Corps, will not be required to serve in connection with the general staff of the army, their protests against such an assignment having resulted in a revocation of the order. They refused to reconsider the matter and take over the general staff duties it was intended for them to perform, and it was stated that both would submit their resignations from the Reserve Corps unless the order was revoked.

* * * * *

The Surgeon General of the Navy is to purchase medical, hospital, and dental supplies estimated to cost about \$2,825,000. The schedule of purchases is intended to cover the needs of the Bureau of Medicine and Surgery for the next fiscal year. It is necessary to meet the exceptional demands imposed by war, at home and abroad, on shore and at sea, including new supply depots at Brest and Liverpool.

However, it is neither desirable nor economical to contract for all the supplies at one time, since the needs of the entire year cannot be definitely estimated. In order to secure the best results, the supplies must be procured from time to time throughout the year. The contracts will be placed without advertisement among concerns that are selected to enter competition for the orders, it having been found that newspaper advertisement for bids has induced competition from undesirable bidders and resulted in the furnishing of supplies of an inferior quality. Even the most rigid inspection is an insufficient guarantee of the purity and quality of many drugs, the therapeutic value of which only can be determined by their physiological action. The method of purchase is the same that has been followed satisfactorily for a number of years.

* * * * *

A clause, from some mysterious source, relating to appointments of assistant surgeons in the navy, appears in the pending naval appropriation bill as it passed the Senate and now is awaiting action of the

conference. It provides that hereafter "no person shall be appointed as assistant surgeon in the navy who is not a graduate of a standard medical college." It was embodied in that part of the measure that relates exclusively to the Naval Dental Corps, and, of course, it bears no relation to the legislation affecting the members of that branch of the Medical Department.

Apparently, it is aimed at the pharmacists of the navy, some of whom have been given temporary appointments as assistant surgeons as a means of deserved promotion corresponding to that accorded during the present war to those of similar grades in other branches of the navy. In order that these men might be given a temporary reward, for the period of the war, it was necessary to give them the appointments they received, for no commissioned grades are allowed directly to the pharmacists.

At the time the appointments were made, there was some discussion as to their propriety, and it was realized that there was a certain inconsistency in appointing pharmacists as assistant surgeons when they had not qualified as graduates in medicine, but there was no opportunity at the time to seek legislative relief without delaying the advancements of individuals most directly concerned. It was appreciated, however, that the matter was largely one of title, possession of which would do no harm, so it was decided to make the appointments and adjust the matter later. If the former pharmacists, who now are assistant surgeons, retain commissioned rank after the war, as is likely to be the sequel in all such cases, there doubtlessly will be a change of title without impairment of the status of individuals.

* * * * *

A discussion is going on in the several medical branches of the Government as to which governmental agency is to care for men returning from abroad who will be discharged from the military service on account of physical disability. The most recent aspirant for this activity is the Public Health Service, basing its claim for recognition on the fact that a representative of the war risk insurance bureau had requested information as to the available bed capacity of marine hospitals to provide treatment for men discharged from the army and navy on account of disabilities incident to the service.

The matter has been receiving the serious attention of the Surgeon General of the Army, who went ahead with a general plan to provide for rehabilitation, although his legal right to do so has been questioned. The bill now in conference providing for vocational rehabilitation and return to civil employment of discharged disabled persons provided that the federal board for vocational education shall have charge of the training of the men after discharge and before that time may lay plans for training in cooperation with the Surgeon General of the Army and the Surgeon General of the Navy, who are to have absolute control of such men as are undergoing treatment previous to discharge.

* * * * *

Under a resolution introduced by Representative Gould, of New York, candy would be added to the rations of all enlisted men of the American and expeditionary forces.

Editorial Notes and Comments

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THROUGH THE PRISONS BACK TO SOCIETY.

A plea for consideration and betterment of the prisoner on the ground of individual rights meets too often with skeptical indifference or a laggard response, or society at large and individuals in particular unconsciously defend their own imagined selfrighteousness and integrity by dismissing the problem as a sentimental impossibility, accepting the criminal as a criminal and there's an end of it. Even those who are roused to the existence of the problem too often lose sight of the practical possibility of turning out of our penal institutions "not model prisoners, but decent citizens."

Therefore, Glueck [Concerning Prisoners: Bernard Glueck, *Mental Hygiene*, April, 1918] opportunely strikes the balance up to the other side of the proposition. What is society, what is the self-sufficient individual doing or going to do as protection from the menace of the criminal returned to society from these penal institutions? Leave

ing aside all ethical questions of responsibility to the prisoner, concern for his individual welfare, is it reasonable and sound policy merely to inflict upon him, whatever his offense and whatever his incapacity for a social life among law abiding citizens, a temporary season of restraint and a social retaliation for his injury to society, and then permit him to go free with a liability to offend again?

Glueck presents in full several histories of inmates of Sing Sing prison, with graphic charts of mental and physical status and periods of detention in various reformatory or penal institutions. These are a few of the approximately five hundred thousand persons who pass out of these institutions annually to resume their lives in the community at large. The question vital to society is this: Have they become through imprisonment better able to take their place among law abiding citizens, or are they still a menace to society? If the latter be true, of what permanent use to society do these institutions prove, and why is society not alive to their real possibilities?

More than half of the cases upon which the study is based manifested some form of nervous or mental abnormality, by which their behavior had in some way been affected. Recidivism was very largely in evidence in these groups. Sexual offenses also, socially so important, existed largely in this class. The case histories quoted are illustrative of an enormously large percentage of these mentally defective, mentally diseased or deteriorated, or psychopathic, a group which stands anywhere between the normal and the positively mentally diseased. These have come in a very large percentage of cases under the control of reformatories, or under earlier observation at school in regard to mental and moral deficiency and various delinquencies, which have also been recognized by parents, and then later they have passed under the eye of the law. All these have been blind to the possibility and the necessity for society's sake of inquiring into the causal factors at work and of attacking the problem of the anti-social and criminal tendencies growing more and more manifest, with a view to a real remedy. At the most, "treatment has been directed to an attribute of the diseased personality and not to the personality as a whole in its relation to the environment." Even though a medical estimate of the case had been made at the reformatory, means were lacking to turn that knowledge into a constructive program of improvement. Like the schools and other institutions, lack of facilities for

attacking the problem has necessitated a simple turning of these individuals loose again upon society. Periodic sentencing to prisons for definite terms has also merely considered the deed and neglected the far more potent factor of the criminal back of it.

A constructive remedial program consists first in the breaking through of the fixation of legalistic traditions to include a broader survey of the problem. This would mean a scientific study of each individual prisoner by the court as a basis for judicial and correctional procedure, necessitating the establishment of a system of psychopathic clinics in connection both with the criminal courts and the State penal institutions. It would further involve the adoption of some constructive organization of the prison curriculum for the actual betterment of the men during their sojourn, and all this the writer believes can be best accomplished through the co-ordination of the various means and activities presented in penal and reformatory institutions, always keeping in mind the human and spiritual values at stake rather than making paramount the strictly formalistic and material activities and interests of these institutions. This procedure is already being set afoot through the construction of the new Sing Sing prison as a general receiving station and clearing house for the State, but it needs the intelligent, awakened cooperation of society, and, particularly, aid through the legal and medical professions.

ESTIVAL MILIARY ERUPTIONS OF WARM CLIMATES.

The estival cutaneous miliary manifestations may be conveniently classified into two groups, namely, miliary eruption properly speaking and sudoral pyodermatitis. The miliary eruption occurs on the trunk, neck, forehead, and flexor aspect of the limbs. The minute vesicles are surrounded by a congestive rosy areola, at times by small erythematous papules. Their liquid content is clear, but may become purulent. The evolution of the process is rapid and, in most cases, only gives rise to slight pruritus.

Pollitzer maintains that the vesicles are due to a dilatation of the sudoriparous excretory ducts, while others consider them the product of epidermic colliquation.

Heat is the principal factor of sudoral pyodermatitis, but dampness also plays a large part by hindering evaporation of the sweat and by facilitating its stagnation on the skin. The affection is common in Algeria and Madagascar, also the West Indies.

In France the eruption is more common in children and nearly all the subjects offer some organic defect which lowers their vital resistance; scrofula, tuberculosis, alcoholism, diabetes, arthritis, or hepatic insufficiency are found in their antecedents. Digestive disturbances are often noted, such as gastric dilatation, constipation, diarrhea, fetid stools, and acute or chronic gastroenteritis.

The elements of the eruption are composed of numerous miliary vesicles forming hypodermic or dermic nodules of various sizes. They affect the form of nonsuppurating tubercles or suppurating papulopustules, or papulotubercles. The tubercles are small productions, slow in evolution and usually infiltrate the deeper strata of the dermis or more rarely arise in the subcutaneous connective tissue. The tubercle is oval, distinctly circumscribed, and varies in size from a lentil to a split pea. The skin is slightly erythematous around them and they are only painful on pressure.

In the papulopustular type the primary element is papular, and a pustule, usually dermic than epidermic, becomes grafted upon the papule. The pustular papulotubercles project quite markedly above the cutaneous surface. Their base is hard, but their apex is softened, fluctuating, and bright red, revealing a purulent collection through the thinned and tense skin. In the axilla, sudoral polydermatitides form small tumors which either undergo resolution or by contracting adhesions with the skin form abscesses the size of a walnut.

These divers lesions when left untreated may last for some time. If the tubercles do not suppurate they remain indurated and slowly disappear within four or five weeks. The other elements suppurate without elimination of a core. But other nodules may develop if the patient continues to perspire freely or if his hygienic conditions are not improved.

When the affection is treated its evolution is about a fortnight. Although quite similar in aspect to furunculosis, the eruption of sudoral polydermatitides differs totally from the viewpoint of evolution, because when properly treated they are quickly cured.

The commoner complications are the result of scratching and the want of cleanliness. By scratching, the patient inoculates other skin areas and the result is the production of large excoriated and ulcerated surfaces, true dermatitides which undergo eczematization and impetiginization. An antiseptic treatment soon gets the better of the lesions.

Among other less frequent complication is alopecia of the scalp following sudoral polydermatitis of this region. Brocq considers that in this alopecia the peripyodermic areas are depilated by a toxin secreted by the yellow staphylococcus. The lesion is not permanent; the hair grows and only a small bald spot remains at the site of the opening of a folliculitis.

The treatment is simple, consisting of bland antiseptic applications and proper hygienic treatment of the skin. If the subject is anemic, a tonic will be advantageously prescribed and a change of climate may be indicated.

DUPUYTREN'S FRACTURE.

In almost all instances of Dupuytren's fracture a diastasis exists, but it is often unrecognized on inspection and difficult to detect in a radiograph. When not corrected, the diastasis favors secondary deviations by permitting an abnormal mobility of the astragalus and by operative interference only can the defect be recognized and reduced.

Backward displacement is occasionally not apparent and, although usually present, is hidden by the edema. It is logical to reduce it by forced adduction before reducing the astragalus into the space that is occupied by the superior articular surface of this bone. If this be neglected, not only will adduction be useless, but all types of ulterior displacement are possible, particularly equinism, which is the first step in their production. The fact that the foot was in forced flexion at the time of the abduction should lead one to suspect lesions of the astragalus and therefore prefer the open method of reduction. Dupuytren's fracture is not of necessity reduced simply because the foot has been straightened on the leg, and in this case the fracture has only been reduced in appearance. The movement which brought the foot into adduction may very well have taken place in the astragalocalcaneal joint or mediotarsal joint, the astragalus having in no way contributed, or only slightly so, to the adduction. A radiographic examination of certain fractures considered as reduced shows that the astragalus does not fill the space allotted to it, and that an empty space exists between the two surfaces which should be in intimate contact. If the focus of fracture be not exposed by incision and directly treated, it is only by radiography that a complete reduction of Dupuytren's fracture can be ascertained to exist from the fact that the astragalus is in its proper place and the diastasis, which is always present, has been corrected.

It may be logically assumed that the majority of so called secondary deviations following reduction are only primary ones which were overlooked in fractures which have been reduced only in appearance. Many eminent surgeons maintain, however, that secondary displacements, after real reduction, do exist, but it is probable that they are the exception.

The treatment of the callus is a late reduction, and, as in primary reduction, the principal aim is to bring the astragalus into its normal position. If there are not sufficient intrarticular obstacles to prevent the proper reduction of the astragalus, the resulting defective callus will be extrarticular. If the contrary conditions exist, the result will be an intrarticular callus. Extrarticular callus of the exuberant type offers a relative mobility of the foot, and with only a slightly angular valgus, an invisible diastasis, and a slight intermalleolar spreading. The treatment for these cases is a bilateral oblique linear osteotomy with or without resection in the line of the fracture, but if the callus is very big an oblique linear osteotomy of the fibula, followed by cuneiform osteotomy of the tibia, is indicated. The intrarticular callus causes more deformity, the foot being unmovable in valgus, while the intermalleolar spreading is occasionally very apparent. These cases are to be dealt with by oblique linear osteotomy of the fibula with or without resection, according to the degree of the angle present, and an arthrotomy sufficiently free to reach the obstacle by cutting through the base of the internal malleola. These steps are followed by a more or less complete and varied resection according to the conditions present in the given case.

There is a logical progression in the steps of the osteotomy, and it is the state of mobility of the foot which indicates the cessation of such or such step in the interference. The most delicate time of the operation is after osteotomy of the fibula, when, the mobility not being obtained, one must decide between a cuneiform osteotomy of the tibia and a real resection of the joint. It may very well happen that the former will only bring about an artificial correction of the foot from the fact that an intrarticular callus subsists with a displaced astragalus. Thus can be explained the recurrences which have been known to occur after cuneiform osteotomy of the tibia, because it was an incomplete interference, when in reality a resection of the joint should have been done.

Some surgeons think that, in cases where doubt exists, a resection is surer, and we consider it indicated in the majority of cases of old callus.

WANTED, A DEAPPETIZER.

The rich man will often take a great amount of exercise in the open air "to get up an appetite," and will come in from riding, golf, or walking to announce triumphantly that he is "as hungry as a wolf." Even in war time, though deprived of much, he still has enough food, often too much, for his physical needs.

Meanwhile the hordes of young workers who sweep, hungry and hurried, into the eating places at noon, requiring no Hoover injunction to "leave a clean plate," because there is never enough on it to stay their youthful stomachs, will have read with interest in the daily papers that a German has discovered a drug to still hunger; not to kill it, but to keep it in subjection until the next meal. Sadly enough, there are many who would gladly avail themselves of it, as they regard their stomach simply as an "aching void" demanding to be filled. They say with Trotty Veck in *The Chimes*, that "There is nothing more regular in coming round than dinner time, and nothing less regular in coming round than dinner." A London factory girl recently refused to see a doctor when ill, in case he should give her a tonic, and what, she asked, was the use of that unless he meant to give her money to buy food? She was like the woman who heard someone say that eating between meals took away the appetite for food at stated times. The remark came as a suggestion to be eagerly acted on. She would eat a little of her scanty food at four o'clock and so avoid being hungry for supper. Supper time came. She was not hungry, but at nine o'clock had to get out of bed and eat more than she usually did at seven.

There are four rations in the American army, the last being the "emergency" ration, sometimes dubbed the "substitute for nothing," but supposed, like the German's discovery, to still the pangs. A satisfactory one has not yet been found by the authorities; the British Tommy takes in his belt and takes out his pipe; the British working girl often finds a fresh bun and a glass of water "very filling at the price," but, if food prices continue to go up, the suggestions of chemists, German or American, with regard to hunger stillers, will certainly receive eager attention from all.

NIGHT BLINDNESS.

Those who think criticism means faultfinding, and are constantly criticising the Army Recruits Examining Board, are not in the least aware that there are many invisible defects which even a close questionnaire cannot elicit, simply because the man does not know that he is abnormal and only finds it out some time after he has joined the army. This is paralleled by the number of persons who have found they were defective in sight or hearing only since tests became a matter of routine in taking a case history. The difficulties in diagnosing, or, rather, affirming night blindness (hemeralopia) in a soldier are so well drawn by a French confrère, Doctor Magitot, that we quote him here:

"His hospital ticket says: 'Complains that he cannot see at night.' The soldier annexed to this ticket is a strong young giant of thirty-eight, a truck driver. He has an eight days' growth of red beard full of dust and sits awkwardly in front of the reading tests on the wall,

but he reads perfectly, even the small type; he does not seem ill, and the examination reveals no optic abnormality. 'Another one trying to cut the night corvées,' mutters the wounded convalescent who is acting as reporter, and in fact he is the eighth or tenth we have had within the last week from the central hospital."

In spite of the variety of causes, it seems difficult to account for so many cases. Unhealthy life in the trenches; an almost exclusive meat diet; attacks of enteritis, may all help to develop it. Chronic ethylism, unfortunately so common, is a powerful factor, also great fatigue, want of sleep, and alcoholism; this last cause may partly explain why most cases occur in men from thirty-five to forty-five. From old accounts of the disease it seems to have been common during a siege, a time when men are anxious and ill nourished. Jacques de Vitry, who wrote of the fifth crusade, says that the people of Damietta, during the siege, suffered greatly from night blindness, which seems then to have assumed an epidemic form, and Lavron, a Russian doctor, who investigated its causes in 1898-1903 in the government of Samara, also found it epidemic.

The army doctor cannot dismiss the cases as fraudulent. He finds that a week in bed, milk diet, diuretics, soon set the man right; meanwhile the specialists are studying the cases diagnosed as nephritic or hepatic hemeralopia, and looking for albumin and biliary pigment.

MILITARY HOSPITAL TRAINING FOR NURSES.

Some months ago, in commenting on the insufficiency of trained nurses for service in the army, we proposed that the nurses needed should be trained in the army hospitals. This plan was at first opposed, but recently the Secretary of War has authorized the Surgeon General of the Army to establish an army school of nursing with branch training schools in the various military hospitals throughout the United States. It is proposed that the method of instruction shall be based upon standards which have been found desirable, and have yielded the best results in the operation of civil hospitals so far as relates to the care of the sick. The proposed army school of nursing will offer a course leading to a diploma in nursing, provided the military hospitals continue in operation for the full period of the course as now planned. Should hostilities cease, and the army hospitals be discontinued before the end of the full period, the authorities will issue a certificate entitling the student to credit in the civil hospitals for the amount of instruction received and for the performance of service in the army school of nursing.

Only those women will be admitted who are between the ages of twenty-one and thirty-five, and who have had a high school education or its equivalent, and who present evidence of physical and moral fitness. Several schools will be begun at once in the military hospitals. Application for entrance into these schools, may be sent directly to the Army School of Nursing, or to the Office of the Surgeon General of the Army, Washington, D. C.

The need for nurses becomes more and more apparent as the troops leave for the front. Every

division which is sent over, carries with it four fully equipped base hospitals in addition to the field stations, each of which must have its proper supply of nurses. The small reserve of nurses in the Medical Department has already been exhausted, and they are being taken from the camps, cantonments, and civil hospitals. Trained nurses are urged to apply for duty, and those who are suitable and have the necessary qualifications, will be promptly assigned to active duty by the Surgeon General.

We are pleased to see that the suggestion which was put forth by us some months ago, has been adopted by the Surgeon General, and we look forward to excellent results in the army hospitals, where the student nurses will be of much help to the trained nurses under whom they will serve during their tutelage.

News Items.

An American Hospital in Windsor Park.—The joint war committee of the British Red Cross and the Order of St. John has presented to the American Red Cross a fully equipped hospital of 500 beds, which is to be erected in Windsor Park by permission of King George.

Enlisted Chemists for Special Duty.—The War Department has notified all camp and cantonment commanders to report to the Adjutant General's Office the names and qualifications of all graduate chemists in their commands, with a view to having them assigned to chemical work.

U. S. Naval Hospital in London.—Alford House, Park Lane, London, has been turned over to the American Red Cross for use as a naval hospital by Mrs. Frederick Edward Gest, formerly Miss Amy Phipps, daughter of Henry Phipps, of Pittsburgh. This is one of the finest residences in London, occupying an entire block, with an ample lawn and a roof garden. This is the twenty-fifth institution established by the American Red Cross in England.

Women in Army Medical Corps.—The Committee on Public Information, Division on Women's War Work, announces that two women psychologists have been appointed to the Army Medical Department at Washington, Dr. Mabel Fernald and Dr. Margaret Cobb. According to Major R. M. Yerkes, of the Psychological Division, trained women can be used for the highly specialized work of handling the army reports and may eventually be called upon to assist with work in special hospitals dealing with cases of reconstruction.

Cloth for Officers' Uniforms.—The director of operations for the general staff of the army has issued instructions that all cloth for uniforms for officers must be purchased from the Quartermaster's Department and conform to the army requirements. This cloth will be furnished at cost. Samples will be provided by all local quartermasters. Contract will be made with tailors to make uniforms for officers, and officers who avail themselves of such service will be charged the contract price paid the tailor. Where the officers prefer it they may have the cloth made up by private tailors, but in any event the cloth must be purchased from the quartermaster. This will effect a material economy in the cost of officers' uniforms.

Hospitals Appeal to the President.—At a recent meeting of the hospital authorities in the city of New York, a resolution was adopted asking President Wilson to take such action as may be necessary to preserve the hospitals of the country from the further disruption of their organization and the abandonment of their indispensable tasks. This protest applies not only to the medical and nursing staff of the hospitals, as engineers and other trained men are being taken away by the draft. The following committee was appointed to prepare and present some definite plan for obviating this difficulty: Dr. S. S. Goldwater, of Mount Sinai; Dr. Robert L. Wilson, Department of Health; Rev. Dr. George F. Clover, St. Luke's, and Charles B. Grimshaw, Roosevelt Hospital.

Medical Officers Must Take Leave of Absence.—The Secretary of War has sent in a memorandum to the Surgeon General of the Army directing that all officers of the higher grades who have been on active service continuously for six months, at their desks on department business, shall be required to take two weeks' leave in a manner which would least interfere with the operation of the department. The secretary fears that without such leave the vitality of the officers might be lowered.

Detention Camps Needed.—Notwithstanding the fact that the Medical Department of the Army has recommended the establishment of detention camps where all men joining a command may be segregated for observation as to possible symptoms of infectious diseases, the recommendation has not yet been put into effect. In commenting on this fact the *Army and Navy Journal* says: "Unless something is done to provide for these detention camps at the camps and cantonments at once, it is feared that the experiences of last autumn and winter will be repeated in the matter of prevalence of communicable diseases among the men entering the service from civilian life."

Civil Service Examination for Medical Examiner.—The Municipal Civil Service Commission announces an examination for Civil Service examiner (medical), for which applications will be received until July 31, at 4 p. m. Candidates must be citizens of the United States, residents of New York State, at least twenty-five years of age, must be licensed to practice medicine in the State of New York, and have had one year's service as intern in a general hospital or five years' general practice, or two years' professional work with duties similar to the duties of this position or the equivalent. For further particulars apply to the Municipal Civil Service Commission, New York.

American Climatological and Clinical Association.—The thirty-fifth annual meeting of this society was held in Boston, June 24 and 25. Dr. Guy Hinsdale, of Hot Springs, Va., for many years secretary and treasurer of the society, was elected president, to succeed Captain J. H. Elliott, Medical Corps, U. S. Army. Dr. Joseph H. Pratt, of Boston, was elected first vice-president; Dr. Hugh M. Kinghorn, of Saranac Lake, second vice-president; Dr. W. Dufield Robinson, of Philadelphia, reelected recorder; Dr. Arthur K. Stone, of Boston, secretary and treasurer. The time and place of the next meeting will be decided by the executive committee of the Congress of American Physicians and Surgeons.

Personal.—Henry Drysdale Dakin, the chemist, who, in collaboration with Dr. Alexis Carrel, devised the Carrel-Dakin method of treating wounds, has received the honorary degree of Doctor of Science from Yale University.

Justice William R. Riddell, Judge of the Appellate Division of the Supreme Court of Ontario, Canada, who has contributed many important and interesting papers to the *Medical Record*, has received the honorary degree of Doctor of Laws from the Wesleyan University.

Dr. George Wharton Pepper, formerly provost of the University of Pennsylvania, has received the honorary degree of Doctor of Canon Law from Trinity College.

Dr. Walter B. James, president of the New York Academy of Medicine, has received the honorary degree of Doctor of Medicine from the University of Pennsylvania.

Eighty Per Cent. of Wounded Returned to Service.—The Surgeon General of the Army announces that eighty per cent. of the wounded, who formerly remained at the hospitals, have been returned to active duty in three or four weeks. This improvement

American Expeditionary Force are immediately communicated to the Surgeon General, who disseminates the information among the members of the medical department through classes, motion pictures, and pamphlets. Since last October more than 150 officers have received special instruction at the American Expeditionary Force Medical Institute; four classes at Bellevue Hospital, New York; two at the University of Pennsylvania; one at Philadelphia; one at Rochester, Minn.; one at Pittsburgh; Chicago; New Orleans; and San Francisco.

THE AMERICAN MEDICAL ASSOCIATION

Sixty-ninth Annual Meeting

Held at Chicago, June 10 to 14, 1918

THE medical man is destined to play a rôle of increasing importance in the great struggle to which we are committed. It is he who must determine the fitness of our men for the arduous duties which confront them, who must keep our men in health, who must heal them of their wounds and diseases, and who must restore the halt and the maimed to industrial independence in the communities to which they will return. The realization of the tremendous responsibilities which confront every patriotic physician made the sixty-ninth annual meeting of the American Medical Association more soberly earnest and serious than any session of recent years. Every one in attendance was deeply impressed by the overwhelming enthusiasm manifested by the audiences at the general meetings—audiences including many laymen who came to see what our profession was doing to help to win the war. The topics considered in the following abstracts of papers presented, as well as our report printed last week, show, in the subjects treated, the predominating influence of the war.

(Continued from page 1152)

The Scientific Proceedings

SECTION IN PHARMACOLOGY AND THERAPEUTICS.

The Chairman's Address—On the Teaching of Pharmacology.—ARTHUR D. HIRSCHFELDER, professor of pharmacology in the University of Minnesota, made a plea for the bringing of the teaching of pharmacology closer to clinical medicine in order to reduce the student's difficulty in grasping, assimilating, and remembering facts. He believed that this could be accomplished by a combination of several methods of study. By teaching the student to observe accurately the effects of certain drugs upon himself and his associates, which would also lead to the impression upon his mind of some of the important lessons in the science of dosage, much of great value could be accomplished by arousing his interest and awakening his powers of accurate observation. In animal experimentation for the demonstration of pharmacological actions much could be accomplished also by reproducing in the animals used some of the pathological conditions for the relief of which the drugs are given to man. Further valuable gains would be made by the adoption of a simpler technic of the experiments, and where possible, letting the students observe on the exposed organs themselves the influence exerted by the drugs under study. This was preferable to letting them enclose the organs in recording instruments and then subsequently analyzing the records to translate them into terms of altered activity produced by the action of the drug. This plan would further advance the student by giving invaluable training in the powers of accurate observation. The didactic side of the instruction could be made of greater interest and value by laying much emphasis upon pathological physiology and by teaching the student to seek out the targets at which to aim his therapy. The basic relations of chemistry to pharmacology should not be neglected, but here the teaching would be more effective if simplified and if attention were directed specially to the reactive groups of a chemical compound than to the molecule as a whole. Finally we should ensure an immediate

acquaintance with some of the original literature by having him prepare abstracts in good form of several of the classical papers on the actions of individual drugs.

Pharmacology in the War.—Prof. TORALD SOLLMANN, of the Western Reserve School of Medicine, pointed out that the war had forced every form of human endeavor to the supreme effort to meet and defeat, not only the human enemy, but also the forces of nature. He then went on to touch upon some of the parts played and to be played in the combat by pharmacology and therapeutics, and especially what our own country had done and could do. By way of illustration, attention was called to the advances which had been made in the discovery and application of antiseptics by Carrel and Dakin, both closely associated with America, and to the newer acridin dyes and the new mercury compounds introduced by Schamberg. The life saving use of magnesium, introduced by Meltzer, where the prophylactic use of tetanus antitoxin could not be ensured was also mentioned. The American contributions to the use of safe anesthetics were largely responsible for the adoption of nitrous oxide. The introduction of flame and gas warfare had led to many discoveries such as the use of wax films for the treatment of burns. And in this connection it had been shown in America that there was no need for the secret complex foreign preparations, since simple paraffin was in every way as valuable. Nothing, further, could be expected from the addition to it of antiseptics—also an American contribution. The shortage of many drugs for which we had depended upon Germany also led to several very valuable advances in therapy by making it necessary to revert to a more restricted materia medica with much profit, since it was found that many of the new drugs could be spared with no loss and often with material gain. Thus many unnecessary products were weeded out, and needless overdrudding was cut short at a stroke. The shortsightedness of our own patent laws was also made manifest, and the emergency legislation which was made necessary should teach us to make more permanent preparation to insure against a repetition of our manifold difficulties in supplying many of our legitimate needs.

The Problem of the Synthetic Drug.—Prof.

JULIUS STIEGLITZ, of the University of Chicago, and chairman of the Committee on Synthetic Drugs of the National Research Council sketched some of the lessons taught in this field by the war and indicated some of the ways in which we had risen to the solution of the many problems presented by the cutting off of our European supplies. The greatest lesson which the severance of the supply had taught was how very few of the synthetic drugs were vitally important to us. By far the most important were found to be arsphenamin, procain, barbital, atophan, and luminal. Others of value could be mentioned, but these were the only ones of real major importance. He said that the question could be asked, How are we now meeting the demand for these vitally important synthetics? The one, probably, of greatest importance—arsphenamin—was now being produced in this country, largely through the efforts of Schamberg and his associates, in decidedly better quality than the original German product. Further, the production was in such great abundance that soon the output for one month would equal a whole year's supply as provided before the war. Finally, the cost was reduced to \$1 to \$1.50 per dose, as compared with \$3.50 for the same amount before the war. In respect of this synthetic we had not only met the problem, but had actually gained much over our pre-war status in both quantity and quality of the drug and in its cost to the patient. American practitioners should be willing to cooperate in these endeavors and set aside their own convenience. In other words, they should be willing to use the superior arsphenamin, even if less convenient, rather than seek the neoproduct which was not yet made in America. In this connection it was mentioned that this or a superior product—sodium arsphenamine—could shortly be expected. The status of the other synthetics was also discussed and it was stated that the production of procain and phenylcinchonic acid (atophan) was approaching all our needs. The case with barbital (veronal) and luminal was not yet so favorable, but there was good promise of ultimate success. In many of the cases the American production of these and other synthetics had been made possible only by the most public spirited sacrifices on the part of the manufacturers. The subjects of licensure and provision for the future on a more permanent basis were also discussed.

Impregnation of Underwear as a Means of Controlling the Clothes Louse.—Prof. WILLIAM

MOORE, of the University of Minnesota, reviewed the problem of attacking the clothes louse and pointed out the difficulties associated with its adequate solution. After much investigation he had been reduced to the study of the value of impregnation of the underwear with oil; with oils containing toxic substances; with the toxic substances alone; and with certain inorganic chemicals. The impregnation with various mineral, animal or vegetable oils in quantities small enough to permit the clothing to be worn met with little success. The use of oils containing a large variety of toxic substances gave better results in some cases, but a large number of the substances tried were found to be worthless, or practically so. About the only ones which had

any decided value were valeric acid, iodoform, crude anthracene, diphenyl, alpha naphthylamin, ortho-nitranilin, heliotropin, creosote, and tricresol. Of all of these chemicals the one which gave the greatest promise proved to be heliotropin or piperonal, which retained its killing power for more than 500 hours. This preparation was also not disagreeable to use. It was found that the substance to be used must fall within certain fairly narrow limits with respect of its volatility to be worth even a trial, since, if too volatile its action was too fleeting, while if not volatile enough its destructive power was low. The various inorganic chemicals tried all fell far below either heliotropin or creosote in value and many were inert. It was further found that the choice of the solvent for the heliotropin was of great importance, for if it was too readily diffusible the power of the impregnation was lost rapidly through the spread of the oily solution throughout all of the clothing and the consequent reduction of its concentration. Apparently the best results so far secured were obtained with a solution of heliotropin in cocoa butter. The strength and mode of preparing this mixture were given.

The Civilian War Ration.—**PAUL ROTH**, of Battle Creek, presented a brief survey of a study of the effects upon the physical well being of healthy persons which resulted from the prolonged use of a very limited food intake. He said that the work had been done under auspices of the Carnegie Institute, of Washington, which would soon publish full details. The investigation was carried out upon a considerable group of normal young men, and consisted in a primary reduction of their food intake sufficient to bring about a rapid reduction in their body weights amounting to about ten per cent. The diet was then regulated so as to maintain the reduced weight and to prevent further loss over a period of about four months. During this experimental period metabolic studies were carried out upon the men individually and in groups, and their capacities and responses to physical exertion were carefully determined. It was found that the normal requirement prior to the period of study had amounted to an average of about 3,400 calories per day per man. During the experimental period some of the men were able to get along for several weeks without material disturbance on as little as 1,400 calories per day. In the general series of experiments the heat output was found to have been reduced by almost twenty per cent., indicating a reduction in the level of metabolism. During the initial period there was considerable nitrogen loss, which ceased almost immediately upon the commencement of the period. The temperatures of the men remained about normal, though the surface temperature was somewhat reduced and many complained of feeling chilly. The systolic and diastolic blood pressures were materially reduced and the pulse rate often showed a striking reduction. The men appeared decidedly emaciated, but it was striking to observe their almost normal capacity for strenuous, and even sustained, physical exercise. These studies indicated the harmlessness of the adoption by civilians of greatly curtailed diet as a war measure, should such become necessary. Many in England are already benefitting from a restricted diet.

The Rôle of Antiscorbutics in Our Dietary.—

ALFRED F. HESS, of New York, pointed out that foods might be classed as essential and nonessential, depending upon whether or not they were necessary for life and normal growth. He thought that one of the essentials among the food factors was that which prevented the development of scurvy, but he was unwilling to classify this food factor, for there was doubt as to whether it should be regarded as a vitamin, a true food substance, or merely as a catalyzer of the food stuffs. The important point, however, was to recognize its existence in some foods and its absence from others. He pointed out that we had little knowledge regarding the action of this food factor and equally little with respect to the amounts required to prevent the development of scurvy. In his discussion of the origin of scurvy he brought forth evidence to show, contrary to the views of McCollum and his associates, that the disease was definitely due to the deficiency of this unknown substance in the dietary and constipation did not play an essential rôle in its production. He emphasized the fact that we knew little about the abundance of the supply of this antiscorbutic material available for the different peoples of the world, but indicated that there was good reason to believe that the supply was decidedly limited. He called attention to the pronounced antiscorbutic value of potato, but laid especial stress upon the juice of the orange. In this connection he cited many of his own observations to show the prompt control of the disease by the administration of small doses of orange juice by mouth and also brought forth the fact that the boiled and strained fresh juice could be given intravenously in fairly large doses with safety and with prompt alleviation of the disease. He also mentioned the successful use of an aqueous infusion of orange peel, and urged the economy of utilizing such a product, since the cost of oranges had risen so greatly.

Acute Bichloride of Mercury Poisoning Treated by the Newer Methods.—

JACOB ROSENBLOOM reported a case of severe acute poisoning by a large dose of bichloride of mercury, in which treatment was not begun until seven hours after the ingestion of the poison, but in which recovery followed the use of several of the newer methods of treatment. That employed was the prompt administration of white of egg beaten up in milk, followed by gastric lavage. Three hundred mls of a 1:500 solution of calcium sulphide solution were then given orally and subsequently the stomach was washed with the same solution. Then 0.36 gramme of sodium phosphite and 0.24 gramme of sodium acetate were given by mouth, or a solution of sodium hypophosphite in water and peroxide of hydrogen could be given in the proportion of ten times as much hypophosphite as of mercury taken. This latter should be repeated at intervals of eight hours. An abundant lavage with this latter solution should also be given, followed by a solution of sodium sulphate and calcium sulphide to be left in the stomach. About 600 mls of blood should be withdrawn and about 800 mls of Fisher's solution or a solution of glucose and sodium bicarbonate should be injected. The stomach should be washed twice daily, followed by the oral administra-

tion of 0.3 gramme of calcium sulphide in ninety mls of water, and this part of the treatment should be continued until the stomach washings were free from mercury and the urine no longer contained any of the poison. The purpose of each of these measures was discussed.

Sounds Heard in the Auditory Method of Measuring Blood Pressure; Mechanism of Production; Significance.—Dr. CLYDE BROOKS, from the Ohio State University, presented a paper giving the results of an intensive study of the sounds heard during the auditory measurement of blood pressure, also an explanation of the mechanism of the production of the sounds, an explanation made possible by the previous work of Brooks and Luckhardt. (*American Journal of Physiology*, 1916, volume xi., page 49.) These sounds are not as previously described by Korotkow and, later, by others.

When the arm cuff pressure is raised to a high point and then gradually lowered the following sound phases are heard:

- Phase 1. Silence.
- Phase 2. Murmurs.
- Phase 3. Arrhythmic snapping sounds or "thumps."
- Phase 4. Rhythmic snapping sounds or "thumps."
- Phase 5. Friction sounds, or nozzle sounds. "thump-sh-sh."
- Phase 6. Rhythmic snapping sounds or "thumps."
- Phase 7. Murmurs.
- Phase 8. Silence.

These eight sound phases are formed by only three sound elements plus the absence of sound, or silence. The three sound elements concerned are: Murmurs; snapping sounds; and friction sounds. The formation of the phases is shown by the accompanying diagram. It is found that the beginning of regular rhythmic snapping sounds, or the beginning of the fourth phase is the best criterion for measuring the systolic blood pressure. This does not give the actual systolic pressure, but it gives the pressure plus the arterial resistance, which is a valuable clinical finding. The criterion for measuring the diastolic blood pressure is the lowest point where snapping sounds can be heard, or the point where they disappear, or the end of the sixth phase or the beginning of the seventh phase. This does not give the actual diastolic pressure, but it gives that plus the pressure, just sufficient to completely collapse the vessel, which is a valuable clinical finding. The auditory method of reading blood pressure is superior to the palpatory method or the sphygmographic method involving the use of such machines as the Uskoff or the Erlanger apparatus.

SECTION IN DERMATOLOGY.

Duties of a Dermatologist.—Dr. H. H. HAZEN, of Washington, D. C., chairman, suggested that medical societies, particularly special societies, assume greater leadership in medical work by becoming the source of authoritative knowledge to further the information of general practitioners. Still more important was the duty of formulating lay opinion and instruction. He indicated that, in the future, Americans would depend less upon European medical

centres and declare their independence by building up American medicine. A caution was given against drawing too heavily upon the community physicians for war purposes, for, if this were done, civilians would suffer and medical instruction decline.

Cutaneous Tuberculosis. A Survey.—Dr. SIGMUND S. POLLITZER, of New York, in reviewing cutaneous tuberculosis as a whole, pointed out the scope of the subject and historically outlined the concept of tuberculides of toxic origin versus bacillary tuberculosis. He considered the only absolutely diagnostic point in tuberculosis to be a demonstration of the bacilli. In classifying tuberculosis of bacillary origin, he pointed out that what were generally called tuberculides were not yet proved to be related to tuberculosis.

Sarcoids and Erythema Induratum of Bazin.—Dr. S. F. SWETZER and Dr. H. E. MICHLESON, of Minneapolis, reported in detail a study of the relation of sarcoids and erythema induratum to each other. Histologically the two conditions were similar, in fact almost identical, which fact was particularly brought out in the report of a case.

The Venereal Disease Problem in the Army.—Dr. WILLIAM A. PUSEY, of Chicago, praised the work done and being done in the army and illustrated how venereal diseases were being controlled prophylactically. The means used were the regulation of prostitution near points of military concentration; prophylaxis at the base hospitals after exposure, and punishment of offenders who did not report incontinence and became infected. Doctor Pusey said that venereal disease in the army was less than ninety per 1,000 per year and means would be taken after the war to prevent infected soldiers from being introduced on the public.

Syphilis and Venereal Disease as a Public Health Problem.—Dr. HARRY G. IRVINE, of Minneapolis, presented a careful exposition of the importance of controlling venereal disease, showing that, by control of prostitution, prophylaxis, and the proper inspection of our soldiers the disease could be kept under control in the army, such measures being equally effective with the civil population. His statistics were most encouraging.

Pemphigus: A Clinical Study.—Dr. HERMANN GOLDENBERG and Dr. WALTER JAMES HEIMANN, of New York, offered no conclusions in this paper based upon research upon this subject, but only their results in clinical experience with thirty cases recently treated in the wards of Mount Sinai Hospital. Pemphigus vulgaris was seen in twenty-two of the thirty, and the rarer forms, either alone or associated, in the remaining eight. All of the cases excepting three died directly of the disease. Of these three, one had committed suicide and the other two were at the point of death. Seventeen of the thirty died within the first six weeks, seven more within the next four months, three between the eleventh and eighteenth months, but one had survived two and a half years. The exact cause of death could not be determined, but it was either due to asthenia or to pulmonary edema. In the two cases autopsied, nothing was found. With one exception, the patients were Jews, and in eighteen cases the initial lesion was in the

mouth and, in five more, near the mouth. There was a slight leucocytosis and polymorphonuclear leucocytosis in over one half of the cases and the majority were afebrile. It seemed to the authors that, inasmuch as the disease started with what was apparently an initial lesion, and, after a period of incubation, became disseminated, and inasmuch as there was no evidence of metabolic disturbance, the condition was due to an undiscovered infection. No therapy was of avail. The lesions capriciously disappeared and returned without reference to treatment or to its interruption. Nothing definite was known of the disease except that it was invariably fatal and had certain features which would suggest its infectious origin. The authors categorically advanced the definition that diseases resembling pemphigus which were not fatal were actually not pemphigus.

Toxic and Bullous Drug Eruptions and Bullous Erythemas.—Dr. DAVID LIEBERTHAL, of Chicago, described in detail the various toxic substances and drugs capable of producing bullous lesions which might be confused with those of pemphigus or dermatitis herpetiformis, clearly outlining those conditions in which such confusion was impossible. His views on the pathogenic mechanism of these conditions should warrant a careful reading of his paper when it appears.

Unusual Forms of Epitheliomas of the Skin.—Dr. LLOYD W. KETRON, of Baltimore, reported three cases of basic celled epitheliomas which clinically did not suggest malignancy. They were very superficial, suggesting in appearance infectious eczematoid dermatitis more than anything else. However, a superficial interrupted, slightly rounded, pearly margin gave the clinical clue to the observer. Histologically, besides the early basal cell growth, a strikingly large plasmomatous infiltration was seen.

Rôle of the Vegetative Nervous System in Certain Skin Diseases.—Dr. EDWARD H. REEDE, of Washington, D. C., presented a communication full of valuable detail. His study was based on the fact that the endocrine glands receive and dispatch impulses through the vegetative nervous system; consequently, disease of this vegetative nervous system was constant in disease of the endocrine glands. Endocrinopathies arose in response to toxic, metabolic, and effective stimuli, their appearance being divided by the infantile, adolescent, or adult periods. The nutrition, pigmentation, circulation, and secretion of the skin was profoundly influenced by the vegetative nervous system. Changes in the skin offered important evidence of increased or decreased action of the thoracolumbar or sympathetic, or of the craniosacral or autonomic division of the vegetative nervous system, the significance of which changes being too frequently overlooked. In some cases, specific disturbances originating in thyroid, gonad, suprarenal, or in the pituitary gland were indicated directly by skin changes.

Retention Cysts of the Mucous Membrane of the Lip.—Dr. ROBERT L. SCHEIN, of Kansas City, Mo., and Dr. FRANK SIMPSON, of Chicago, described a new type of epulide which was designated as retention cysts of the mucous membrane giving an interstitial, fibrotic, clinically benign

logical dissertation. Doctor Sutton had several cases of these retention cysts on the lower lip. They were about one fourth to one half inch in circumference, covered with normal mucous membrane and containing mucous secretion and cells. He had treated them by evacuation, cauterizing the base with some chemical agent.

Dr. WILLIAM A. PUSEY, of Chicago, in discussing this paper, said he had observed such cases and had found considerable success in treating them by the cautery.

Adenoma Sebaceum: Report of Five Cases in One Family.—Dr. J. B. SHELMIRE and Dr. JAMES H. BLACK, of Dallas, Tex., gave an interesting report of adenoma sebaceum in a father, aged forty-five, three daughters, aged twelve, ten, and seven years respectively, and a son, aged four years. All were intelligent people, in contradistinction to the usual conception to the contrary. The pictures were classical. In each patient other congenital defects, such as fibromata, pigmented and warty birthmarks, were noted. Considerable therapeutic success was achieved by using carbon dioxide snow. This report threw an interesting light on the familial and perhaps hereditary origin of a rare condition.

Dermatitis Lycopersicum Esculentum.—Dr. EVERETT S. LAIN, of Oklahoma City, Okla., has introduced into the literature the fact that the tomato is capable of provoking a vesicular dermatitis similar to that due to poison ivy. He reported two patients so afflicted, who noted that it was in the morning when the plants were dew laden that the patients were most likely to be affected.

A Case of Sporotrichosis Resembling Tuberculosis of the Skin.—Dr. J. S. EISENSTAEDT, of Chicago, said that his patient had done no work exposing him to infection nor was there any initial lesion, or "chancre sporotrichosique." The lesions themselves appeared not along the lymphatics, but rather diffusely dispersed, which was very unusual, and they resembled tuberculosis of the hypoderm. The sporothrix of Schenk and Heptsen was recovered in the cultures.

The Etiology of Lichen Planus.—Dr. ERNEST DWIGHT CHIPMAN, of San Francisco, epitomized the relatively modern conception of the cause of lichen planus as a disease in adults, occurring more often among men than women, and observed so often among nervous, irritable subjects in connection with moral shock and violent emotion, accompanied by neuralgia, insomnia, etc. One was bound to consider the cutaneous manifestation as the result of deranged nerves. There were, however, some authorities in this country who considered the disease as toxic. The speaker's argument was that both these conceptions were correct, but incomplete, the real underlying cause being a focal infection. He had observed eight cases of lichen planus with infected teeth, the removal of which effected either cure or improvement. The infectious or toxic material absorbed into the body economy was doubtless the ultimate factor in precipitating the disease by the channels of the sympathetic nervous system.

SECTION IN OBSTETRICS, GYNECOLOGY, AND ABDOMINAL SURGERY.

Enterostomy and Enterocolostomy in Intestinal Obstruction Following Pelvic Operations.—Dr. BROOKE M. ANSPACH, of Philadelphia, presented this subject as the chairman's address. Intestinal obstruction, he said, often occurred after abdominal operation and was very distressing. Points in technic which should be noted were: the peritonealization of raw surfaces and closure of all openings into which the viscera might slip; the avoidance of intestinal trauma by handling during operation; care in drainage, thereby avoiding infection. Deficiency in blood supply made the wall of the gut thus peculiarly susceptible to infection and adhesions were likely to occur. Trauma and want of aseptic technic were causes which made for obstruction; the unwise giving of cathartics, thereby causing trauma to the bowel by excessive peristalsis was also a frequent factor. Essential measures of prevention were most scrupulous asepsis; avoidance of trauma, and omission of too early catharsis. If the condition of obstruction were immediately recognized, a very large proportion of the cases would recover. Early recognition was, however, difficult because the symptoms were often simulated by other conditions. Such symptoms as tympanites, acetoneuria, and ether vomiting were common to many other states. Three stages could be noted—that of onset; obstruction; toxemia. Pain, distress, and vomiting, not relieved by gastric lavage or by enemata, were diagnostic signs, and if these were present operation should be performed immediately. The second stage of obstruction showed gangrene of the bowel, and in the third stage, toxemia was acute. Often there was a delay of twenty-four hours before operation was done. In volvulus the lesion was similar, but the condition was localized to one loop. The high type of obstruction in the small bowel was found to be much more fatal than that in the lower. The toxins found their way into the blood through portions of the lining of the intestine where injury had occurred; they might rise from the secretory activity of the digestive glands or from bacterial activity, but, as long as the mucosa remained intact, they were harmless. However, after removal of the obstruction these toxic products were sometimes loosed by the peristalsis and the patient died of the resulting toxemia. The operation of enteroenterostomy gave the bowel a chance to recover itself. In some cases the small intestine was anastomosed to the large intestine below. When junction was made with the sigmoid, enterotomy was not indicated, but it was used in the case of anastomosis to the cecum. Results of the operation showed that the exclusion of part of the intestinal tract had done no harm and that enterocolostomy had a definite place in the treatment of acute pelvic obstruction.

Clinical Observations and Results of the Newer Methods of Operations in Congenital Pyloric Stenosis and Gastric and Duodenal Ulcers (with lantern demonstrations).—Dr. ALFRED A. STRAUSS, of Chicago, read this paper, giving the etiology, diagnosis, and operative procedures of this condi-

tion and results in sixty-six surgically treated cases, and thirty-six medically treated. The cases were not selected, some patients being in a moribund condition when seen. Three deaths were recorded following operation. Pyloroplasty was the method of choice, by which means the pathological pylorus was reconstructed into the normal one. The mucosa was found infolded and was unfolded; the pyloric tumor split and spread out. With simplified technic the operation lasted only ten minutes and the mortality was found to be less than four per cent., as compared with thirty or more per cent. with gastroenterostomy. Immediate relief was at once apparent from the operation. The size of the tumor was found in direct proportion to the age of the patient. In a twelve weeks' baby the tumor was of considerable size. No nausea or vomiting followed the shelling out of the tumor and the child could shortly be fed, per catheter, with mother's milk. The fluoroscope was the best method for differentiation between medical and surgical cases. Bismuth was placed in the bottle with the mother's milk and when the baby was placed on its right side the peristaltic waves were seen. These had a peculiarly characteristic snake-like appearance. If seventy per cent. of the milk passed through in four hours, the case called for medical treatment. Etiological factors were the occurrence of peristaltic waves during fetal life, which by stimulation of the intrinsic and extrinsic nerves of the stomach gave rise to tumor formation.

Hypertrophic Pyloric Stenosis in Infancy.—Dr. WILLIAM D. HAGGARD, of Nashville, Tenn., presented the case of a lusty baby boy, breast fed, its young mother healthy, who, two or three weeks after birth, began to exhibit projectile vomiting and loss of weight. Such symptoms almost surely pointed to pyloric stenosis. In such a case the operation of choice was pyloroplasty, instead of, as formerly, gastroenterostomy. Local anesthesia was the best method. The pylorus contained an olive shaped tumor. The pyloric walls were very thick with dense mucosa. The symptoms of the condition were projectile vomiting, emaciation, appearance of starvation stools, and diminution of urine. The child was frequently hungry, even after vomiting. Visible peristalsis occurred, appearing like two balls chasing each other over the abdomen. Occasionally a certain amount of food passed the pylorus and if this were sufficient in amount, medical treatment might be employed. Operation was indicated when no improvement occurred. With early diagnosis and improved technic, the mortality could be kept down to ten per cent. Local anesthesia was a more successful method with the infant, as it had no psychic consciousness of pain or of fear. The use of surgery was often too long delayed and used finally as a forlorn hope. These misguided efforts at too prolonged medical treatment often denied the patient any chance of recovery. The mortality of gastroenterostomy was stated to be thirty-three per cent.; that of the Ramstedt operation being eighteen.

Uterine Inertia: a Series of Cases.—Dr. PAUL TRUS, of Pittsburgh, in presenting this subject, said it is doubtful whether inertia could be classed properly as "primary" or "secondary." The question of

time entered into the estimate of the matter. A primipara with an average sized baby, and a multipara with a small baby might have labors of equal length. It was not known why 280 days should elapse before labor occurred. This time did not seem to have direct connection with fetal development. When labor was artificially induced after premature rupture of the sac, there was always more or less inertia, usually secondary to some primary condition. True inertia was probably some inherent fault in uterine muscle tone and secondary inertia was probably exhaustion from exertion against some force encountered. In the two states, treatment was different. In inertia little was to be done, but with exhaustion, due to contracted pelvis, face presentation, etc., there were certain forms of treatment. Individuals below par faced the strain of labor poorly, had little patience, and made a great demonstration, which, unless the physician was sure of his ground, made trouble for the family and for the patient. Dry labors were supposed by the laity to be troublesome, but some of these cases did have strong labor pains, and those with late rupture of the sac, often did not, so that inertia was a condition *per se*, and not dependent upon other phenomena. In all cases of inertia, rectal examination, rather than vaginal, was recommended in order to avoid infection. Pituitrin was never to be used, unless after expulsion of the placenta. In conclusion it might be said that the treatment in inertia was expectant, and in exhaustion prophylactic. In the first stage of labor inertia, uterine stimulants should be given; in the second stage, multiple incisions of the cervix, by forceps, or by vaginal Cæsarean section. Retention of placental material, with or without hour glass contraction of the uterus, might occur with this condition.

Conservation of Ovaries After Hysterectomy: Technic of Extirpation of the Uterus.—Dr. GEORGE C. GORDON, of St. Louis, Mo., said the ovaries left behind after hysterectomy were apt to undergo cystic degeneration and might necessitate secondary operations. This complication was almost certain to occur if ovaries were preserved which already bore within themselves the seed of degeneration. Such were characterized by changes, however slight, in size, shape, and color, or by the presence of adhesions and must rigidly be excluded from preservation. On the other hand, there were many cases in which the ovaries, perfectly normal at the time of operation afterwards degenerated into cysts. This disturbing sequel was due to interference with the circulation of the ovary, the mechanism of which had become quite clear through the investigations of Sampson, who had shown convincingly that the greater part of the blood supply of the ovary came from the uterine artery and not, as heretofore assumed, from the ovarian artery. The ligation of the uterine artery during hysterectomy, therefore, interfered with the supply of blood temporarily, of its full quota of arterial blood. The ligation of the uterine veins had an even greater effect upon the ovary, but it was limited to some

congestion with consecutive swelling from which the organ might not fully recover. The difficulty could be overcome by a technic safeguarding the integrity of the uterine artery when it was desired to remove the uterus but leave the ovaries behind. The writer had followed the lead of R. L. Dickinson, of Brooklyn, by making his incision within the uterus itself, in such a way that a narrow strip of uterine muscle was left behind on either side. The various steps were illustrated by lantern slides. The muscle strips were folded in by a continuous catgut stitch which checked all bleeding. The two edges were then sewed together and the bladder peritoneum pulled over the top of the attenuated remnant of uterus and united with the peritoneum of the cul-de-sac, thereby all suture lines were covered, and the uterine artery remained intact to nourish the ovary. Objections which might be raised are these: The operation required more skill than needed for an ordinary hysterectomy; it consumed a little more time; and there was in some cases, a somewhat greater loss of blood. These disadvantages could be reduced to a minimum and were more than outweighed by the actual benefits observed in the series of cases reported. The scope of the operation was rather limited; but where indicated, it gave reasonable guarantee against further trouble from the ovaries.

Goitre in Pregnancy.—Dr. L. F. WATSON, of Chicago, reported seven cases of toxic goitre with exophthalmos, and nine of toxic goitre without it, occurring in pregnancy. These patients were treated with quinine and urea injections and the results were favorable, some who were treated in 1913, reported that they were still well in May, 1918, and others who have had children since taking treatment have had no recurrence of goitre or symptoms. In the hands of one experienced this method of treatment was without the dangers of an operation, and would often afford relief to those whose condition was too serious to warrant thyroidectomy. The speaker urged that physicians be more on the alert for this complication, and that questionable cases should receive more painstaking diagnosis and more continued observation.

Extending the Care of Pregnancy.—Dr. I. L. HILL, of New York, said that the greater number of women in America suffered from inadequate care in childbirth. For twenty years the death rate had not decreased, while many formidable diseases had yielded to medical science. The practice of midwifery in America was chiefly in the hands of the medical profession. Obstetrical care by midwives in the large cities had improved greatly because of supervision and regulation. It had been shown that prenatal care would diminish maternal mortality, stillbirths, and infant deaths in the first month of life. Reductions of over sixty per cent. in maternal mortality were shown in some groups of supervised women. The patients showed great willingness to cooperate. The investigations of the Children's Bureau of the Department of Labor in a study of rural obstetrics showed that prenatal care in the country districts was entirely inadequate. In Manhattan certain districts were receiving the benefits of intensive prenatal care. The author believed the

care of pregnancy should be made more uniformly efficient for all classes of women throughout the country. He considered it a national problem. There was a probable salvage of 75,000 lives annually by good care in pregnancy. At this time a movement to obtain this result might be regarded as a war measure. The cost would not be great estimated according to the new standard of war expenditures. Obstetrical practice by physicians would acquire greater dignity and importance through the education of people generally as to its necessity. The national government should appoint a commission to conserve motherhood, not only by studying the question and organizing cooperation among the existing agencies, but also by creating a system of rural nursing, training and maintaining a body of government nurses, and other measures. In England the sum of \$9 was given to every woman bearing a child, to ensure her careless freedom from work for a week.

Parotitis Following Induced Abortion.—Dr. W. P. MANTON, of Detroit, reported a case of parotitis following induced abortion for pernicious vomiting in pregnancy. From the study of mumps in which a specific organism is carried from the gland to the testes in males and the pelvic organs and breast in females and from the collected cases of parotitis following surgical operations on the abdominal and pelvic organs, as well as from the fact that parotid bubo may follow other operations, he concluded that there was a two ways path not yet understood between the parotid and other parts, which conveyed the germs or toxins from the operation site or the uterus in pregnancy and puerpera, to the parotid, and that the conditions might arise either from a general infection or a local infection through Stenson's duct. He called special attention to the fact that the parotid alone of the three salivaries contained lymphatic glands, and that this might account, in a measure, for its susceptibility. The *Staphylococcus pyogenes aureus* was the organism which was usually found in the pus from parotid abscess.

SECTION IN SURGERY, GENERAL AND ABDOMINAL.

End Results in Hodgkin's Disease.—Dr. RALPH E. MORTER, of Milwaukee, Wis., reported ninety-three cases. The summary included those treated by Dr. J. L. Yates, of Milwaukee, prior to July, 1917, with additional cases. Sixty-three of these were reported by Yates and Bunting previously, and the treatment carried out was that described by them in the literature of recent years. Hodgkin's disease and a group of allied affections were considered a noncommunicable, infectious granulomatous process due to the *Bacillus Hodgkini*, and partook in effect of the destructive potentialities of both a malign infection and a neoplasm. The treatment prescribed was the detection and elimination of the portal, or portals, of entry, followed by complete and extensive surgical removal of as much accessible pathological tissue as circumstances would permit, aiming to rapidly place the balance of power on the side of individual resistance. All surgical procedures were promptly followed with

x ray and repeated from time to time. X ray was considered a valuable adjunct to treatment if applied judiciously. The dose and application were measured by frequent blood counts, the actual lymphocyte curve being the index. Immune serum was employed as a routine in all cases because seemingly more uniform, and better results were obtained with its use. General hygiene and prolonged rest should be employed to maintain results. No special form of medication had proved of any value, and except for tonics and the like, no other drugs were used. Apparently there was a fairly distinct line separating a possibly curable and an incurable condition in Hodgkin's disease. On one side, curable, there was an apparent absence of demonstrable deep involvement; on the other, incurable, its presence. In the potentially curable group there were twenty-six cases reported.

Taking the fifth successive year of clinical freedom from all evidence of disease as the earliest period upon which to base any valid claims of recovery, seven cases were reported as such. Two were of ten years' duration since inception, one of nine, two of eight, one of seven, and one of six. One case—duration five years—fell in the three to four years' period; two—duration, $2\frac{1}{2}$ and $3\frac{1}{2}$ —in the two to three year period; and five cases—duration two to four years—in the one to two year period. Periods of freedom of one year or less were of no value as prognostic evidence. Of these twenty-six cases, apparently the only types where recovery was possible, there were five deaths; one of these patients discontinued treatment and one refused to begin. Thus the actual mortality rate was less than twelve per cent. to date, and fair estimate as to the probabilities of recovery was seventy to eighty per cent. In the later cases, except where lethally involved, much could be done in the way of prolongation of life and comfort, life having been prolonged in one instance eight years. The interim between a potentially curable condition and a hopeless widespread invasion might be only comparatively short. This accentuated to the utmost the importance of early diagnosis and treatment. To obtain lasting results it was necessary to follow the patient for years with appropriate treatment until the blood picture returned to normal. The paramount factor was early diagnosis followed with adequate treatment. Hodgkin's disease, if taken reasonably early and vigorously treated, was not necessarily fatal.

The Role of the Cystic Duct in Recurring Cholecystitis.—Dr. J. EARL ELSE, of Portland, Ore., rounded his audience that the cystic duct had three layers—an inner mucous, a middle muscularis, and an outer fibrous. Projecting into the duct were semilunar shaped valves, known as the Heisterian valves. These are broader, taller, and closer together at the upper end. They contained circular muscular fibres as well as the ends of longitudinal fibres belonging to the muscular layer. There were present mucous glands extending from surface of the mucosa into the deeper layers. Lesions of the cystic duct were classified as first obstructive, under which were the intrinsic, or those lying in or extending into the lumen, the intramural, or those involving the walls of the duct, and the ex-

trinsic, or those lying outside; and second, the processes which harbored infection, best classified as intrinsic, or those in which the organisms grew within the lumen, and intramural, or those in which they are harbored within the walls of the duct. Of the obstructive lesions, he dealt especially with the pathology of the Heisterian valves, which sometimes became markedly enlarged, obstructing the duct. Of the processes harboring infection, the changes in the mucous glands were dwelt on, showing that these became infected and distended so that they were a menace, both through organisms going into the cystic duct and up to the gallbladder, and going into the general circulation, and producing infection elsewhere.

Clinically, he classified the lesions as those producing transitory complete obstruction, permanent complete obstruction, transitory partial obstruction, and permanent partial obstruction, and those which served as a focus of infection.

SECTION IN NERVOUS AND MENTAL DISEASES.

Pineal Gland Neoplasms; Report of a Case Studied Clinically and Pathologically.—Dr. A. L.

Schiff, of New York, presented the following salient historical, anatomical, and pathological facts and a history of the author's case was given. The patient was a male, age nine years, and perfectly well prior to July, 1916. Early in July he had pertussis, which was immediately followed by present and fatal illness. The progress of the disease was rapid. Death occurred March, 1917. The onset was with severe headaches and diplopia. About the same time appeared an extraordinary growth and development in general, as well as an abnormal development of the sexual organs and functions. In many respects the development was that of a boy sixteen years old. A certain amount of adiposity was present during the first four months of illness. A few months before death he became emaciated, had bed sores and contractures. A lumbar puncture showed the spinal fluid under high pressure. The autopsy was limited to the brain. All the ventricles were widely dilated. A large tumor mass was found at the site of the pineal gland lying in the third ventricle and compressing on neighboring structures. The aqueduct of Sylvius was so dilated and distorted that one could look into the fourth ventricle through it. The tumor weighed 74.25 grams, and measured 6.2 cm. by 4.8 cm. A section showed much glandular tissue with cells very much like those of a normal pineal. The tumor was covered with ependyma cells and a thick layer of glia tissue, with much connective tissue. A few lymphoid cells were present. The tumor was classed of a compound pineal gland type.

The symptomatology, physiology, pathology, prognosis, and treatment were discussed, and the speaker summed up as follows: In the case which he had reported it was interesting to note that an extreme precocious sexual developmental state appeared suddenly and with it a certain amount of adiposity. That the patient in a few months passed into a stage of decline, lethargy, and stupor with cachexia. A diagnosis of pineal gland tumor had been made and verified by the autopsy. It was not believed that sexual and developmental changes as

demonstrated in this case could have occurred in a pituitary gland case or in a polyglandular one. Accordingly, it was justifiable to believe that the pineal gland had a function of much service until seven or ten years of age, after which it declined and was probably of no value to the animal economy after fifteen or twenty years of age. It probably secreted a substance which might be considered as a hormone and whose function was to inhibit sexual development until a certain age had been reached.

Personal Equation in Psychiatry.—Dr. L. B. PILSBURY, of Lincoln, Neb., said he considered the study of personal character, of conduct, and expression, in other words, of habitual reactions, as always of the greatest importance in psychiatry. Individuality was quite persistent in insanity. Memory played as large a part in experience as experience did in personality. Conscious memories formed the chief line of demarcation between individuals. He would ask if hallucinations were determined by conscious or unconscious memory? Personality was of etiologic importance in insanity if by personality we meant that individual set or bias which created a presumption either for or against normality in reaction to adverse circumstances. Psychiatry did not profess to be an exact science, but was always striving to introduce factors of greater precision. Individual make-up probably had most to do with determining types of insanity, and this led to the assumption that, with a given set of similar adverse factors in two individuals, each would respond with the type of psychosis for which the stage was set in the beginning. He advised carefulness lest there should be a falling into the pit of philosophic determinism. Dualism seemed a fruitful hypothesis if we could find ways of bridging the gap between mind and body and establishing psychophysical parallelism. This saved us from materialism on the one hand and from pure idealism on the other. Any physical cause to produce insanity must in some way affect the flow of ideas, and this called for a mechanism the nature of which was very difficult to understand. Perhaps the greatest achievement of modern psychiatry was to be found in the biologic point of view, that is, one which regards the human organism as a whole, both ontogenetically and phylogenetically. Fallibility of judgment was inherent in the human mind and necessarily led to a fairly high percentage of error.

Radiculitis—Its Diagnosis and Interpretation.

—EDWARD F. MAYER, of Pittsburgh, Pa., said there was occasionally met with a form of disease which was not peripheral nor spinal in character. He referred to involvement of the nerve roots, especially those of the sensory nerve. Often this was only part of a localized meningitis, often it was only part of a generalized syphilis. But the clinical signs of a neuralgia, accompanied upon examination by a loss of sensation of a radicular character, revealed a root involvement. The characteristic dissociation types of sensation, which were spinal in origin, were not found. Muscle wasting was not a prominent part of the picture as a rule. The onset was sudden; the prognosis was good. Herpes might proceed or accompany the other signs. It was a syn-

drome, which had no mechanical factors for its origin. There were no deep alterations as a rule in sensibility. These, like the true dissociating types, indicated spinal involvement. The distinguishing signs between peripheral and radicular innervation were well established, but there was a necessity also in many cases of distinguishing between spinal involvement and disease of the roots alone. In most cases this was possible and the author presented the different points, which make such a differentiation possible.

Neurosyphilis.—Dr. JOHN A. FORDYCE, of New York, said that neurosyphilis was a much more frequent sequence of the infection than was indicated by the available statistics which were compiled before the introduction of modern diagnostic methods. These figures were based mainly on the fully developed clinical symptomatology and did not take into account the large number of victims who were neurosyphilitic from a laboratory standpoint and presented only ill defined physical signs difficult to interpret from a clinical study alone. It was impossible at this time to give accurate statistics as to the percentage of infected individuals who showed involvement of the fluid. We had, however, fairly accurate data as to the number of patients in the first year of the disease who showed clinical and serological evidence of such involvement. He was led to believe that, once the fluid was strongly positive, cure seldom occurred unless persistent and proper treatment was instituted and vigorously carried out. If we assumed, therefore, that the twenty-five to thirty per cent. of patients who showed abnormal fluids in their secondary stage retained the infection, they were potential candidates for one or the other forms of neurosyphilis. This would lead one to suspect that instead of ten per cent. with nervous syphilis according to the old statistics, at least twenty per cent. would on careful examination be shown, which estimate was probably lower than the actual number that would be revealed by our modern methods of precision. It was possible too that later involvement in uncured cases may take place from a focus in some part of the body as in tuberculous meningitis from a focus of that disease. We can, at least, by employing the newer methods of diagnosis and treatment control the majority of the early infections of the fluid and greatly limit the number of neurosyphilitics in the future. The purely clinical methods of diagnosis employed in the past and unfortunately also at this time, together with inefficient therapeutic procedures have resulted in a large number of individuals permanently disabled both mentally and physically who became inmates of public institutions or a constant care and expense to their families. These tragedies to the individual and the expense and economic loss to the State could be limited first by educating the public as to the far reaching results of the disease and encouraging sexual continence; second, by instructing the individual how best to escape infection after exposure.

The author said neurosyphilis was employed as a comprehensive term to include all types of the disease which might involve one or all of the tissues of the central nervous system. Cases were cited to

illustrate the symptomatology and serology of the various forms of involvement. Observation of a large number of cases during the past six years in which the clinical manifestations had been carefully correlated with the serological findings convinced him that the symptomatology should be largely restudied and interpreted from the serological as well as from the clinical standpoint. Fluid findings enabled us to differentiate more accurately the symptoms due to pure vascular syphilis, meningovascular or parenchymatous. It enabled us further to prognosticate the outcome of certain types and understand why the deeper forms resisted all treatment and eventually terminated in incurable conditions. The latter type might have few symptoms but show a serology which offered the gravest prognosis; the former acute and menacing symptoms which readily yielded to treatment and terminated in complete recovery. The statement that no information was afforded by spinal fluid examination that could not be obtained from clinical examination was erroneous and misleading.

The strain theory of spirochetes in neurosyphilis was referred to and instances of conjugal and familial infections were recorded as clinical evidence. The value of spinal fluid examinations as a diagnostic measure was becoming more generally recognized among syphilographers and neurologists. Treatment begun in the primary and very early cases of secondary syphilis doubtless prevented infection of the fluid, but it was impossible to say how much value treatment had in preventing the invasion in the fully developed secondary stage, for at that time involvement might already have taken place. The importance of early lumbar puncture and careful and repeated neurological examinations



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was emphasized in view of the fact that patients had been met with in the first year of their infection who, in spite of numerous injections of salvarsan and mercury had developed neurosyphilis.

SECTION IN ORTHOPEDIC SURGERY.

Disinfection of the Knee Joint.—Dr. ROBERT B.

CORLISS, of Chicago, Ill., reported that septic infection of the knee joint, whether from penetrating wounds or autogenous infections has yielded remarkably satisfactory results from disinfection and immediate closure of the joint capsule. Favorable results, with retention of joint function,



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seemed to depend upon certain principles; the operation must be done early, before the spread of infection and disorganization of the joint structures had time to occur; thorough lavage of the infected and contaminated area followed by primary closure of the joint capsule, was essential; foreign bodies must not be allowed to remain within the joint cavity; where drainage was used at all, it should be carried down to the capsule, but not into the joint cavity; immobilization of the joint must be secured by adequate mechanical fixation. The diagnosis was made from the cytological investigation rather than from the bacteriology of the joint fluid.

After opening the capsule, the joint should be thoroughly flushed for fifteen or twenty minutes with one to fifteen thousand bichloride in salt solution, the wound then closed in layers and the limb thoroughly immobilized with a plaster spica, extending to the toes. Active and passive motion should be begun after all signs of inflammation had subsided.

Cerebral Spastic Paralysis.—Dr. M. E. BLAHD

and Dr. W. C. Soper, of Cleveland, Ohio, summarized the salient features in the diagnosis and treatment of cerebral spastic paralysis as follows: Little illness, but not a transient one, but rather a cerebral palsy resulting from various general factors, which were divided into three groups—*intrauterine, intrapartum, and extrauterine*. There were numerous cases with mild cerebral spastic paralysis and the degree of involvement was dependent entirely upon the extent of involvement of

the pyramidal tract. The end result was the same regardless of whether the lesion produces an injury to the pyramidal tract by means of pressure, inflammation, edema, or hemorrhage. No stereotyped procedure could be used in the treatment of these cases and the treatment was dependent upon the etiological factors, the condition of the muscles, and the intelligence of the patient. The diagnosis was based on the spastic condition of the muscles, the increased reflex excitability, and the lack of muscular coordination, often, however, there were no focal symptoms indicative of the origin. If a permanent injury to the pyramidal tract had occurred, it was almost fruitless to attempt to remove the cause, for destroyed nerve elements possessed very little, if any, regenerative powers. Emphasis should also be laid upon the mentality of the patient. Mental impairment often existed to such a degree as to preclude any surgical measures. The treatment of spastic paralysis must, therefore, consist in restoring to the higher centres the powers of useful coordinate movement in the limb or limbs affected, the restoration of muscle balance, the overcoming of the ataxia, and the training of muscles to respond quickly and accurately to the normal centripetal stimuli of physiological activity.

The following outline gave in brief the courses of treatment open to the surgeon: 1, muscle and tendon operation; 2, brain operations; 3, motor nerve operations; 4, centripetal (sensory) nerve operations. All forms of treatment would fail unless the educational aftertreatment was conscientiously and painstakingly carried out. Lack of aftertreatment rather than the regeneration of the posterior nerve roots caused most of the failures in operations of this kind.

Loose Bodies in the Elbow Joint.—Dr. M. S. HENDERSON, of the Mayo Clinic, Rochester, Minn.,



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said that although loose bodies were well recognized as occurring in the knee joint, they were not generally recognized in the elbow joint, and such cases

formed a distinct group. Twelve cases were reported, in nine of which operations were done. The patients were all males. The loose bodies were found to be in the right elbow in nine cases, in the left in two, and in both elbows in one. The number varied from one to as high as sixty-five; the size also varied. They were usually rounded



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and covered with cartilage, and on section proved to be mostly cartilaginous with little flakes of bone placed here and there. The symptoms produced were mechanical; usually a lack of extension, and occasionally a locking of the joint. The bodies might be removed by any one of three incisions; the first on the front and inner side of the joint; the second, to the outer and front side, going down onto the head of the radius, and the third, through the lower fibres of the triceps posteriorly.

A Bone Holding Forceps.—Dr. ROBERT EMMETT FARR, of Minneapolis, Minn., said that the multiplicity of bone forceps designed to overcome the displacement of bones was sufficient evidence that most of these devices had certain shortcomings. In order to meet the requirements, such a device must have sufficient strength and adaptability to bones of different diameters. Its application should be simple, and it should have means of overcoming displacements by manipulations. The instrument he presented consisted of two long boneholding forceps which might be readily united to each other by a carriage and worm drive arrangement which required the forceps to be brought parallel to each other in one plane only. Once assembled, extension may be overcome by means of the worm drive, which was operated by means of a two way reversible ratchet. Movement in one plane might then be accomplished by moving the handle of the forceps over the screw, which acted as a fulcrum. Movement in the lateral plane was achieved by means of a ratchet propelling the carriage on one stationary forcep. It would therefore be seen that once the device was assembled, displaced fragments

of bone might be brought into any desired position by the manipulation of either of the rachets or of the forcep handles. The bone grasping end of the forceps was so designed as to allow their application to bones of any size and to leave free approximately one third of the surface of the bone; these free surfaces lay in the field of operation so that transplants or other mechanical appliances might be used without the necessity of removing the forces.

SECTION IN STOMATOLOGY.

The Lipoids in Tumors of the Dental System.—Dr. K. WELLER DEWEY, of Chicago, Ill., summarized her paper as follows: The lipoids in tumors were still generally referred to as "fat," or cholesterol alone had been made the subject of investigation. There were, however, several well defined kinds of lipoids occurring in tumors, often side by side, and it had been one of the objects of this study to show that the various stains for lipoids, and especially the more recently devised staining methods of Ciaccio, Smith, and Fischler, were fairly adequate means of differentiating them. The use of the polarizing microscope was indispensable in such work. Of great value were tables of the group reactions set up by Aschoff and Kawamura. The chief lipid in tumors about the mouth, as in other parts of the body, was cholesterol, occurring as the stable ester compound and much more frequently in more or less loose combinations with fatty acids and other lipoids. Such crystals were mostly doubly refractive. Mixtures of cholesterol with glycerine esters or neutral fat had no such properties. In the tumors studied, cholesterol in these various forms was found to occur much more in the con-

tioned in the literature was the presence of fatty acids and soaps in the zone of squamous epithelial cells of papillomas and other pathological conditions of the mucous membrane. A condition resembling cornification of the epidermis, characterized by the



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(1918)

occurrence of fatty acids, was not so rarely found. The lipid substances associated with degenerative processes found in tumors of the dental system were possibly particularly suitable for investigation of the important question as to what substances were involved in the process of calcification.

Use of Heat and Radium in Treatment of Cancer of Jaws and Cheeks.—Dr. G. B. New, of the Mayo Clinic, Rochester, Minn., reported the results of the treatment, in the Mayo Clinic during 1917, of twenty-one patients with cancer of the jaw and cheek without glandular involvement. The method of treatment consisted of the thorough cauterization of the growth with slow heat for from twenty to forty-five minutes. A soldering iron and a water cooled retractor were the most satisfactory means of cauterization. This was followed by radium treatment. It was essential that the patients be seen once a month after the treatment, so that if there was any recurrence they might have immediate care. Of the twenty-one patients treated, twenty were traced; of these fourteen were free of local recurrence for from six to eighteen months. One patient who was recategorized three months previously, thus far had no recurrence. One died of lymphatic leucemia six months after operation; there was no recurrence. In two of the fourteen patients, glands of the neck, removed and histologic dissections were done. Thus twelve of the twenty patients had no recurrence locally or in the glands of the neck for from six to eighteen months. One patient, who had been operated on before coming to the clinic, had a recurrence. Four patients died of the cancer; one had been operated



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nective tissue stroma, in endothelial and other connective tissue cells than in the tumor cells themselves. A noteworthy observation was that frequently leucocytes were completely filled with these lipoids. A finding which was practically not men-

on before coming to the clinic; one consulted a plaster doctor, and the condition of this patient could not be learned from his letter. There was no operative mortality. This group of cases showed that the immediate results in the treatment of epithelioma of the jaws and cheeks without glandular involvement by the use of the cautery and radium have been very encouraging. The end results could not be foreseen, but it was believed that by the addition of radium to the treatment, much more was being accomplished than formerly.

Neuralgia Dentalis.—Dr. KURT H. THOMA, of Boston, Mass., said that the oral surgeon and dental diagnostician saw more and more cases of minor neuralgia of obscure origin. Such pain was frequently due to some dental disorder and might be referred to very distant parts of the face and head. It often simulated symptoms which were associated with diseases of the ear, eye, nose, and accessory sinuses. The wide distribution of such pain was due to the extensive area covered by the fifth cranial nerve and its frequent communication with other cranial nerves. The pain might be continuous, periodic, or intermittent. It might be intense, sharp, throbbing, or dull, and it might be only a sensation of obscure, indefinable pressure. The suffering that accompanied these affections was often intense and if of sufficient duration completely wore the patient out. The histological pathology of the etiological factor should be studied more carefully. A careful examination and investigation was necessary to ascertain the cause and to distinguish it from major neuralgia. The Röntgen ray was one of the greatest helps in making a diagnosis, but could not always be relied upon by itself. Heat and cold and electrical tests were often useful, and the diagnostic use of local anesthesia was of great value in locating the nerve branch through which the pain was conducted and determining in what region of the mouth the seat of the trouble was located.

SECTION IN GASTROENTEROLOGY AND PROCTOLOGY.

The First Year of the Section in Gastroenterology and Proctology.—Dr. ANTHONY BASSLER, of New York, said that the activities at the first meeting of this section last year proved the wisdom of the House of Delegates in its establishment. Constantly spreading interest assured progressive success. Although many gastroenterologists and proctologists were now serving the country in efficient war work, the program bore witness to the rapidly increasing number of men interested in these fields. Dr. Dwight Murray in the chairman's address last year said: "It seems to me that during our discussion of the symposiums much can be said which would be of great benefit to the military service and the life of the boys in the army as to the care of their digestive and eliminative tracts. Advice along this line could come from no more competent body of medical men than are in this section of the American Medical Association, and I believe it would be pertinent, notwithstanding the fact that we shall have many good physicians as officers of the army, and without doubt it would be welcomed. Nothing could make for greater efficiency in our

army than keeping the gastroenterocolonic tract in a normal condition. Possibly such advice at the present time may be too late, but I would recommend the appointment of a committee of five to formulate rules for the care of the gastrointestinal tract. This committee should deal especially with nutrition and elimination, and submit its report to the Committee of National Defense, if it is found that the medical advisory board would welcome such advice." As a result of this a committee of five was appointed, consisting of Dr. Dwight Murray, of Syracuse; Dr. M. E. Rehfuß, of Philadelphia; Dr. William Gerry Morgan, of Washington; Dr. Dudley Roberts, of Brooklyn, and Dr. William M. Beach, of Pittsburgh. After indefatigable labor and much expense and time, they succeeded in having the army authorities recognize gastroenterology and proctology, with the appointment of men in the cantonments and for overseas service. The response to the requests was prompt, and soon practically all of the positions were filled with qualified men. In little more than a year this field of work was recognized by the largest national medical organization of any country in the world in the establishment of a separate section for it, and the army authorities have recognized the fact that men so trained would be valuable additions to the army medical staff in caring for the lads we were so proud of today. To the men who have had to do with bringing these two events about much credit was due.

We were at war with a country which sought in medieval ways to fasten upon the world the rule of "might makes right" by advanced methods of destruction after years of preparation for it. Nothing that the human being holds dear—his work, his health and life, his loves and affections, his freedom, his spirituality, his achievements of the past, his country—nothing must be left him. There was nothing to do but to fight for the right, and we ennobled ourselves in doing so. God in his mercy would see us safely and securely through, but, while we were passing through, the medical profession of America must do its share. Our work in the war was tremendously important, and every one of us with real blood in his body must feel this. The country needed more medical men, and every one who possibly could, should serve.

Detailed Examinations of Men Drafted for Military Duty.—Dr. MAX EINHORN, of New York, said that the last year had brought a new duty to the medical profession, namely, the selection of men fit to be soldiers. At the first glance, it appeared easy to judge whether a man would be able to enter the army or not. This was true in the case of perfectly normal individuals or greatly invalidated people. There were, however, a great many ailments, especially of internal organs, which could not be detected by a simple examination, but required detailed and prolonged observation. A simple examination or even a thorough interrogation would not discover important lesions in the gastrointestinal tract. The following plan was suggested to meet this difficulty: Drafted men, whose fitness for military service could not be ascertained offhand, should be sent for observation to the city

hospitals with a request for special investigation and a report. Almost every hospital had laboratory and other facilities for detailed diagnosis, and would willingly put its wards at the service of the government. Such a report would enable the physician in charge of the examining board to judge as to fitness for military duty.

Probable Endocrine Origin of Peptic Ulcer.—

Dr. G. A. FRIEDMAN, of New York, stated that the initial lesion of peptic ulcer was due to a vascular change, ischemia, or stasis. The ischemia resulted from static contraction of the smallest vessel supplying a limited area of mucosa, or by constriction of the vessel due to a spastic contraction of the limited area of musculature surrounding it. Stasis was attributed to vasodilatation or to pull on the vessel wall by the relaxation of the surrounding musculature. There was consequently an interference with the blood supply, and hence with nutrition. The initial lesion resulted. Subsequently, ulceration took place, primarily through the corrosive action of the free hydrochloric acid of the gastric juice. He then proceeded to show that the vegetative nervous system was fundamentally the main etiological factor, for it originally affected the bloodvessels or musculature, causing their constriction or dilatation, their contraction or relaxation by action on the vegetative nervous system. By clinical observation and experimental work on animals the vegetative nervous system was shown to be dominated by the glands of internal secretion, particularly the thyroid and adrenals, and to a lesser extent the parathyroids.



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Diseases of the Digestive System.

Disturbances in internal glandular secretions caused a disturbed equilibrium in the vegetative nervous system. Functional disturbances in the vegetative nervous system were manifested by functional disorders in the various organs supplied by these nerves. To this was attributed the so called

organ neurosis. In the stomach the local neurosis might produce pylorospasm, gastrospasm, hourglass constriction, atony, an acidity, hyperacidity, or hypoacidity, that is, alterations in normal peristalsis and secretory functions. That gastric neurosis depended



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primarily upon internal glandular neurosis was first hinted at by William Mayo in 1907. What was known to happen in large areas of musculature might be assumed to happen in smaller areas. Hence localized areas of contraction or dilatation due to altered equilibrium in small filaments of nerves giving rise to the circulatory disturbances might occur. Lesions from ischemia or stasis probably formed in the entire intestinal tract as well as in the stomach, but on account of the absence of hydrochloric acid, ulcer rotundum did not occur. The lesions might become the site of bacterial invasions, and this probably happened in appendicitis, which was so often associated with ulcer. Doctor Friedman then discussed the glands of internal secretion, their function, action, particularly upon the processes of digestion, peristalsis, and nerve supply. The spastic stomach was caused by deficiencies in parathyroid or epinephrine secretions, or by excesses of one or more of the thyroid products. The subtonic stomach was due to deficiencies in thyroid products or to excesses in parathyroid or epinephrine secretion. The functional disturbances in the true endocrinous glands might in the course of time lead to actual pathological changes in the glands themselves. Hence the well-known fact that Dr. De Lee found on autopsy of ulcer cases marked gross changes in the adrenals. Doctor Friedman advised looking for pathological lesions in the thyroid glands as well as in the adrenals. Graves's disease, Addison's disease, and myxedema were conditions due to glandular disturbances, hyperfunctional or hypofunctional disturbances of the glands affected. In these diseases the local organ neurosis might be

found, due to the glandular disturbance which produced a disturbed equilibrium in the vegetative nervous system. While pathological lesions might be found in the glands, peptic ulcer might or might not exist, yet the effects of the local neurosis might often be demonstrated clinically by laboratory tests or by the fluoroscope. Clinical proof was presented to show that the initial lesions was associated with internal glandular neurosis. Peptic ulcer cases presented vegetative stigmata. They responded to the pilocarpin or adrenalin tests, or both. Examination of gastric contents and x ray findings were somewhat characteristic. Failure to cure an ulcer medically or surgically due to the presence of an anomalous constitution from a disturbed glandular activity was suggestive. The results of animal experimentation also indicated an endocrinous origin of the initial lesion of peptic ulcer. This was shown by the production of anomalous constitutions in animals, similar to those found in man, by intentional disturbances in the ductless glands by partial or complete extirpation of the glands or by the injections either of certain substances closely resembling the pharmacological action of the secretory products of these glands or by the secretions of the glands themselves. The ulcers did not show a tendency to heal where anomalous conditions were produced. Pilocarpine closely resembled thyroid extract in its action, and produced almost identical gastrointestinal lesions in animals.

SECTION IN LARYNGOLOGY, OTOTOLOGY, AND RHINOLOGY.

Two Cases of Unusual Wounding of the Lateral Sinus.—Dr. VIRGINIUS DABNEY, of Washington, D. C., reported the following two cases: The first patient, a young, robust girl, had chronic otorrhea of ten years' standing. Headache, fever and presence of cholesteatoma necessitated a Schwartz-Stacke operation, during which the lateral sinus was found to have been obliterated, after the apparent formation of a parietal thrombosis, only a small channel along the horizontal limb being left. On curetting the roof of what was really the old sinus interior, but what appeared to be an exenterated antrum, the wounding was done. The true antrum was found far forward, a mere slit between the bridge and the sinus. Operation was completed in three sittings, without further incident. The second patient was an unhealthy, septic boy, with chronic otorrhea of nine years' duration. Pus and cholesteatoma had eroded a large hole in cortex of tip, through which the sinus wall had bulged and become adherent to the periosteum and tendon of the sternomastoid muscle. In elevating this muscle from its insertion here the sinus was wounded, a very disconcerting incident so early in a mastoid operation. The Schwartz-Stacke was done in both cases with good result after two years' interval. That the presence of considerable cholesteatoma and streptococci in both cases did not cause infection in the exposed sinuses is worthy of record, and was accomplished by great care in technic after the exposure.

Lye Strictures of the Esophagus.—Dr. THOMAS HUBBARD, of Toledo, Ohio, reported seven cases in more or less detail as the basis of an appeal to legis-

lators to compel proper labeling of lye cleansers. Three cases exhibiting gastric symptoms, two fatal, were mentioned. Four cases of stricture were detailed, the youngest patient one year of age. Three were the result of careless handling of caustic alkali products, and all were labeled to mislead the housewife and encourage careless exposure. Two of the patients were in *extremis*, water hungry to the limit. In one, the baby, the stricture was at the hiatal orifice. In the other two the strictured area in evidence a few months after accident began opposite the bronchial region and extended to the cardia. In all, deglutition was restored satisfactorily, but all cases must be watched for years to encourage development with growth. One case of concentrated sodium hydrate corrosion of lower five inches of esophagus came to gastrostomy in the second month. Subsequently retrograde dilatation was successful and this was followed up by dilatation *per tubum*. The esophagoscopic control of the bougie was a safety measure. The Sippy method was advocated and in one case the thread guide aided in passing the Sippy wire guide. On the whole, this method seemed very successful, but all precaution details must be followed.

SECTION IN GENITOURINARY DISEASE.

Effect on the Kidney of Uterovesical Anastomosis.—Dr. ANDERS PETERSON, of the Mayo Clinic, Rochester, Minn., reported that experiments were conducted and observations were made for the purpose of evolving a technic for the implantation of the ureter into the bladder, and to study the effect of such operation on the kidney and the ureter. Unilateral implantations were done on eighteen dogs, and bilateral implantations on three, giving a total of twenty-four observations. Four methods of implantation were used: 1. The Coffey technic consisted of splitting the serous and muscular coats for three fourths of an inch, and entering the lumen of the bowel through a small stab wound in the mucosa. The ureter was pulled well into the lumen by means of an anchoring suture placed through the split end of the ureter and tied three fourths of an inch below its entrance. The serous and muscular coats were then approximated around the ureter; and one stay suture was placed one fourth of an inch above the anastomosis. 2. The Stiles technic consisted of entering the lumen of the bowel through a stab wound, and approximating the intestinal wall without further dissections over the ureter; the wall of the ureter was also caught in these sutures. The Coffey and Stiles methods were used, with slight modifications, in the work in this series. 3. The Furniss technic consisted of penetrating a double fold of the wall of the bladder with an artery forceps and pulling the severed ureter through both openings made by the forceps. The ureter was secured to the wall of the bladder by a few interrupted sutures at its lower entrance into the bladder, and the end was permitted to hang free in the cavity of the bladder. The anterior opening was then closed. A technic suggested by Mann, of the Mayo Clinic, was used in a few of the experiments. Two parallel incisions one fourth inch in length and one half inch apart are made at right angles to the long

axis of the bladder, extending down to the mucosa. This seromuscular bridge was undermined, leaving the mucosa intact. A small stab wound was made through the mucosa, at the site of the lower transverse incision. The severed ureter, having been split one fourth inch on its anterior surface, was pulled beneath the bridge from above downward and anchored to the inner surface of the wall of the bladder, one fourth inch below the opening. One or two interrupted sutures were made on each side of the ureter, approximating the transverse incision up to the ureter. Observations of the end results were made from one day to five and one third months following the implantations. There were entirely normal kidneys and ureters in fifteen instances; slight hydronephrosis in two; marked hydronephrosis in one; miliary abscesses of the kidney in one; pyonephrosis in one; normal kidney and hypertrophied ureter in two; and the ureter pulled out in two. Fifteen implantations, or 62.5 per cent., were complete successes. Normally functioning kidneys were found in nineteen, or eighty per cent. There was complete failure from stenosis, infection, and the pulling out of the ureters in five cases, or twenty per cent.

In twenty-one cases in the Mayo Clinic the ureter had been implanted into the bladder and the effect on the kidney had been studied. Fifteen patients had extensive resections for tumor of the bladder and implantation of one ureter. Four had ureterovaginal fistula, in one the right ureter opened into the urethra, and in one the left opened into a diverticulum. Seventeen of the twenty-one patients were cystoscoped from eighteen days to four and

per cent. Four patients died from the fourth day to the second month after the operation; two showed slight dilatation of the implanted side; in one the pelvis was markedly dilated, and in one there was no evidence of obstruction.



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Retiring President of the Illinois State
Medical Society.

The Silent Prostate.—Dr. JAMES A. GARDNER, of Buffalo, N. Y., wished to emphasize the insidious growth of certain type of obstruction at the neck of the bladder. The painless incontinent types was pictured by the wasted old man whose digestive apparatus was upset, had continual thirst, drinking large quantities of water, and finding it necessary to urinate every few moments. He was not able to control his urine and it often dribbled away. When examined they were much astonished to find the cause of their trouble had been a full bladder. They felt that the bladder was empty because they were voiding every few minutes. The condition was due to complete painless atony of the bladder muscles with retention and overflow, and the "lumbago" was caused by back pressure on the kidneys. Because of the damaged kidneys so frequently found, Doctor Gardner believed that the two step operation was the one of choice for prostatectomy and reported a series of 112 unselected cases with out a death. He compared the statistics with the operative reports of twenty-six representative hospitals which reveal mortality rate of 22.5 per cent. as a result of 148 prostatectomies made during the year. This very marked difference in statistics was caused, he believed, by the attention to detail given by urologists.

Doctor Peterson concluded: 1. From the experimental and clinical observations it was obvious that a normal or nearly normal kidney and ureter should result following the implantation of the ureter into the bladder. 2. The utmost care to minimize the operative trauma must be observed. 3. The placing of a clamp over the neck of the bladder should be



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and Physiology.

one half years after operation. In nine cases, or fifty-three per cent, of the seventeen patients the function of the kidney was entirely normal. Fair function was found in three cases, eighteen per cent., and functionless kidneys in five cases, thirty

avoided. 4. No suture should enter the wall or lumen of the ureter other than the anchoring suture placed at the split extremity of the ureter, and the approximation of the wall of the bladder must be accomplished without undue compression. 5. When marked dilatation of the ureter has occurred prior to surgical interference, and when it was necessary to implant the ureter under tension, a successful result was very doubtful, and ligation was preferable to any effort of implantation.

SECTION IN PREVENTIVE MEDICINE AND PUBLIC HEALTH.

State Responsibility and Aims in County Health Work.—Dr. J. N. HURTY, of Indianapolis, Ind., said that counties were created by states and must exist under uniform laws. It was the duty of states and they had the power to control and direct public health affairs in counties. After laying down what should be done, and this should be minimum, a health law, if truly democratic, would accord the uttermost liberty for local initiative. In a word, a state health law, a responsibility a state must fulfill, should accord full opportunity for a county to work out its own health salvation. However, if health salvation was not sought after, then wise provisions must be made whereby the state might step in and make that county innocuous to others. It was plainly true that the county did not require as close individual health supervision as the city, but the general principle that no man may through neglect or intent do harm to his own or his neighbor's health, must be fully recognized. The preservation of the state depended upon men who were physically, morally, and mentally healthy, and while every man's house was his castle and every man's body his own, the state must place limitations as to the use made of them. Neither property or individual health should be abused. Suicide was a crime. The preservation of health was essential for making democracy safe for the world, which was the first step in making the world safe for democracy. In county health affairs it was the responsibility of the state to provide a health law requiring counties to care for their public health, and it should be the aim of the law not to interfere with fundamental rights and to encourage selfhealth protection.

Health Administration in Cities of Less Than 20,000 Population.—Dr. D. B. ARMSTRONG, of Framingham, Mass., said that the health administration of cities of the smaller size was worth serious consideration, for at the present time more than 8,000,000 people in the United States were living in communities of more than 8,000 or less than 25,000 people. While the fundamental problems were similar to those of larger communities, the routine health requirements indicating adequate measures for infant, school, and industrial work, the smaller town problems differed essentially in certain important respects. In the first place, the relation of the health staff to the local citizens, and particularly to the local physicians, would be of a much more intimate and personal character than is the case in larger communities. Further, a smaller town offered certain unique advantages, such as a possible opportunity for the establish-

ment of a central milk pasteurizing plant, the development of local neighborhood committees of leading citizens interested in the health problems of the community, etc. The careful analysis of the detailed requirements of the town of this size would indicate that every obligation could be met, so far as public requirements are concerned, by an average expenditure of about one dollar per capita. On the other hand, if adequate machinery was to be provided for industrial workers and for general health educational needs of the community, another dollar per capita would have to be spent from private sources. In Framingham, Mass., where a reasonably complete disease prevention programme was being carried out, there were indications that the average conservative community could be encouraged without great difficulty to meet its principal health obligations. Framingham when chosen for the Community Health and Tuberculosis Demonstration, was spending forty cents per capita for health from both public and private sources. It is now spending eighty-two cents per capita from public funds, and nearly one dollar per capita from private funds. This experiment, being carried out under the auspices of the National Tuberculosis Association, by means of a \$100,000 fund given to this association by the Metropolitan Life Insurance Company, should be followed carefully as the nation's municipal health experimental laboratory.

SECTION IN DISEASES OF CHILDREN.

Lumbar Puncture in Meningeal Hemorrhage of Newborn.—Dr. JULES M. BRADY, of St. Louis, Mo., reported three cases of a series of nine meningeal hemorrhages in which lumbar puncture as a therapeutic agent was employed. In one case the convulsions were temporarily abated, but Little's disease developed and the infant died at the ninth month. In the other two cases lumbar puncture brought about a cure. One child was now three years of age; the symptoms were so typical that no mistake could be made in the diagnosis. Thirty c. c. of pure blood were removed by the needle on lumbar puncture. The distention of the fontanelle receded, the infant became quiet, and there was no return of the convulsions. Its development to date had been perfectly normal. The third infant was now one year of age, the symptoms were mainly respiratory, but no convulsions. Four lumbar punctures were made in as many consecutive days and 240 c. c. of bloody spinal fluid removed. The recovery of the infant was a matter of the greatest wonderment to all who saw it. Today there was no evidence of spasticity of the infant's extremities or any mental impairment.

These two infants, according to Brady, belonged to the type of infratentorial hemorrhage which was not amenable to craniotomy as the hemorrhage was not accessible. In all cases of suspected meningeal hemorrhage lumbar puncture should be performed, as even in the supratentorial type of hemorrhage some blood cells might be found which would assist in making the correct diagnosis. In the infratentorial type of hemorrhage not only would there be almost a certainty of clinching the diagnosis, but the measure might be of definite therapeutic value, even resulting sometimes in a perfect cure.

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Original Communications

THE PREVENTION OF HYDROPHOBIA.

By H. L. ABRAMSON, M. D.,
New York,

Bureau of Laboratories, Department of Health.

The prevention of hydrophobia is just now a timely topic, inasmuch as the metropolitan newspapers have recently contained accounts of several fatalities from this terrible disease, and also because we are being menaced by an epizootic of the disease in neighboring communities.

The antirabic laboratory of the department of health is not only in a position to keep a sharp lookout on the occurrence of rabies in the city of New York, but also on its incidence in states nearby. Last spring there was an outbreak of rabies in Providence, known through a request for antirabic treatment coming from the Rhode Island State Board of Health. About six weeks later, there was another request from Providence, while about the same time we received an order from New Haven, Connecticut, and since then orders at intervals of four to six weeks from various towns along the New York, New Haven and Hartford Railroad from Providence east toward New York. The disease had reached Stamford and some canine rabies had been reported from Greenwich, Connecticut. Now we are getting orders from towns in Massachusetts and in the Connecticut River Valley. From the west we have been getting requests for treatment from a number of towns in northeastern New Jersey, Newark being our heaviest customer. For the past year and a half orders have been steadily coming in from the western part of New York, Buffalo being the chief supplicator. Last April, the laboratory sent out a questionnaire to health officers in Connecticut, Massachusetts and New Jersey in the hope of obtaining more definite information concerning the incidence of canine rabies. However, the replies would lead one to believe that canine rabies at that time was infrequent.

Word has reached us now indicating that Connecticut and northeastern New Jersey have suffered a great increase in canine rabies, with its attendant increase in number of persons bitten by rabid animals and a consequent increase in number of fatalities due to rabies. That questionnaire should have been a warning to health officers of an impending increase in rabies and should have put them on their guard. The antirabic laboratory might be compared to a lookout on an observation point that can view

a large expanse of territory not visible to the individual health officers on the plains below.

The measures for prevention of hydrophobia consist of two kinds: firstly and most important, general hygienic; and secondly and only complementary, but specific measures. The most important is publicity. If through some means of public health education an influential sentiment could be created for the extermination of rabies, there would be no further need of other measures, general or specific. There is still among the laity, among quite a number of persons who ought to know better, the idea that hydrophobia is a product of the imagination. If these persons are such as could be convinced, this would easily be accomplished by bringing them to the bedside of a patient suffering with rabies or to a laboratory where animals are inoculated with the virus used in the production of antirabic vaccine. These and others ought to have impressed upon them what a terrible disease it is, and how unnecessary in our present day civilization. They ought to be made to see how easy it would be, with their co-operation, to reduce the incidence of rabies to practically nothing. This could be done by a suitable Federal law, regulating the importation of dogs, impounding of all stray animals, and proper supervision of all licensed dogs, and which would act as a stimulus to state and local boards of health. Great Britain and Australia have no rabies problem. They have little or no need of antirabic institutes, because they have suitable laws for quarantine of importations and for destruction of strays and muzzling of licensed dogs.

The difficulty in this country lies in the apathy of the public. The spread of the disease is not sufficiently spectacular to arouse its interest. It may be compared to a chronic ulcer, which constantly annoys but does not kill. The usual history of the spread of rabies is that there is an outbreak in some community, and a number of persons are bitten. If in an enlightened community, there will be a rush for the Pasteur treatment, and an attempt, for a week or two, to clean up the locality of stray dogs and cats, with a half hearted enforcement of muzzling law, if one exists. Then the town will forget all about it for four or five weeks, when it is again aroused to activity by another outbreak. This phenomenon repeats itself interminably. The community is never aroused to sufficient sustained interest to completely rid itself of the sore. If rabies could produce so spectacular a march as poliomyelitis did

in 1916, we would not now be troubled with rabies. So far as we know, dogs and, to a much smaller degree, cats are the only animals that are at all a menace to the human race, as far as rabies is concerned, and furthermore—a very important point—to be infective the animal must be a victim of the disease. In other words, there are no healthy carriers of rabic infection. This, as you can readily see, would simplify the destruction of all sources of infection, which is not easily possible or to be desired in other diseases. We here venture to remark with considerable degree of assurance, that with a suitable nationwide law, and a complete cooperation of the states, rabies would become a medical curiosity. State laws, very desirable as a support to a federal statute, are in themselves inadequate. Interstate quarantine against dogs is obviously impossible. They do not travel along the conventional routes of traffic. This is exactly the difficulty presented just now in the southern New England States. No doubt the state authorities are attempting to limit ingress of dogs across their respective boundaries, but as is to be expected, the efforts have proved to be of no avail. Our geographical position would render the task more difficult than in island countries, such as Great Britain and Australia, but there is no question but that the ideal condition is attainable and this only through a persistent and energetic and widespread educational campaign.

State and city ordinances for control of rabies are of next importance, and supplementary to federal laws. These should require the reporting to the health authorities all dog and cat bites, and bites of other animals susceptible to rabic infection. They should compel complete extermination of all stray animals. A dog muzzling law, defining what a suitable muzzle is, must be continuously and rigidly enforced. New York city has long required the reporting of dog bites to the health department, but a muzzling law has only been adopted since the fall of 1914. As to gathering in stray animals, the efforts have only been sporadic, stimulated from time to time by sudden increases in the occurrence of the infection.

If one can depend on figures, the muzzling law adopted in 1914 has produced a notable decrease in the number of dog bites, the number of antirabic treatments, the percentage of positive rabid dogs, the number of dogs' brains examined, and in the occurrence of human rabies. In Buffalo, where for the past year and a half an epizootic of the disease has occurred, diminution of rabies has been produced by rigid enforcement of a muzzling ordinance. However, with danger apparently over, the enforcement of the muzzling ordinance slackened up considerably. This was followed by a recrudescence of the disease. The incubation period of canine rabies is very variable, the average being fifteen to sixty days, but it may be as long as one year. In this respect, it is very unlike the incubation periods of the acute exanthemata, which are definite, within rather narrow limits of time. In these diseases, after definite period of incubation has passed, the exposed persons may be released from quarantine. Not so with rabies; the incubation period is too indefinite. Therefore, effective measures must be constantly employed to combat the insidious peril.

That muzzling dogs and gathering up the strays is effective in combating the spread of rabies, is demonstrated by these charts. Chart I shows curves

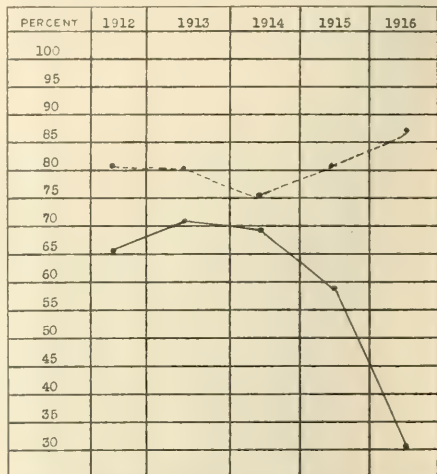


CHART I.—Showing number of persons treated at the antirabic laboratory, 1912-16.
In the city Out of city.....

representing the number of persons treated by the antirabic laboratory in New York City, and also out of the city for the five year period of 1912 to 1916 inclusive. The continuous line represents New York curve and the interrupted line, cases from out of town. It will be noted that for the years 1912, 1913, 1914, the number of persons treated in New York are at approximately the same level. In the fall of 1914, the muzzling ordinance was put into effect, after which you will note the sudden and sharp decline in number of persons treated in the city during 1915 and 1916. The out of city cases show a gradually descending curve for the corresponding period of time. This might indicate that out of the city, where there may not have been effective dog muzzling laws, the incidence of rabies was diminishing apparently without intervention of antirabic agencies. However, that is not true of the years 1912, 1913, 1914 in New York city, where the number of persons treated was about the same for each of the three years. As will be noted, there occurred an almost precipitous drop in 1915 to less than fifty per cent. of persons treated in 1914. While it is possible that the natural decline in rabies as shown by the out of the city curve may have had some effect on the New York curve, the decline after the muzzling law was put into effect is too sudden to give the natural decline very much credit in producing diminution of the number of persons treated in New York city. It appears to be a striking example of cause and effect.

Chart II shows the curves of percentage of persons bitten by positive rabid animals. You will note here that the curves diverge and that the out of city percentages are higher. This may mean that either out of city officials are more expert in getting the biting animal or that the people of New York

city have been better educated concerning dog bites, and have more convenient facilities for obtaining proper care. Personally, I feel that it is the latter

appearance. Muzzles must be kept on the animals not only on the street, but also when in the house. Rabid pets are a greater menace to their owners than they are to persons on the street, because contact is more intimate. The menace of rabies will be with us until an intelligent and widespread cooperation can be effected between the national, state, and town health authorities, and most important of all, the individual owners.

The usual procedure in the handling of dog bites in New York City is as follows: The name and address of the owner of the biting animal together with the name, age, and address of person bitten, are reported to the veterinary division of the Bureau of Preventable Diseases. A sanitary patrolman is instructed to investigate the case. If the dog is alive and circumstances of bite are suspicious, the dog is removed to the nearest A. S. P. C. A. shelter for observation by a veterinary surgeon from the Department of Health. A primary inspection is made upon receipt of animal and final examination is made at the end of a week or ten days. If the biting animal has been killed, the carcass is sent to the Bureau of Laboratories and the brain searched for Negri bodies. On many occasions, the sanitary patrolman may dispose of the case when the circumstances of the bite are such as to leave no doubt as to the health of the dog. The person bitten is instructed to appear at the proper borough antirabic clinic for advice and treatment if necessary. All Manhattan and Richmond cases are referred to clinic at 139 Centre street; all Bronx cases to Bronx Borough headquarters, St. Paul's Place; all Brooklyn and Queen cases to Brooklyn headquarters, Willoughby and Fleet streets. The clinics are in charge of experienced physicians, who, from the circumstances of the bite and behavior of the biting animal, determine in the individual case whether or not he ought to be treated, and if treatment is necessary, it is applied.

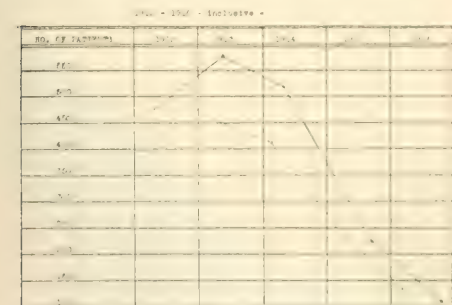


CHART II. PERCENTAGE OF PERSONS BITTEN BY DOGS IN NEW YORK CITY, 1912-1916, INCLUSIVE.

element that has produced the difference in percentages. The wide newspaper publicity accorded the application of muzzling ordinance had a wholesome educational effect upon the public as to the dangers of dog bites and how to prevent such dangers. A direct index of effectiveness of a muzzling law could be furnished by figures for biting dogs gathered in by the department of health in a similar period of five years.

Chart III presents these figures. It will be noted that for the first three years there has been a slight

CHART III.

NUMBER OF DOG BITES AND OCCURRENCE OF ANIMAL RABIES IN NEW YORK CITY, 1912-1916, INCLUSIVE.

	1912	1913	1914	1915	1916
Total bites	1197	1306	1176	964	1237
Dog rabies	239	169	138	114	24

increase in dog bites, but in 1915, the first year of muzzling law enforcement, there was a diminution of eighteen per cent., and in 1916, a drop of twenty-seven per cent. in the number of dog bites. The chart shows an even more remarkable decrease in incidence of canine rabies among these animals. In 1914, you will note there were 318 rabid dogs; in 1915, the first year of our dog muzzling experience, there were 113 rabid dogs, a decrease of sixty-four per cent. In 1916, the number dropped to twenty-four, or a decrease of ninety-two per cent.

Much still remains to be done to make the muzzling ordinance more effective. There should have been a much more marked diminution in the number of the biting animals. Every one of us sees in the average of two to six unmuzzled or improperly muzzled dogs a day, depending upon the parts of the city visited. An improperly muzzled dog might just as well have no muzzle. The ordinary "figure of 8" leather muzzle will permit the dog to open the mouth to some extent. If a dog can protrude his mouth through a muzzle and open it, he can bite. Such a muzzle is only a makeshift to evade the full meaning of the law, or is evidence of ignorance on the part of the dog owners. The Municipal Court of the City of New York held that the muzzling law required a muzzle that would prevent biting. The wire basket muzzle, or the muzzle such as I have here, is effective, humane, and has a more handsome

CHART IV.

PERCENTAGE OF PERSONS BITTEN BY DOGS IN NEW YORK CITY, 1912-1916, INCLUSIVE.

	No.	Pos.	No.	Pos.	Total	%
1912	1197	239	1913	169	1306	12.9
1914	1176	138	1915	114	964	11.8
1916	1237	24				1.9

It sometimes requires considerable questioning to obtain an accurate history. Many times persons bitten are too young to furnish reliable histories, and particularly if no trace of the dog is found, one may have to advise treatment, which an intelligent history would have made unnecessary. Bites by stray dogs when inflicted without provocation are considered suitable for antirabic treatment. The behavior of the dog is the important point in the determination of whether or not bitten persons should receive treatment. For this reason, when possible, the dog should not be killed, but caught and put under observation of a competent veterinary. However, if the circumstances are suspicious, the person bitten is put under treatment without waiting for a veterinary or laboratory diagnosis. If the examination of the dog by veterinary, or brain for Negri bodies (in case of killed animal) is inconclusive, it proves positive, valuable time will not have been lost. There are times when examination of brain for Negri bodies is inconclusive. Then resort must

be had to animal inoculation of the suspected material. This requires ten days to two weeks for results, which would be disastrous in some cases.

The clinic physicians are extremely careful in sifting out the cases that deserve treatment. It is not urged upon all persons bitten by dogs, but only in those cases in which it is indicated. Besides the discomfort and loss of time attendant upon receiving a course of twenty-one injections, figures show that about one in 500 treated persons develop varying degrees of neuritis and sometimes, though much more rarely myelitis, which may lead to death from the treatment itself. Therefore, it would not be advisable to urge the treatment on all dog bite cases. At times, cases present themselves which from the history do not need treatment, but persons insist on having it. In such cases they must sign release before it is administered. On the other hand, some persons who need treatment, after two or three injections, do not appear again. A sanitary patrolman is sent to the person's house to urge the continuance of treatment, and if he refuses, attempt is made to get release. Some persons needing treatment refuse same at the first consultation and an attempt here is also made to get person to sign release.

What facts in the conduct of the biting animal are important in making a probable diagnosis of rabies? When a dog shows marked change in habitual disposition without apparent cause, rabies should be thought of. The dog may become more sullen or he may become unusually affectionate and playful. He may be "off his feed." There may be a change in the character of his voice. He then becomes restless and more excitable. He may run away from home and return in a day or two bitten, emaciated, worn out. Then he may have convulsions and finally paralysis sets in, first the hind legs. The jaw drops from paralysis of the jaw muscles. There is drooling of saliva, and the animal dies from ascending paralysis. This is the usual picture of furious type of rabies.

The paralytic form or dumb rabies does not present the activity of the furious type. Many times the dog presents the appearance of having an obstruction in his throat, because of paralysis of throat muscles. An attempt will be made to remove the supposed obstruction and in the act the hand may be bitten or scratched or abraded surfaces contaminated with the infective saliva. Rabid dogs do not have fear of water. It is only when they have paralysis of throat muscles that they present the appearance of having fear of water. In this form, the animal dies of progressive paralysis.

The clinical picture of canine rabies is not a constant. Few of the symptoms above described may be present, but the rule is, when in doubt, treat the case as one of rabid dog bite. In case of extensive face bite, it is often desirable to obtain a diagnosis before cauterizing the wounds with fuming nitric acid. In such a case, a veterinary is dispatched immediately to inspect the animal if alive, or if the animal has been killed, the report of brain smear is awaited before cauterization is performed. This procedure will prevent unnecessary disfigurement.

Wounds inflicted by rabid animals vary in degree of infectivity. Inasmuch as the infectious agent

exists in the saliva, it can be readily seen that bites through the bare skin are much more serious than bites through clothing, the more clothing the less serious the bite, as clothing mechanically removes the saliva. It has been observed that shaggy, long haired dogs are less frequently infected than short haired ones, and that, when infected, incubation period is shorter in the latter. Extensive deep wounds are more serious than small superficial ones because more infective material is introduced and also because it is brought into closer relation to the larger nerve trunks. The infectious material reaches the central nervous system by the perineural lymph channels, therefore, wounds in the neighborhood of large nerve trunks present ready access to this system. Face and head bites are the most serious, because they are nearly always through bare skin; the face is rich in nerves and because of the short distance the virus has to travel to reach the brain. The incubation period is usually shorter in face bites than in bites elsewhere. It is in face bites where delay in application of treatment may be disastrous. Contamination of abraded surfaces with saliva is not as serious as bites through bare skin.

The incubation period of human rabies varies greatly anywhere from ten days to over one year, the average being seventy-two days. The application of a cause of preventive treatment occupies twenty-one days, so you can readily see that if one is dealing with a short incubation virus, say of ten to thirty days, our efforts will be of no avail. However, if it happen to be virus of forty to sixty days' incubation, and a delay of a week or ten days occurs before application of treatment, you can readily see that the case might be lost. It is the virus of short incubation period and delays in application of preventive inoculations which produce most of rabic mortality in cases where antirabic treatment has been used. In some very few instances the rabic virus has a very prolonged incubation period. In such cases, fortunately few, the immunity conferred by the course of injections has disappeared before the virus produces symptoms. We have had two such cases in the past two years, one in which incubation period was $1\frac{1}{4}$ years, and the other a period of seven months.

The specific measures in prevention of hydrophobia consists of thorough cauterization of wounds with fuming nitric acid, and administration of a series of twenty-one subcutaneous injections of antirabic vaccine on successive days.

Cauterization should be thorough and applied as soon as possible after the biting occurred, and at any time up to seventy-two hours of time of biting. This destroys any accessible virus and tends to diminish severity of infection. Cauterization, no matter how soon applied, is insufficient in itself for the proper handling of a rabid dog bite. It must be always supplemented by the course of injections.

The material injected consists of a saline emulsion of the spinal cords of rabbits that have died of fixed virus infection, to which has been added two tenths per cent. phenol for preservation. Fixed rabic virus is one in which the incubation period has been reduced and fixed by the passage of street virus or virus

removed from animals dying of the natural disease, through a large series of rabbits. This continued reinoculation has produced the effect of making a constant incubation period from what originally was very variable. Rabbits are inoculated intracere-

CHART V.

SCHEME OF PASTEUR TREATMENT AS USED BY DEPARTMENT OF HEALTH, NEW YORK CITY.

Days	Days cord dried	No. of Face cases	injections of Act.	Act.	Phen.	to 6 hours
1	8-7-6	8-7-6	2	3 c. c.	3 c. c.	3 c. c.
2	8-7-6	8-7-6	2	3 c. c.	3 c. c.	3 c. c.
3	5-4	5-4	2	3 c. c.	3 c. c.	3 c. c.
4	5	5	1	2 c. c.	2 c. c.	2 c. c.
5	3	3	1	2 c. c.	2 c. c.	2 c. c.
6	3	3	1	2 c. c.	2 c. c.	2 c. c.
7	3	3	1	2 c. c.	2 c. c.	2 c. c.
8	3	3	1	2 c. c.	2 c. c.	2 c. c.
9	5	2	1	2 c. c.	2 c. c.	2 c. c.
10	4	4	1	2 c. c.	2 c. c.	2 c. c.
11	4	4	1	2 c. c.	2 c. c.	2 c. c.
12	3	3	1	2 c. c.	2 c. c.	2 c. c.
13	3	2	1	2 c. c.	2 c. c.	2 c. c.
14	4	4	1	2 c. c.	2 c. c.	2 c. c.
15	4	4	1	2 c. c.	2 c. c.	2 c. c.
16	3	3	1	2 c. c.	2 c. c.	2 c. c.
17	3	2	1	2 c. c.	2 c. c.	2 c. c.
18	4	4	1	2 c. c.	2 c. c.	2 c. c.
19	4	4	1	2 c. c.	2 c. c.	2 c. c.
20	3	3	1	2 c. c.	2 c. c.	2 c. c.
21	3	2	1	2 c. c.	2 c. c.	2 c. c.

2 to per cent phenol used as preservative instead of glycerine.
Dose in c. c.

brally with one fourth c. c. of a 1-3,000 suspension of fixed virus and on the seventh day after inoculation, they exhibit complete paralysis. The animal is then killed by exposure to illuminating gas. The cords are removed under strict aseptic conditions by the improved Oshida method and hung in desiccating jars over caustic potash. Portion of the fresh cord is inoculated into aerobic and anaerobic culture tubes to test for sterility.

Desiccation over the caustic potash attenuates or reduces the virulence of the cords. The maximum period of desiccation is eight days and no cord is used in making up treatment, which is dried less than two days. These cords are hung in a room with a constant temperature of 68 to 72 F. As in antityphoid inoculation, a small quantity is used to begin the treatment and is constantly increased. However, in the antirabic treatment, the volume of material is greater at the beginning of the course than at the end, but the potency of the material injected is gradually increased. Thus a cord dried for eight days is inert, one dried for seven is more virulent, one dried for six more virulent than a seven day cord and so on down. In the first two days, six c. c. of a mixture of eight and seven and six day cords are used. On the third day six c. c. of a mixture of five and four; on the fourth day two c. c. of a five day cord is used and so on until two day cord is used. There is a series of repetitions of the stronger cords until the twenty-one injections have been given. For ordinary bites, nothing stronger than a three day cord is used. For face bites and extensive deep wounds, two day cords are used. We had at one time used two day cords in courses for all bites, but an unusual number of cases of treatment neuritis occurred which caused us to reduce the intensity of the treatment and results have justified the change. The more intensive treatment is now only used in the more serious bites.

The technic of the injection is the same as for hypodermic injections of any other material. We generally advise injections in the abdominal wall

over the recti muscles above the belt line. Care must be taken not to introduce it into a bloodvessel and as far away from nerves as possible. In the first three days, when six c. c. each is used, the treatment is given in two injections of three c. c. each, one on each side of the abdomen. If proper aseptic precautions have been observed, the only ill effects that may at times result from the injections are indurations and erythemas. Application of wet dressings is indicated if such occur. The person under treatment must be advised not to indulge in any strenuous exercise, suffer excitement, shocks to the nervous system, undue exposure to cold and wet. In very severe, extensive bites, in addition to administering the intensive treatment, we advise a repetition of the entire course about two weeks after the completion of the first course. This is done to reinforce the immunity conferred by the first course.

The results of antirabic treatment are striking. Doebert in 1909 reported a mortality of 14.8 per cent, in a series of 122 untreated persons who were significantly bitten by positive rabid animals. Cases of bruises and of bites by animals not proved to have been rabid were excluded in these statistics. Bravner in the United States reported a mortality of twenty per cent. in a series of eighty untreated cases. Others think that about ten per cent. is the true mortality figure in untreated persons bitten by rabid animals. The mortality in persons bitten by rabid animals who have undergone treatment is, roughly, one per cent. Of these, one half die of rabies within fifteen days of the completion of treatment; the other half is made up from cases in which there have been delays in application of treatment and from cases with prolonged incubation periods. There is no method of inoculations used at the present time that can be introduced sufficiently early to take care of short incubation infections. The value of antirabic inoculation stands unassailable. Without the treatment about fifteen per cent. of persons bitten by rabid animals develop rabies. With the treatment, only one per cent. of persons so bitten succumb. This should be a striking argument against those who do not believe in the existence of hydrophobia.

When the symptoms of rabies appear in the human being, it is too late for application of preventive measures. In fact, it is too late for any measures except for those that will ease the agony. The only measure that is of any value is the application of antirabic treatment at the time of the dog bite. Prevention is the only method that will work. Some few cases have been reported as cured from time to time by quinine and phenol injections, but the diagnoses have never been absolute. Hysteria simulating rabies may be very difficult to differentiate from true rabies, but a person suffering from hysteria does not as a rule die, whereas the true sufferer from rabic infection always dies and quite promptly, anywhere from three to five days after onset of symptoms. The late Dr. F. S. Fielder reported use of quinine and phenol in several cases without any results, except to increase the suffering of the victims. The thing to do is to ease up the agony by sufficient sedatives.

The disease in the human is most easily recognized

in the early stages. In the later stages with onset of paralysis and clouding of sensorium it is difficult to differentiate from bulbar palsy in poliomyelitis except by history of dog bite. Even spinal fluid examination may not help because spinal fluid from rabies may show changes not unlike that found in fluid from poliomyelitis. The early stages present a condition of uncalled for anxiety, nervousness, and melancholy, headache which prevents sleeping, dozing for a short time, then waking up with a start, all atremble. The patient may begin to feel a sense of constriction in his throat gradually increasing in intensity. The sight of water produces spasm of throat muscles.

On examination, the last case I saw presented a healthy looking, rational man. The palpebral fissures seemed wider, so that more of the sclera was visible than normal. He had a staring expression. A scar was present in his right eyebrow at the site of the wound inflicted by the rabid dog. He had subfebrile temperature and pulse of 96. The deep reflexes were exaggerated. His skin was hypersensitive to air draft. A gentle zephyr blown onto his neck produced a spasm of the throat muscles. Offering him a glass of water set his throat into a spasm. The man was thirsty. He had had no water for nearly twenty-four hours. His eyes were eager for water. He reached for the glass but did not take it. It was very pathetic. Just forty hours after I saw this apparently healthy robust man he was a corpse, having suffered the tortures of the damned in that brief space of time. He retained consciousness almost to the end. The symptoms in those cases that die in spite of treatment may be somewhat modified. A child that recently died in Newark fifteen days after completion of treatment was able to swallow liquids and mushy foods but with great difficulty.

Paralytic or dumb rabies in man is rare. It represents the end stages of rabies of the furious type in which there is an overwhelming infection of a very virulent virus, which involves the lower cord and ascends much after the manner of the ascending type of anterior poliomyelitis.

In closing, I want to say that if any of you are ever unfortunate enough to have to care for a case of human rabies, you will then realize to the fullest degree, why too much time, energy and money cannot be spent in a nobler purpose than the eradication of a disease so terrible and yet so easily preventable.

40 WEST EIGHTY-FOURTH STREET.

Pruritus Ani.—Dwight H. Murray (*Interstate Medical Journal*, April, 1918) reports twenty additional cases of pruritus ani making a total number studied of one hundred and forty-three. After six years research work, confirmed by others in America and Europe, he considers that he is justified in claiming that the etiology of pruritus ani is a skin infection and the usual infecting microorganism is the streptococcus fecalis. Vaccine treatment has given satisfactory results. If rectal pathology is present with anal skin infection an operation will not cure the pruritus and vice versa. There may be a complicating infection of the anal skin by the staphylococcus or colon bacillus.

DEFECTIVE VISION: ITS PATHOLOGICAL SIGNIFICANCE.

BY A. GUMBINER, M. D.,
New York.

The art of refraction is little understood by the great majority of the profession. To them it is often only "the fitting of glasses"; a mechanical method of replacing one lens with another until the patient halts the procedure by admitting that with the last lens he sees best. Another current ruinous fallacy is the idea that lenses can and should rectify defective eyesight at any time and that delay here is a factor that should cause no apprehension; further, that speed should only be exerted in manifestly acute inflammatory cases.

Refraction means much more than the fitting of glasses. It embraces, not alone a thorough understanding of the physics of light and its action on the dioptric system of the eye, but a thorough knowledge of concurrent affections which in a great many instances are directly traceable to refractive errors. Also, the simple symptom complaint of poor vision very often leads one to the unearthing of ocular and general conditions heretofore unsuspected.

I maintain that there is no organ in the human economy where the baleful influences of disease processes hold fuller sway, or that show fewer subjective symptoms, such as pain, redness, and heat, than do the organs of sight. The cardinal symptom to attract attention is diminished vision. It is the first in a great many of the intraocular affections to lead to their final discovery which otherwise would be delayed. Yet it is this very symptom that should be so apparent in its meaning both to physician and patient that is oftenest neglected. The importance, then, of treating each case of defective vision as one demanding something more than the fitting of glasses should be strongly borne in mind.

Let me call attention to the purely functional cases of refractive errors. These may be divided into two classes: Class I comprises the benign forms. They have standard vision, plus symptoms of reflex eyestrain. These conditions are easily remedied by proper refraction and the wearing of glasses. The patients will read 20/20 or 20/15 at a distance of twenty feet and complain of blurring distant and near vision. The fault here lies in an excessive use of the accommodative faculty inherent in the ciliary muscle. This muscle is in a state of constant contraction and partial relaxation. The muscular effort to see well brings on hyperemia, congestion, and fatigue. Patients with this form of ametropia, or defective vision, suffer from headaches, tired eyes, blepharitis, hordeolum, and a syndrome of other reflexes. They seek early relief. Class II embraces the more serious cases of refractive errors, those with an insidious onset and pursue an apparently quiescent course, the main symptom being poor eyesight. This may be congenital or acquired in early puberty or adolescence. It is principally in these cases in which the failing vision is so noticeable, so incommoding to the patient, and so rapidly progressive, where the negligence is greatest and the condition permitted to enter on the borderline of malignancy.

Experience shows that failure to correct such a function is primarily due to ignorance and vanity on the part of some males and of most females. Especially recreant in this respect are the parents where the children are concerned, for many mothers entertain a horror of their offspring, especially their girls, wearing glasses.

CASE I.—Mr. H. R., aged thirty-three years, storekeeper, an intelligent man, came to see me about his daughter, age seven years, who had been sent home from school for defective eyesight. It was not the father's intention to consult me about himself. While the daughter was reading the chart from a distance of twenty feet, I noticed the parent, who was standing behind her chair, trying hard to discern what the child was reading. Her vision was reduced to 20/70 in each eye, improved to 20/40 with lenses. Later, after much persuasion, I examined the father. Vision in right eye was down to 10/200, and in left eye to 5/200. His reading matter had to be brought to within five inches of his eyes to discern it at all. He gave a history of poor sight as long as he could remember; he had never worn glasses, was never advised to do so, and as he suffered no more serious inconvenience than poor vision he never consulted an oculist. Minus glasses improved his vision to 20/40 in the right and to 20/50 in the left eye. His near vision improved somewhat with a weaker minus lens before the right, and showed no improvement before the left eye. Fundus examination revealed pathological changes: large posterior staphyloma, spots of choroidal degeneration in both eyegrounds.

This man was slowly progressing toward complete blindness and did not realize it. Treatment in this case, proper glasses, good ocular hygiene, constitutional medication, tonic and alterative in character, would operate to stay the progress of his trouble and in time show improvement in vision.

CASE II.—Mrs. L. G., aged forty-three years, housewife. All her children wear glasses for myopia, one as high as a minus five. She consulted me about some acrid discharge that had excoriated the skin about the outer canthus of her right eye. She also complained of a burning and itching sensation in that region for the past two weeks. Her personal history elicited the fact that she had had poor vision all her life, had worn glasses ten years previously for a period of two months, then discarded them from motives of personal vanity. Although her vision continued to fail, she never consulted an oculist until her visit to my office, and then because of the acute manifestations as evidenced by the redness and slight conjunctival discharge. She then, for the first time, began to entertain a real fear about losing her sight. Upon examination, I found at twenty feet distance a vision as low as 7/200 in both eyes; near vision very defective. Improvement to 20/70 in both eyes with minus six and seven lenses and then imperfectly. Ophthalmoscopic examination showed marked stretching of the eye tunics away from the optic discs, choroidal degenerative changes visible throughout both fundi. The left eye contained many fine floating opacities in the vitreous.

These two cases are illustrative of those insidious functional refractive errors which, if treated at their inception, would have gained for these patients almost normal visual acuity and kept them away from the borderline of the malignant and truly pathological types of ocular disease. These and hundreds of similar ones met with in the routine work of private and hospital practice among oculists should suffice to bring home to the family doctor the need of deeper interest in patients who voluntarily, or, in the course of routine history taking, complain of failing vision.

Such simple and obvious signs as wide, immobile pupils, drawing reading matter close to the eyes, or the bending of the head close to an object to

discern it distinctly, narrowing of the palpebral fissures for distant vision, rotation of the head to one side in viewing an object at close range, a sign that patient is attempting to use a seeing to the exclusion of a non-seeing eye, are significant of ocular disturbances and should stimulate further investigation. Let me direct attention to cases of diminished vision dependent upon strictly pathological conditions residing either in the eye itself, the optic nerve tract, or adjacent structures, such as the nasal accessory sinuses, or in constitutional disturbances. Here again the principal, and often the only symptom noticeable is defective vision, either of sudden or gradual onset. Anatomically the ocular globe measures one inch in circumference and twenty-four millimeters in diameter, anteroposteriorly. It lies in the bony orbit embedded in areolar tissue, held freely in place by six extraocular muscles which control its movements. It is composed of four refracting media, viz., the anterior surface of the cornea, the aqueous humor, the anterior surface of the crystalline lens and the vitreous. It has three enveloping tunics, viz., from without inward, the sclera, its supporting membrane, the choroid, its vascular membrane, and the retina, its visual membrane. In addition it has the ciliary body and iris diaphragm situated anteriorly and controlling the quantity and character of the visual acuity. The optic nerve, which merges into the retinal layer posteriorly and traverses a circuitous course into the occipital lobes of the brain, the centers for vision, transmits the visual impressions. Anywhere along this pathway disease processes may exist, deteriorating the visual power, and yet manifest little or no symptoms other than disturbed vision.

A child may be brought to your office, or be sent home from school with a complaint of poor vision, or that he sees a dark spot in front of one eye. A superficial examination will show nothing pathological, but upon closer examination with a loupe and reflected light a fine nebular opacity of the cornea will come to light that from its situation relative to the pupillary space has completely or partially obscured the visual rays. Further investigation and a von Pirquet test will show a positive reaction for tuberculosis. Early and persistent treatment has succeeded in curing many of these cases.

Particularly insidious in their onset are some cases of interstitial keratitis, for which so much can be done upon early treatment. Here, too, the parametacarpal vessels are a gradual or sudden disturbing of vision. The patient may complain of a film before the eye and some photophobia. Here is a case

glasses had improved to 20/50. She was again refracted under a cycloplegic and given colored glasses, which improved her vision to 20/20. A year after her first visit her condition remained the same, although a Wassermann test showed a weak reaction.

Another insidious disease is chronic glaucoma. The striking symptom is loss of vision. The full importance of which may not be recognized until irreparable damage has been done. I give the following history from memory, as I could not trace the patient's record in the card index:

CASE IV.—A colored man came to the Manhattan Eye, Ear, Nose, and Throat Hospital over a year ago. He was dressed in the uniform of the United States army, and complained of poor sight, for which he had been sent to the hospital. Four months prior to my seeing him, which was the time he entered the service, his eyesight began to fail. He obtained glasses at an optician's, which did not help him much. His sight continued to grow worse until he could no longer perform his army duties. Upon examination, a full fledged case of chronic glaucoma in both eyes was revealed. Tension with tonometer was plus $++$. Vision in O. D. down to almost nothing, and in left eye to 20/40.

CASE V.—M. N., jeweler, aged sixty-six. Three years ago he noticed a "smoke" before his eyes. Thinking that he needed glasses, he went to an optician, who told him he had beginning cataracts. He prescribed a pair of glasses and advised the awaiting of the ripening of his cataracts. His sight grew worse, and it was three years later that he felt bad enough to consult an oculist. He was brought to me in almost helpless condition. Examination revealed the absence of any lenticular changes. Instead there was a fully developed case of glaucoma in both eyes. Vision in O. D. fingers at two feet. Vision in O. S. absent. Light perception and projection fairly good in right eye, absent in left. Urinalysis revealed both albumin and sugar. Blood pressure 160.

This condition if recognized in its incipency and properly treated would have staved off blindness. The following case is another striking example of ocular neglect:

CASE VI.—Mr. S. B., aged thirty-four years, an insurance agent, an intelligent man, came to see me November 25, 1917, more through accident than his own volition. Personal history: had gonorrhea at age of twenty years, no history of specific trouble. Wassermann test, made subsequently, showed a negative reaction. Since the age of twelve years he had been an inveterate smoker, consuming on an average six to eight cigars and one package of cigarettes daily in later years. Ten years ago he noticed a falling off in his keenness of vision, and he had headaches. He obtained glasses at an optician's, with relief for a year, after which time he discontinued their use. His right eye continued to grow worse, but as he saw well with his left eye he felt satisfied. Four months ago he noticed that he had to bring his reading matter closer to his eyes and that his distant vision was growing dimmer (involvement of the left eye). Examination: Vision in O. D., fingers at four inches; no perception of light. O. S. V., 20/40, unimproved by lenses; light perception absent in temporal half of field. Form and color fields contracted. Ophthalmoscopic examination showed the nerve heads decidedly pale. Progressive optic nerve atrophy was diagnosed.

This man had been growing gradually blind over a period of years and was unaware of it although his occupation brought him in daily contact with physicians.

Cases of defective vision both for distance and near occur in young adults between the ages of twenty and thirty years, and go unattended for considerable periods, or are given useless glasses by an optician and finally reach the oculist. Upon wide dilatation of the pupils with a cycloplegic incipient cataract is discovered. Its occurrence at so

early an age should suggest urinary analysis which often reveals the presence of sugar. According to De Schweinitz sugar is found in one per cent. of all cataract cases. It is well known to all physicians that chronic nephritis is often suspected and discovered upon a fundus examination in patients complaining of some disturbance in vision.

Defective eyesight has often carried the oculist into the regions of the nose and the nasal accessory sinuses, bringing to light long standing nasal disease which has proved directly responsible for the eye symptoms. This is accounted for by the intimate anatomical relation between orbit and nasal sinuses and the thin bony walls that separate them. Thus empyema of any of these sinuses may by direct extension through the walls or through the lymphatic circulation give rise to refractive errors or aggravate existing ones, and are occasionally responsible for such serious conditions as optic neuritis, neuroretinitis, and optic nerve atrophy. Therefore, if a patient complains of disturbed vision and nasal catarrh, both organs should be subjected to close inspection. Where the nasal disease is more marked than the ocular, the nasal condition is to receive first attention and very often proper treatment of the nose will cure the ocular symptoms.

CASE VII.—A young civil engineer came to me complaining of an annoying pain in both eyes. He had been given glasses four years prior to his visit, but without result. Vision in each eye was 20/15. He also complained of nasal discharge. Refraction under atropine revealed a small amount of astigmatism, for which he had been given glasses without relief to the symptoms. Examination of the nose showed pus in both middle meati. The roentgenograph showed cloudiness over the left frontotol and left antrum. As he also suffered from organic heart disease, I elected to do the more conservative procedure of removal of the middle turbinates, curetting the ethmoids on both sides. This, with probing of the fronto-nasal canal and irrigation, gave him considerable relief, and his eye symptoms disappeared.

CASE VIII.—Miss A. F., telephone operator, age thirty years, complained of poor vision and supraorbital headache. Vision in O. D., 20/70; O. S., 20/20, not fully. The retina and optic nerve were quite hyperemic. Refraction showed a small amount of myopia, and her vision was improved with a weak minus lens to 20/20 in either eye. Her headaches continued, and her eyes did not feel comfortable with her glasses. Incidentally, she complained of a slight acne on her face. As she used her handkerchief frequently, I examined her nose, and found a large cystic middle turbinate on the right side, the side of the defective eye. Pus showed from underneath it. I advised operation, to which she consented. The offending turbinate was removed, and proved to be but a hollow shell. I also curetted the ethmoid sinus on that side, with the result that her headaches and acne disappeared, with improvement in her general health. Vision in the right eye went up to 20/30 without lenses.

In conclusion I need only observe that poor eyesight is so prevalent a complaint that the public and general physician have assumed an apathetic attitude toward it. In an apparently simple case of defective eyesight a blighting disease may exist.

Physicians should inquire closely into the visual power of all patients and not accept their statements upon the matter as final. Every physician should supply himself with a Snellen's test type card, and all cases of defective eyesight should be referred to the proper sources for further investigation and treatment.

207 WEST 110TH STREET.

SARCOMA OF THE CORPUS CALLOSUM.

Case Report.

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New York,

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The significant points in the case are:

Heredity, parents, brothers, and sisters dying young; insanity and headaches in the mother; and tuberculosis in the three brothers. Repeated injuries of the head and convulsions, hysterical in type, appearing years after the injuries. It is possible that the first and second played a rôle in the development of the neoplasm. Hallucinations of taste, possibly from indirect involvement (pressure) of the uncus and hippocampal regions on the left. Twitching and later paralysis of the right hand, and astereognosis especially in the right hand, which were the chief localized signs. The alternately slow and rapid pulse, and the Cheyne-Stokes' respiration, both of which fit well with the increased intracranial pressure found at operation. The comparatively low blood pressure represented probably vasomotor exhaustion.

CASE.—J. M., forty-seven years; structural steel worker.

When seen on June 13, 1917, complained chiefly of generalized headache intermittent in character and present usually on awaking. Latterly vomiting accompanied the headache attacks. Onset of the headaches dates two years ago.

Family History: Father died at forty-nine years; mother, who was subject to headaches all her life, died at forty-seven in an insane asylum. Had four brothers, three of whom died of pulmonary tuberculosis and one from accident. Had four sisters, all of whom are dead. Not known whether brothers and sisters were subject to headaches. Personal history: In his work he received many injuries of the head. Twenty years ago one of these caused unconsciousness. Fifteen years ago was sandbagged and beaten, although not rendered unconscious; some teeth were knocked out and severe inflammatory reaction set in at the site of injury on the scalp. Habits good. Never used alcohol. Ten years ago had convulsions which lasted two hours. These convulsions were preceded by crying spells, so that the patient believed he was going to have another convulsion a few days ago because he had a crying spell. As far as the patient knows the special senses were always normal except for the last seven weeks when he has experienced hallucinations of taste.

Present illness: For the past two years has suffered from intermittent generalized headaches, which became progressively more and more severe. Latterly these have been attended by vomiting. For some time past the right arm and leg have exhibited a marked weakness; staggers to right in walking. Within the past three weeks the right arm and hand began to twitch involuntarily. Since the onset of the headaches the patient has become progressively irritable and impatient, showing at times impairment of concentration and memory and hallucinations (of taste) and delusions (poison in his food).

Examination showed: General: Robust, muscular man of middle age; pulse 64, accelerated to 68 during exacerbation of headaches; bloodpressure, systolic (auscultatory) 115, diastolic, 100 mm. Hg. The respiration was of a modified Cheyne-Stokes' type, the rate varying from seven to thirteen per half minute. Thoracic and abdominal viscera, urine, etc., normal. Neurological—Motor: Is slow in starting a movement in the right hand, e. g., in squeezing or touching hand to forehead, but executes the movement with good and sustained power. No paralysis in the cranial or spinal nerves. Bladder and rectal functions unimpaired, but just before operation on June 15, there was

urinary retention, and the patient could not move the right hand. Reflexes: Epigastric and abdominal absent on right and left. Cremasteric impaired on left plantar. Oppenheim and Gordon all showed flexor response (all toes) on right, whereas on left the small toes showed flexion or "fanning" while the hallux remained stationary. Sensory: Spontaneous phenomena; headache as described. Elicited phenomena; difficult to obtain owing to patient's condition (pain, etc.). No gross loss for touch, pain or temperature. The left calf (pressure) and sole (stroking) were much more sensitive than the right. Posture and passive movement were impaired on both sides, but more so in the right for toes, knees, hip, wrist, fingers, etc. Patient was unable to imitate with the left hand posture and position of the right. Coordination: The finger-nose test was poorly performed on the right (eyes open). The Barany pointing tests were fairly well performed on the left, but very poorly on the right. Stereognosis: Impaired in both hands, especially in right. A coin in the left hand was called a vial, but after many tests the patient said it was "something to buy a drink with."

Special senses: Eyes: Pupils and pupillary reflexes normal. Disc choked in both eyes, more so in the right. Fields for rough test showed noticeable contraction. Ears: Hearing watch, right ear six inches—left ear, twelve inches. Weber lateralized to right, caloric tests at 78° F. showed in each ear normal reaction. Smell: Impaired in left nostril despite a slight obstruction in right nostril. Taste: Impaired in left side of tongue, compared to right. Speech: Slow, but articulation clear, and enunciation perfect. No sensory or motor aphasia except perhaps that related to the defects noted under astereognosis. Auscultatory percussion of head gave no definite information, the only thing found was a doubtful area of dullness over the left frontal region. Blood: Wassermann negative; spinal fluid not withdrawn for conservative reasons. X ray, negative. Summary: General symptoms: Headache; choked disc; vomiting; irritability: failure of memory and concentration.

Local symptoms: Right sided hemiparesis, twitching of right hand; general slight impairment of sensibility (pressure pain, posture and passive movements) more marked on right; astereognosis especially on right; smell and taste impaired on left; hallucination of taste. Diagnosis: Anatomical: Sub-cortical lesion under the left Rolandic region, corresponding to the right hand area. Etiological: Neoplasm, nature doubtful. Operation was advised. Operation June 15, 1917, Mitchell Hospital, by Doctor Harrigan.

Nitrous oxide, ether narcosis (Doctor P. J. Flagg). The entire scalp was shaven; iodine preparation. The head was placed on a medium sized sandbag. A large quadrilateral flap was turned down on the left side. The lower margin of this flap measured approximately 3 inches, and the centre of its base was directly over the auditory meatus. The superior border of the flap measured about 5½ inches long, and was parallel to the sagittal suture. It was placed about three-quarters of an inch from the median line of the vertex of the skull. The bleeding points in the flap were caught with Kocher clamps, on each angle of the flap the skull was opened with a Doyen burr. An additional burr opening was made in the centre of the superior margin of the flap. The bone intervening between the five burr openings was divided with a de Villbiss forceps. This was accomplished with some difficulty owing to the great thickness of the skull. At one point in the upper border of the flap it was found necessary to use a chisel in order to complete the division of the bone. The flap was turned down in the usual manner by inserting two chisels close to the lower angles, and exerting pressure and fracture, breaking the bone. The lower margin of the flap was then smoothed away with rongeur forceps, according to the technic employed by Fedor Krause. Nothing abnormal was noted in the dura, the brain did not protrude. The dural flap was fashioned; this base was directly opposite to that of the osteoplastic flap. The bloodvessels in the flap were ligated with black silk, passed through the dura with a small Lane needle. A large area of the cortex was exposed. A portion of the brain protruding into the centre of the wound appeared particularly soft. The dura was extremely adherent to the brain in the region of the longitudinal sinus. There were numerous multiple dis-

along the course of the veins of the cortex. The brain was extremely adherent to the falx cerebri. The entire surface of the hemisphere and the base was completely and thoroughly explored with the index finger which could be passed from the tip of the frontal to the tip of the occiput. Nothing abnormal was noted. During the operation the anesthetist reported that the patient's condition was not satisfactory. An intravenous infusion was given. Bleeding from the surface of the brain was effectively stopped by transplanting a piece of the muscle as advocated by Cushing. The brain was punctured with a hollow needle in four different places. Nothing abnormal was obtained. The dura was sutured in part, and a portion of the bone in the flap removed in order to permit decompression. The scalp was sutured with interrupted silk worm gut. The patient was returned to bed. Camphor and Murphy drip administered. He never regained consciousness; the pulse increased in frequency. Pulmonary edema developed. Death took place sixteen hours following operation. The brain was removed eight hours after death.

After death the brain was sectioned vertically by Doctor J. S. Larkin, and the sections studied serially. A tumor, roughly measuring 8 x 6 cm., was found in the white matter of the left hemisphere, extending from beneath the cortex of the Rolandic area down into the corpus callosum and backward into the occipital lobe. The mass of the growth in the left hemisphere was situated caudad to the basal ganglia (which were not anywhere involved), but extended outward cephalad, where it approached the cortex.

Microscopical Diagnosis. Infiltrating mixed cell sarcoma. In a similar case a primary decompression would probably best meet the indications, leaving more radical measures for a subsequent occasion.

244 WEST TOIST STREET.

TETANY.

By C. E. HYDE, M. D.,
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Chronic Tetany in Adults.—Tetany is a clinical syndrome due to insufficient function of the parathyroid glands, characterized in its outspoken form by: paroxysmal tonic contractions, often painful, usually confined to certain definite groups of muscles, and unaccompanied, as a rule, by loss of consciousness; paresthesias in the extremities; certain trophic disturbances (hair, teeth, nails, lens); and certain signs that can be experimentally elicited, dependent upon overexcitability of the nerves, including the Trousseau phenomenon, the Chvostek phenomenon, and Erb's sign. This definition of tetany by Barker is an excellent one.

History.—Steinheim, in 1830, described some of the symptoms. In 1831, Dance described it as intermittent tetanus, then under that of essential contracture, or contracture of the extremities. About the middle of the last century, the disease occurred in epidemic form in Paris, in the prisons of Belgium in 1846, and in a girls' school at Gentilly in 1876. As a result of Corvisart's studies, he gave it the name of tetany in 1852. Trousseau, in 1860, discovered the possibility of artificially producing the typical contracture position of the hand by placing a ligature on the upper arm, even when the disease was latent. The Viennese clinician, Billroth, in 1880, wrote about the occurrence of tetany after the removal of the whole thyroid for goitre. Since then much experimental work on animals in various countries, by Schiff, Sir Victor Horsley, von Eiselsberg, Halsted, Kocher, Sandstrom, Gley, Kohm,

proved that tetany following thyroidectomy is due, not to the loss of the thyroid function, but to the loss of function of the parathyroid glands simultaneously removed. Animal experiments by Jeandelize, 1902; Pineles, 1904-1907; Erdheim, 1901-1911; von Freenkel-Horkwart, MacCullum, C. Voeghtlin, show that, in cases of parathyroid insufficiency, living parathyroid glands can be transplanted, and will grow and functionate, at least for a number of years, thus completely curing the tetany. Von Eiselsberg was the first to successfully transplant the human parathyroid to cure tetany. Recently H. Guggisberg removed the parathyroids from rabbits, and then was able to bring tetany at will by injecting placenta extract. This confirms the assumption that the endocrine function of the placenta is invoked in its production. It is significant, he adds, that the so called pregnancy toxicoses are practically never encountered in puerperal tetany cases. The parathyroids from a cadaver might be grafted to cure severe tetany, but nothing in this line in treatment of puerperal tetany has been published.

Etiology and pathogenesis.—Tetany is frequently seen in children, but is relatively rare in adults in North America. The disease is especially prevalent during certain months of the year; the first three months are often spoken of as tetany months. Tetany then occurs in epidemics. It is especially prevalent in certain cities, notably Vienna, Paris, and Heidelberg. Several members of one family may be simultaneously affected. Whether this depends upon hereditary or upon environmental conditions is not certain. Since several generations in the one family have been known to suffer from the disease, it seems probable that in some cases of the disease inheritance is important. Males are more often attacked than females. Men engaged in certain special occupations (shoemakers, tailors, metal workers) seem peculiarly liable to the disease. Crowded quarters and bad hygiene surroundings certainly predispose. The relation of calcium metabolism to parathyroids is noted in the improvement of these cases under calcium administration. The tetany of childhood is most common in the second half of the first year of life. It rarely occurs before the third month or after the third year. Another period of life is late adolescence, seventeenth to twentieth year. In later life it is sometimes associated with maternity; gastrointestinal diseases; infections and intoxications, strumectomy. The so called maternity tetany may occur at any period of pregnancy or lactation, but, like all forms of tetany, it is most common in the so called tetany months. Some women suffer from tetany every time they are pregnant or have a child. The uterine contractions may set up tetanic spasms. It may be necessary in severe cases to induce premature labor. The course of puerperal tetany is generally favorable but there are cases on record with fatal outcome. It seems obvious that in pregnancy and lactation greater demands are made upon the parathyroid functions than at other times. Whether this is related to the hypertrophy of the adrenals, which are believed to be antagonistic to the parathyroid bodies, is not yet certain. The tetany accompanying gastric dilatation long since attracted the interest of clinicians.

Cholelithiasis, pyloric stenosis, carcinoma ventriculi, helminthiasis have been accompanied by tetany; it is also an occasional complication of typhoid fever, influenza, pneumonia, tonsillitis, and other infectious diseases. Children of women with severe maternity tetany may be quite healthy or develop it themselves.

The tetany following strumectomy is of great historical interest as the cause of experimental investigations. Such postoperative tetanies may set in within twenty-four hours after operation or at any time during several weeks thereafter. The spasms are usually severe and sometimes have fatal termination, especially when laryngospasm occurs. Epileptiform convulsions are frequent in this form of tetany. Metabolic studies show a diminished carbohydrate tolerance, an increased calcium excretion of chlorides, eosinopenia and increased ammonia content of the blood. MacCallum suggests that the increased excitability of the nervous system may be related to the loss of calcium. There is some evidence of the chromaffin system and of the thyroid gland. The hormone doctrine of tetany is gaining adherents and evidence points to an action upon the neurons of the medulla oblongata (innervation of respiration and circulation, glycosuria, polyuria, and upon the cervical and lumbar enlargements of the spinal cord).

Symptoms.—Tonic spasm occurs in certain muscles, especially in the upper extremities, resulting in the position of the obstetrical hand. The proximal phalanges are flexed, while the middle and distal phalanges are extended. The thumb is turned into the palm, and firmly held against the other fingers. The wrist is only slightly bent backward or forward, the elbow is held midway between flexion and extension, with the upper arm adducted. Similar spasms occur in the lower extremities with extension, of the hip and knee, and strong plantar flexion of the foot and toes, with supination of the ankle and adduction of the thighs. The convulsions of children are often due to tetany. Spasm of the muscles of the face and trunk are rare, though the facial expression is sometimes characteristic; angles of the mouth drawn down, deep nasolabial folds, forehead wrinkled, wide lid slits. This is known as the tetany face of Uffenheimer. Spasms of the larynx occur in child and adult and death may occur in the attack. The spasm may be painful or associated only with feeling of tightness in the parts and paresthesia. Attacks may be unilateral or bilateral in distribution, attacking all four extremities. The disease may give rise to attacks of asthma during its course.

Patients complain of paresthesias in the extremities, and feeling of tightness. They often remark it feels like water running down arm or leg. Sharp shooting pains are complained of running up and down the spine. They will tell in the beginning how at times the legs refused to move for them, for several minutes. Béchard reported a case where it was confined to the hip muscles of one side and simulated coxalgia.

Vasomotor, trophic and secretory disturbances. Some patients present pallor of the skin, dermatographia, angioneurotic edema or erythemas. The trophic changes in the hair, nails, and teeth may call

the attention of the physician to the existing trouble. The nails may be fragile or transversely ridged. The hair often falls out, in chronic cases is usually thin and short. The enamel of the teeth shows transverse furrows and small holelike defects. The teeth may be marked by several horizontal grooves of enamel defect, which make sets of parallel lines running along the teeth. Incisors and canine teeth are most often affected; the molars more rarely. Dentists in cleaning teeth try to eliminate the furrows, so doing material damage.

A perinuclear cataract, usually bilateral, which ordinarily causes no subjective disturbance of vision is sometimes an early sign of chronic tetany.

Tetany may be caused by a number of factors, but depends upon increased mechanical excitability of the motor nerves. Thus, if the facial nerve be tapped at its exit, in front of the ear, a quick contraction of facial muscles follows. This facial phenomenon may occur in conditions other than tetany. A lesser degree of it has been met with in incipient pulmonary tuberculosis, in neurasthenia in epilepsy, and occasionally in apparently healthy persons. This sign may even be absent. Erb's phenomenon depends on the increased electrical excitability of the motor nerves; an early appearance of a cathodal closure tetany; an early appearance of an anodal closure contraction followed quickly by an anodal opening contraction, and, especially, the appearance of a cathodal opening contraction indicate a heightened electrical excitability. Faradic stimulation of nerves often calls forth a fibrillary wavelike contraction in the muscle, to be followed quickly by tetanic contraction. The reflexes in tetany show no constant alteration.

In both acute and chronic tetany, disturbed mental states are common. In the acute forms, irritability, mental apprehension, and anxiety states are not infrequent. In the chronic forms, the patients may present general neurasthenic symptoms or even signs that make one suspect mental deterioration (injured recording faculty, feeble memory; lack of concentration). Outspoken psychoses are rare, but they may occur. They may take the form of hallucinatory confusion. The rigidity of catatonic states must not be confused with spasms of tetany.

Prognosis.—The postoperative type not infrequently terminate fatally. The majority of cases of all forms of tetany recover, though the possibility of recurrences in the tetany months at different periods of life, must be kept in mind.

Diagnosis of tetany would be less often overlooked if certain predisposing factors (pregnancy, gastrointestinal diseases, strumectomies, specific occupations, time of year, were not lost sight of. The history of the patient's feeling, the lightning like pains shooting up and down the spine, temporary loss of use of an extremity for a few minutes. The transverse ridges on the incisors will often put one on his guard. It may be necessary to differentiate tetany from epilepsy; from hysteria; from catatonia; from tetanus; from cramps in muscles due to other causes.

Treatment.—Calcium is the main reliance in treatment. Milk and vegetables are useful on account of the high calcium content. As little salt should be used as possible, to reduce the amount of

sodium in the organism, thus cleaning the field for calcium salts. Guggisberg warns that morphine, ergot, atropin, calomel, tuberculin, pituitary extract, chloroform, and ether should all be avoided when there is a latent tendency to tetany, as they are liable to bring an attack, a statement repeatedly confirmed in animals. Chloral and bromides work best for pain.

The following cases are of interest occurring in women with loss of consciousness during some of the attacks:

CASE I.—A young woman, single, age thirty-seven years, American; no occupation. Past history unimportant. First menstrual period at nineteen years. Irregular profuse menstruation from five to eight days since 1910, previously scanty. Denies ever being pregnant. Present condition dates back about nineteen years ago, following the fatigue of helping her mother to move; grew very nervous. Three days after moving had what she called "one shock after another," affecting the lower extremities first, clearing up in lower limbs; then the arms would become rigid, her jaw locked also. Mother said she had convulsions and vomiting for eighteen hours. The convulsions from history were more of general rigidity. During this time mother stated that she was delirious and her mind a blank at times. Both patient and mother could give a textbook description of her affliction. The patient loves to sit in a rocker and wholesale her symptoms to visitors: She complains bitterly of the shooting pains up and down the spine since the beginning. Very easily excited and looks for the attacks when heavy thunder storms come. Around menstrual time, until sixteen or seventeen years old, had slight attacks of spasms in extremities lasting variable lengths of time. Always has headaches around her period. During the attacks of tonic spasm the wrists and fingers assume the position of obstetrical hand. Feet are extended, toes adducted. Pressure on ulnar nerve will cause spasm. During 1916 and early 1917 suffered fewer attacks than for years. Never took any exercise, consequently her muscles are atrophied from disuse. Afraid to go out walking, believing a shock may overcome her.

Examination showed transverse grooves on six lower teeth in front. Upper teeth replaced by false ones. Reflexes exaggerated. Pulse 68, tense in character but perfectly regular. Pressure on ulnar nerve would produce typical spasm.

Calcium improved her condition while she continued to take it.

CASE II.—Age thirty-one, married, American; occupation, housework. Past history: Chickenpox and whooping cough as a child. Gastric hemorrhage at sixteen years of age (probably ulcer). Stomach now in good condition. Menstruated at thirteen. At fifteen grew very fat; periods stopped for six months, then had heavy flow during periods for several months following gastric hemorrhage; grew very thin. Irregular periods since sixteen years, at times very profuse; during past year very irregular. Present condition dates back to November, 1914; lactation appeared during third month of pregnancy; a few days following its appearance began to have attacks. First had very nervous and creepy feeling all over, lasting for several minutes. Then her legs began to grow stiff; said "they would not move for her." This state of rigidity lasted about five minutes. During the next months attacks became more frequent, attacking first one extremity, then another. The feeling of water running down an arm or leg preceded the contraction. These attacks gradually grew longer in duration, lasting from a few minutes to several hours in duration. With a severe one the patient would lapse into a delirious state, having delusions and hallucinations of all kinds. The shooting pains would run up and down the spine into head or shoulders. The patient would often cry out, "Oh, he hit me with a sledgehammer!" All the signs and symptoms of textbook descriptions could be found in this case. After she had had a premature delivery at six and one half months of a child, who lived for a few minutes, the attacks gradually grew less. The afterbirth showed evidence of some kind of inflammation.

During 1915-1916 attacks would only come on during a

nervous pressure of some sort. Angioneurotic edema, and shooting pains in spine present at times. Early in 1917 patient again became pregnant, and almost with the beginning of pregnancy attacks commenced again worse than ever, lasting one to five days at a time. This time, all four extremities would be involved at once, with reappearance of mental condition. Curiously enough, when patient could be assisted from prone position to sitting up, the mental state immediately cleared. These attacks would always be worse around menstrual time. Laryngeal spasms and asthmatic attacks would play their part when rest of body was not involved. Pains and paresthesias would always precede the attacks. Pregnancy went on apparently for three months, then stopped; a profuse foul smelling odor with continuous vomiting led to evacuation of uterus. Fetus was dead; placenta badly decomposed.

The patient immediately grew better, and has had very few attacks since. She had pains in the spine and angioneurotic edema particularly when she would take calomel. Occasional attacks of spasm of larynx are still present. Attacks of rigidity have disappeared. Calcium improved her condition.

These two cases show the relation of menstruation to the disease; both lost consciousness. Case II showed the relation of the placenta to the attacks.

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320 WEST AVENUE.

AN ACUTE FEBRILE ENTITY WITH VOMITING, SOMNOLENCE, AND ACETONE.

A Preliminary Note.

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For the past few weeks I have been meeting, with increasing frequency in private and consultation practice, cases occurring in infants and young children, which have exhibited marked uniformity as to symptoms—fever, vomiting, somnolence, and the odor of acetone upon the breath. It is my purpose here to draw attention to this type of morbidity and to lessen the confusion for which it has been responsible.

Onset.—The onset is sudden. In one instance, a physician's child, the symptoms seemed immediately to follow a fall upon the head. There was in reality no connection between the trauma and the subsequent illness.

Symptoms.—Vomiting, present in all instances, occurs quite suddenly. It is forceful if the stomach happens to be full, and occurs as persistent gagging with the expulsion of mucus and bile when the organ is empty. The smallest amount of food, and especially water, provokes emesis. In fact, in some cases it has been noted that small amounts of solids are better tolerated than liquids. Within two to four days vomiting ceases and is succeeded by ravenous appetite. The bowels are constipated at first. As the vomiting lessens, diarrhea sets in and becomes persistent. The tongue is coated: and in many I have observed the most pronounced dental caries. This is, of course, coincidental, although it may have an etiological bearing.

The breath always has the odor of acetone, sometimes so pronounced as to be noticeable when en-

tering the sickroom or, at least, when approaching the bed. Acetonuria was present in those cases in which I had an opportunity to examine the urine. In one or two instances a faint trace of albumin was detected. Fever commonly accompanies the abrupt onset. It reaches 101° to 104° F. and lasts a few days, falling by rapid lysis. In a few cases it did not register above 100° F. per rectum and two cases were afebrile. Dr. H. B. Shmookler in a personal communication records a fatal issue following a temperature of 107° F. There was no time, however, to exclude all other diagnostic possibilities.

Drowsiness and persistent and alarming somnolence, amounting almost to a mild stupor have been consistently present. Associated with the persistent vomiting, it caused much confusion in cases seen in consultation with reference to the possibility of meningitis. While irritability has been commonly noted following the febrile stage, in some cases a peculiar state of indifference to external surroundings has been presented, the child permitting himself to be handled and moved about without protest. The pupils as well as the deep and superficial reflexes are normal and muscular rigidity is everywhere absent.

The pulse rate increases with the rise in temperature. It does not partake of the nature of the slow, full, irregular pulse of meningitis—an important point of differentiation early in the history of the latter disease, particularly of the tubercular variety. In a few cases studied no abnormality in the blood was noted. In this connection, however, further study is necessary. Catarrhal features have been noted but do not constitute an essential part of the clinical entity. Diarrhea has been mentioned. Cough and varying degrees of bronchial irritation were noted. When the cough is severe and associated with high fever and sudden onset this condition may be confused with pneumonia. A résumé of principal symptoms would be: sudden onset, forceful vomiting, fever, drowsiness, acetone on the breath, and acetonuria.

Diagnosis.—I have been unable to classify this entity. Acetone on the breath and acetonuria are common features of many acute febrile movements, both infectious and noninfectious. On the other hand, persistent vomiting and somnolence characterize systemic acidosis. It is proper to inquire, therefore, whether acetone on the breath and the acetonuria are simply symptoms of the acute febrile process as the fever itself, is the cough, or the rapid pulse, or whether they and the fever and the somnolence represent the main and distinctive symptoms of the acute acid intoxication depending itself upon some undetermined etiologic factor—a fixed poison, a disturbance of the metabolism related to climatic or thermometric changes or other as yet undeterminable cause.

Is it a form of influenza? This much abused term bears the brunt of professional ignorance regarding an undiagnosable, acute, febrile condition. Anuraesthesia does toward subacute and chronic diseases. Its bacteriology has not been studied. Proof negating influenza as the causative agent is lacking. On the other hand, acetone on the breath, acetonuria, vomiting, and drowsiness are not con-

stant features of influenza. At the bedside the differentiation from meningitis, pneumonia, appendicitis, typhoid fever, and head injuries must be made. In meningitis, aside from the distinctive features—cracking headache, vomiting, slow, full, irregular pulse as an early symptom, and Babinski's, Brudzinski's, and Kernig's signs—lumbar puncture provides decisive information. Although I am not prepared at this time to state that there are no abnormal changes at all in the spinal fluids in these cases under discussion, in the few in which I have performed a puncture, save one, there were no evident abnormalities. In this one case the serologist reported that he was strongly suspicious of tubercular meningitis, because of the high albumin and globulin content, the large increase in the number of cells beyond normal, and the preponderance of lymphocytes. No velum or tubercle bacilli were demonstrable, nor were there any clinical features suggestive of tubercular meningitis. After a fortnight's observation the child's condition has steadily improved and he now appears perfectly well. The various other types of meningitis are distinguished by a cloudy fluid and the recovery of the special bacteriological agent.

Subpleural or formerly so called central pneumonia may be devoid of physical signs in the beginning. The diagnosis of pneumonia without demonstrable physical signs or without roöntgen demonstration, must be taken *cum grano salis*. Leucocytosis is a constant feature of pneumonia; vomiting and somnolence are not. Typhoid fever, recognizable by its accepted symptoms and tests, offers little difficulty in the differentiation, and appendicitis, if it is borne in mind, is readily distinguishable or eliminated. Head trauma need only be mentioned to be properly investigated.

Prognosis.—All the patients recovered, although convalescence was stormy in some. Somnolence seems to persist in many cases following the subsidence of fever. Doctor Shmookler's patient died apparently from hyperpyrexia. Diarrhea may become annoying.

Treatment.—A course of oral or rectal enemata of calomel should be ordered. One twentieth of a grain of calomel placed dry upon the tongue every fifteen minutes for ten or twenty doses will, with counter-irritation over the epigastrium, materially control vomiting. During the administration of calomel not even a drink of water is permitted. One hour after the last dose of calomel the oil of sweet almond should be administered. Feeding is not inaugurated until the oil has caused free evacuations. Small amounts of solids are then permitted at frequent intervals. Selections should be made from well cooked cereals, soft eggs, and dried bread crumbs. Later, thickened orange juice, may be substituted for the orange juice. Milk is not allowed for some days; it is then diluted half with water, boiled two minutes, and given without sugar. One or two warm baths given daily are of service. An enema containing twenty grains of sodium bicarbonate and soda is also useful. This remedy is given by mouth, plain or mixed with the food, in the dose of sixty to 120 grains in twenty-four hours. Small doses of aspirin and aconite will control the temperature.

DICHLORAMINE-T IN TREATMENT OF
WOUNDS.By JOSEPH C. SCAL, M. D.,
New York.

As my work consists almost entirely in the treatment of accident cases of industrial origin, I have been able to note the remarkable results obtained with the newly arrived dichloramine-T. Where, previously, about twenty to thirty days were required to heal infected wounds, and about ten to fifteen for noninfected wounds with ordinary aseptic and antiseptic methods, we now can obtain the same results in a much shorter time. Where it is possible to apply dichloramine-T properly, immediately after the wound is received, the danger of infection is almost nil; while cases already infected respond to this treatment at once, pus entirely disappearing in from six to eight days.

Perhaps the most important factors in using the antiseptic are its preparation, preservation, and application. In preparing dichloramine-T a ten per cent. solution is made by first dissolving three grams of the powder in from five to ten minims of chloroform, and then adding 30 c. c. of chlorinated oil of eucalyptol. For the first application a ten per cent. solution is used, in subsequent dressings a five per cent. will generally be adequate. This solution must be kept in an amber colored bottle, away from the heat, sunlight, and water. To obtain the best results, fresh solution should be prepared every twenty-four hours, as old or decomposed solution will cause wound irritation.

In application care must be taken that the wound is absolutely free from moisture and thoroughly dried by electric heat, sterile cotton or gauze. (Water coming in contact with the dichloramine-T will disintegrate it, forming hydrochloric acid which will cause considerable irritation.) The solution is applied locally either by an applicator or an amber glass atomizer. The latter must be all glass, as the solution immediately corrodes any metal with which it comes in contact, and it is by far more desirable, as it obviates the necessity of touching the injured part. Four layers of gauze are placed over the antiseptic covering the wound, and the part bandaged. It is necessary to change the dressing every twenty-four hours for the first four or five days, after which once in forty-eight hours will be sufficient. To change the dressing remove the gauze, apply new solution, and rebandage. It is absolutely unnecessary to touch or wipe the wound, as any pus that may be present will be removed by the force of the spray. If the gauze should stick, solution sprayed over it will soften it and facilitate removal.

This method, carefully followed, gives remarkable results: clean aseptic wounds will heal in six to seven days, infected wounds in ten to fourteen, and the wounds of compound fractures in twenty to thirty. Great advantages, these, in infected wounds near joints and in compound fractures where it is desirable to institute passive motion as soon as possible in order that no stiffness or ankylosis shall result. In punctured wounds a free incision should be made, before the solution is applied. In treating lacerated wounds follow the usual procedure

Remove all foreign substances; and devitalized tissue, and apply the solution. In incised wounds, where sutures are unnecessary after bleeding has been arrested, the wound is thoroughly dried and the dichloramine-T applied, and, where sutures are necessary, the dichloramine-T is used first and then the sutures of horsehair are inserted, and the antiseptic again sprayed over the wound.

Compound fractures are treated by applying the antiseptic as deep in the wound as possible, with a pipette or eye dropper. The usual procedure of splinting and radiographing is adhered to, the fracture reduced, and the antiseptic continued until the wound is completely healed. In infected wounds which have come under my care and in which time has elapsed since the wound was received the same remarkable results are obtained.

The following cases, some of which have been under the care of Dr. Walter H. Oliver, may be of interest:

CASE I.—W. N., age twenty-eight, mechanic, injured October 24th, by catching right hand in power press. Injured sustained compound fractures of middle and index fingers of the right hand, and reported at my office for treatment fifteen minutes after the accident. Examination showed both fingers almost completely amputated at the middle phalanges, each one being attached by a flap of skin, one half of an inch long, on its under surface. After arresting hemorrhage, applying retention sutures, and resting the fingers upon splints I applied a 10 per cent. dichloramine-T solution, dressed the fingers and had them radiographed, the report of which confirmed the diagnosis. The dressing was changed daily for the next five days at the end of which time the dressings were changed every second day, and at the end of two weeks the wounds were completely healed.

CASE II.—S. S., age thirty-one, negress, machine operator. Injured November 28, 1917, by catching left middle and index fingers in power press, mangling the terminal phalanges of each. Appeared at my office one-half hour later for treatment. After amputating the crushed and devitalized tissue under novocaine, flaps were made, the dichloramine-T applied and then the flaps were sutured. Daily dressings were applied for one week, the second week the stumps were dressed every other day and on the fifteenth day the sutures were removed and the stumps completely healed within a few days.

CASE III.—T. S., age twenty-six, helper, injured November 24, 1917, by nail of box penetrating the right middle finger. The wound was neglected until November 30, 1917, when he appeared for treatment with a severe infection of this finger. Examination showed a cellulitis of the terminal phalanx of the right middle finger, involving the bone. The finger was incised under gas anesthesia, but the bone was not touched. The wound was flooded with dichloramine-T, and was completely healed on December 15th, when baking and massage were instituted to loosen the terminal joint.

CASE IV.—J. L., age twenty-two, cutter, injured September 11, 1917, when his knife slipped and cut left thumb. Treated at New York Hospital until September 24th, when he appeared at my office. Examination showed a compound, comminuted fracture of the terminal phalanx of the left thumb; radiograph showed evidence of necrosis of one of the fragments and a marked infiltration of the soft tissues. At first the finger was treated with Dakin's solution, but it was found necessary to remove several fragments of the necrosed bone which were separated from the major fragments, preventing union. The operation was performed October 15th, Dakin's solution was still used until December 17th when the treatment was changed to dichloramine-T. An improvement was noted at once, pus completely disappearing in ten days, and on December 29th only serum was present, the wound being completely healed five days later.

213 EAST BROADWAY.

GASTROINTESTINAL DISEASES IN THE AGED.*

By SAMUEL FLOERSHEIM, M. D.,
New York.

The aged are persons over sixty-five years of age, and modern gastroenterology is the study of more than the stomach and bowel, it takes in brain and mind, the aeration, circulatory, secretory, and excretory systems and many of the organs of the special senses, including the teeth. Private and clinical practise have shown me that malignancy is not in the preponderance; the ptoses and the atonies predominating. Because a thickening or growth is suddenly discovered it is not to be interpreted as malignant simply from the fact that the patient has passed the forty-fifth year.

Much care must be exercised in the interpretation of the subjective and objective symptoms, for one easily becomes biased and thereby led astray. We must not lay too much stress upon senilis pure and simple and lightly dismiss the symptoms as incidental to old age, for we can and do have definite organic states. Trivial symptoms in a number may well mean serious ailment. The accompanying neuroses, though more or less prominent, require treatment, though somewhat different than in the young.

Disturbances of the mind, diseases of the brain, heart, lungs, bloodvessels, ears, nasopharynx, and other organs of the thoracic, abdominal and pelvic cavities may excite gastrointestinal symptoms, and if not carefully weighed are likely to be interpreted as of gastrointestinal origin, the treatment of which will fail to benefit.

Nasopharyngeal diseases, especially the purulent varieties, when present, are fruitful sources of gastrointestinal disturbances and therefore should receive prompt and intensive treatment. In the great majority we find approximately all the teeth missing. Many have not acquired artificial ones. This condition makes mastication difficult and is often the cause of gastrointestinal disturbances. It is a direct cause of malnutrition. The treatment consists in the extraction of stumps and isolated teeth where they exist, to be followed in time by artificial teeth on plates. In the esophagus we may have spasms, strictures, chronic ulcerations, dilata-tions, separation of the muscular fibres, and rupture. Malignancy, when present, more frequently occupies the lower portion and is difficult to diagnose. Very infrequently we find a retroesophageal abscess and late syphilitic manifestations.

In the treatment of strictures, the first thought is the bougie. Coupled to this is the feeding of semi-solid and liquid foods. In rupture and fibre separation surgery may do some good. In postesophageal abscess, surgery is the only treatment that is indicated, yet it is a question whether it will do good in the many. In the syphilitic, antiluetic medication is called for. In dilatation little can be accomplished, though intraesophageal faradism may be tried.

In the stomach we have atony, gastroptosis, chronic gastritis, dilatation, new growths, either benign or malignant, ventral and diaphragmatic hernia, volvulus, arteriosclerosis, congestion, and foreign

bodies. Ulceration is exceedingly rare, likewise perforations. Intra-gastric faradism does some good in the atonies and gastroptoses. Massage and an abdominal binder also help. Pepsin, nux vomica, and hydrochloric acid have aided many. Arsenic, iron, malt extracts and champagne have also been used with material benefit. The hernias are suitable for operation in only a few selected cases. The arteriosclerosis is dependent upon the general systemic condition and is somewhat improved by the administration of nitroglycerin and iodides. Foreign bodies require surgery for their removal where permissible. Passive congestion is usually dependent upon the cardiovascular condition and disturbances of the abdominal venous return. The methods that improve the cardiovascular system and relieve the return venous obstruction benefit the gastric congestion. In the small intestines, atony, intussusception, perienteric abscess, foreign bodies, strictures, chronic enteritis, arteriosclerosis and malignancy are observed. For atony and strictures give belladonna, though hyoscyamus may sometimes be used. Electricity may do some good, especially when pain is present. The galvanic current should be used in preference, otherwise the faradic current. Foreign bodies and abscesses most always indicate the use of the knife. In the greater majority of the malignancies, surgery will do no good. Where metastases can be practically excluded and a fair general physical condition being present, excision may be attempted. In chronic enteritis opium is the best drug. Intussusception may require operation. In the large intestines we find atony, chronic colitis, volvulus, intussusception, fistulae, hemorrhoids, diverticulae, strictures, ptoses and malignancies. Ulcerations, especially about the anus and rectum, may be present.

For atony, massage and faradism should be employed together with nux vomica and belladonna. Chronic colitis often requires opium. Volvulus may require surgery. Hemorrhoids and fistulae when not aggravating are better left alone. Malignancies, except in rare cases, derive but little benefit from surgery. Appendicitis is infrequent.

The diseases of the liver usually seen are cirrhosis, cysts, atony, ptosis, malignancy, and late syphilis. Only in the syphilitic can we expect good from treatment. Gall bladder diseases are, usually, chronic cystitis from old gallstone cases and malignancy. Surgery may be of benefit in a few selected cases. Empyema is rare, and for this surgery is the only treatment. Diseases of the pancreas are mostly malignant and hemorrhagic and little can be done.

There are many extragastrointestinal conditions which have been omitted though they have at times considerable influence upon the digestive tract. It should be borne in mind that they exist and treatment instituted to relieve the patient of their gastric disturbance whenever possible.

I have omitted reference to the diet, hygiene and equilibrium in the treatment. In these three phases would take very long. Diet in all cases should be mostly semisolid and fluid, of good nourishing quality, small. Food should be given frequently. Baths, preferably warm, good air, some exercise, and sufficient sunlight are necessary.

*Read before the Yorkville Medical Society at the stated meeting on November, 1917, in a symposium on "Geriatrics."

Medicine and Surgery in the Army and Navy

THE PRESENT AND FUTURE WELFARE OF THE SOLDIER.

Under the Section of Miscellaneous Topics at the recent meeting of the American Medical Association, many of the finest intellects in the United States and England conferred with practical sympathy concerning the men who now guard us with all their strength, and who, when lacking that strength through grievous wounding, hold righteous claim to our uplifting. Below we give abstracts of the more important addresses delivered in the meetings of this section.

RECONSTRUCTION OF THE WOUNDED.

Surgeon General Gorgas was the first to speak, Dr. Frank Billings, chairman, introducing him. The speaker said that what he had just heard in his praise from the chairman was in a line with what he had been hearing all the time in Chicago. Naturally this somewhat distorted his estimate of himself. He was beginning to think he was a pretty big fellow. This question of reconstruction was a new one to the U. S. Army, and also new to military life, being a product of the present war. Originally the whole aim of an army was to defeat the enemy and things that had no bearing on that question were let alone. Three hundred years ago the wounded were considered a drag upon the army and no attention was given them, but, gradually, the idea of caring for the wounded had been evolved, there was no doubt that if it were necessary for the defeat of the enemy, the country would be willing to do what its ancestors were willing to do, that is to sacrifice the wounded as done in savage armies. The Zulus, for instance, were efficient military commanders. Their armies operated far from home, and they were obliged to kill off the wounded who were not able to march, but this was done rather than abandon them where they would starve and have prolonged suffering. Three hundred years ago one of the great French war surgeons came across a hut in which there were four wounded French soldiers. He went in with the orderly and looked at them. When he came out, after a short conversation, he went back and most skillfully and effectively cut their throats. There was a certain humanitarian principle involved in this action. Nowadays, the great function of surgery was to put the men back in the army, but those who were unfit for further service would be discharged and brought back to this country. The statistics of the Canadian army gave a very good idea of what would have to be done. In four years they had sent over 350,000 men and, of these, ten per cent. had been returned for reconstruction work. The United States would probably have the same.

Dr. Frank Billings, taking up the same subject, said the national program would not be complete if it did not include care of the soldier from the moment he received his disability to the time he was restored to civil and economic usefulness. Con-

gress had recently passed a law which placed the disabled soldier under the jurisdiction of the Federal Board of Functional Reeducation, a board composed of qualified men with power to secure from all parts of the country the best educators and teachers, with no restrictions as to salary to be paid for their work. The Surgeon General had the harder task of the care of the soldier when actually ill overseas in camps, in hospitals, and in this country until discharged. Immediate measures for reeducation were already employed and this meant that the man who had lost a limb, his sight, his hearing or his speech should not remain unattended until discouraged, but should, at the earliest moment, commence his reeducational training. Therefore the general hospitals were departmental and carried on reconstructive work. Many hotels and institutions had been taken over, and these were located in regions where the soldier was nearest his home. The ideal condition would be that these should be State institutions, but it was too early yet to speak of that. At present the general hospitals were situated in the sixteen military districts. They included not only operating rooms, wards and laboratories, but the necessary gymnasiums, and hydrotherapeutic and electrothermic arrangements, with a department for curative employment. The ward work was at first diversional in character, but later became prevocational or even vocational. Here the Federal Board acted in an advisory capacity with the War Department in supervising the activities of the soldier. In regard to medical supervision, the numbers of physicians had grown from 700 to 20,000 in one year, the best qualified men in the country being engaged in this work. The British Government had arranged to transfer the services of Doctor McKenzie to this government to standardize physiotherapy. James E. Russell, dean of the Teachers' College of New York, was appointed to gather all the technical and physical educators to advise with medical men and psychologists, and with the soldier himself. In seven hospitals this plan of organization was already complete. Men were already being established in new and gainful occupations and the public must also be educated to give all necessary help and cooperation to the Surgeon General.

Colonel Casey A. Wood, of Chicago, then told of reconstruction and rehabilitation problems as demonstrated by experience in foreign countries, saying that the United States must look to Canada chiefly for help in its reconstruction problems, for Canada, holding the same democratic ideals, had been the first to recognize that duty. It was early recognized that a soldier having lost a limb and having passed through one or two hospitals was in a state of mind fatal to rehabilitation. Thus the "Cheer-up" program was instituted and social workers were instructed to visit the wounded and kindly but firmly preach the doctrine of civil reconstruction. Movies were employed to teach the disabled men what could be accomplished. This doctrine required continuous, uninterrupted supervision of the man until

he was reinstated in civil life. Furloughs were therefore not encouraged. The great enemy of this program was idleness brought about by inertia, and the soldier must be kept busy by a judicious mixture of work and play. Propaganda and publicity played an important part in reeducation. There were three classes who must be reached: medical officers and teachers; the soldiers themselves; and the public. When the man's family possessed a fair knowledge of the principles of rehabilitation, the work of the government was much easier. The little magazine *Carry On* was now being distributed from the Surgeon General's Office, and gave the experience of other nations.

Colonel R. E. Noble commented on the Surgeon General's plans for the receiving, transporting and distributing the disabled from overseas. He reminded them that the wounded were graded according to their sickness or disability from the time they left the fighting line in France. If not fitted to be returned to the firing line within six months, they were to be brought back to the United States at the earliest possible moment. A specially selected officer was detailed to receive them at the port and choose the receiving hospital. This man had transportation training and would arrange the type of coach on which the men would travel, and hospital trains would have every convenience for the comfort of the sick. There were dining cars, kitchen cars, sleeping cars, cars for the staff, and unit cars for sets of medical officers and nurses, which could be detached from the entire train and forwarded to any part of the country, so that half a dozen sick could be detached for any destination, instead of entire train loads.

Reconstruction, said Colonel G. Seelig, of the Surgeon General's office, as he spoke of it in relation to acute surgery, connoted so much that it was apt to interfere with its own utility, for it embraced physical, psychical and functional properties. Acute surgery not only embraced war traumata, but applied equally to acute surgical diseases occurring in camp. It included acute appendicitis at Camp Grant, or fracture of the femur from a mule kick at Camp San Antonio. In spite of new surgical principles developing out of actual warfare, acute surgery began at home, but under conditions differing from those of civil surgery. Most men had spent nights in a Gethsemane over the failure of well meant surgical efforts, and had applied to themselves the balm of Gilead in that they had done their best in the face of adverse fate. That consolation must now be given in. The Surgeon General had now to decide whether the best was done, and, if not, why not? The patient remained the liability of the surgeon for all time. He could not be shifted to another unfortunate colleague. The army surgeon had to return a man in such shape to civil life that he had no valid claim as a pensioner. The soldier had now to submit to operation in order to fit him for soldiering and, when he had done his bit and returned, the government was ready to stand back of him with reconstructive operative work. Much surgery would be performed on home territory. In the advanced zone the problem was seriously difficult and gravely depressing. The rush of battle, the exigencies of

transport, the improvisations of warfare, all exercised their influence on the judgment of the surgeon. Yet even there work had to be done with the idea of restoring the soldier to good health. Even the press of battle did not mitigate by one jot or tittle the baneful effects of unnecessary operation. Neuroses, psychoses, esthesias, bore a direct relation to the front line surgery for cranial injury. Spinal disturbances, bladder injuries, paralyses were all results of wrong surgical judgment. Wounds of the lung might result in collapse and fistula; improper ligatures might produce ischemia with subsequent necessity for amputation; faulty judgment in joint injury would entail extensive reconstruction thereafter. If reconstruction, however, exacted this toll from acute surgery, it also owed surgery definite duties. One could not say where surgery ended and deconstruction began, for if orthopedic, neurological and pathological work were not reconstructive, they were nothing.

GREAT BRITAIN'S EXPERIENCE.

Sir Arbuthnot Lane told a little of what he had seen, saying that at the beginning of war they were fortunate in having men like Keogh to advise the government, for the problem was then incomparably more difficult, and much effort was spent and much criticism made. It was said that the government was employing men unnecessarily, which brought to his mind the story of two trappers. They were pursued by a buffalo and one climbed up a sapling, the other ran on further and got in a hole. The buffalo charged at the sapling, but just then was diverted by the man coming out of the hole. He ran there, and the man disappearing, he ran back to the tree. This happened two or three times and finally the buffalo went off. The man in the sapling climbed down and began to upbraid the man in the hole for not staying quiet. The second man said, "That's all right to criticise, but you didn't know there was a bear at the bottom of that hole." The English Government had had to keep many things secret. There was an army on their flanks in India, there were many other points of possible attack. In Mesopotamia there was a great call for younger surgeons, for older men could not have stood the heat. Aldershot served as a kind of filter where men were rushed through to the ends of the earth. Hospitals were then broken up into medical and surgical sections so that specialists could attend and give the best possible service to the personnel. One centre was devoted to treatment of men whose faces had been hideously shattered or burned. The man who lost arm or leg was sure of sympathy and affection when he returned to civil life; the man who returned with a hideously disfigured face was regarded with horror. His children feared to look at him. His wife had hard work to hide her feelings. It was impossible to keep these distressing cases in a general hospital, and many surgeons were now devoting their entire time to the amelioration of these defects. At the Red Cross Hospital in Kent these people were kept in huts, secluded from the public gaze, until their recovery was being effected. The most prominent dental surgeons first did plastic work, and afterwards from all over the world were giving their services. No hospital did better and

more needed work than this one. Twelve American surgeons were working there who had been received with enthusiasm and had sent a personal message to say how glad they were to help and have the advantage of this experience and this experience would be of enormous advantage to the U. S. Army when need arose. Marvellous bone graft work was being done, new noses and new jaws being formed. The wonderful interest being taken by the women of England was very inspiring; a cheerful smiling presence meant so much to the wounded, which showed that one principle should be kept in mind, and that was to have efficiency and economy in the personnel.

Lieutenant Colonel David Silver spoke of Colonel Selig's remarks about the relation of surgery to reconstruction and told that Colonel Sir Robert Jones, the father of orthopædic surgery, had said, "The pathetic side of reconstruction was in the physical disabilities that ought never to have happened." This was no criticism. Men were working under tremendous difficulties impossible to entirely remove. The orthopædic surgeon had his special sphere of usefulness in preventing the number of cases that would require reconstruction. A great deal of later work would be the removal of adhesions around the joints, a sequence of infection. In proportion as the surgeon could employ primary suture of wounds, these cases would be diminished. Malunion and nonunion of fractures often resulted from frequent inspections and changes of treatment, therefore a plan of treatment which should be universal should be decided upon. This was begun, for a committee of orthopædic surgeons to organize standardization of splints was at work. Before repair of nerve injury could be attempted, the parts should have full range of motion and mechanical control, every man should be trained in the fundamental principles of the mechanical brace. It was essential also that the surgeon should know the levels of amputation from the standpoint of fitting the artificial limb, while care of the stump and early application of the appliance were necessary.

IMPORTANCE OF PSYCHONEUROSES.

One very important subject was spoken of by Major Hutchins, of Washington, D. C., who pointed to the mental and nervous diseases which had assumed enormous importance in the belligerent countries. The Russo-Jap and the Hispano-American wars gave warning that this question would have to be reckoned with, but no one had imagined to what extent. Patients already crowded the base hospitals and it was thought a new disease had arisen, but when they came home and were studied it was found that "shell shock" was no new lesion. The psychoneuroses of war differed only from those of civil life in that they were colored by the experiences of battle. Often these symptoms developed in labor battalions who had seen no active service and treatment differed in no way from that given in civil life. The life of the soldier put the greatest strain upon the nervous system. Montony, constant element of danger, signs of battle, all added to the strain. The surgeon had taken every care to exclude incipient neurasthenics. Well qualified examiners were at every recruiting station, to de-

tect these patients, and more than one per cent. of the soldiers showed incipient nervous and mental defects. These men should do their part at home in industrial life and thus spare hospital beds for the wounded. For those cases of mental instability who did get through the supervision a special hospital was provided. Every disabled soldier needed a certain amount of mental reconstruction to counteract hospitalization, which was very harmful in its psychic effect. Idleness was combated by training in occupation and the mental and nervous cases were kept apart from other patients in the hospitals. In regard to the front line, many cases of shell shock were mild in manifestation, the patients were treated and recovered promptly and were sent back to duty. Cases who relapsed or who showed chronic predisposition, would be sent back to the United States, thus relieving the army of a burden. The best results had been obtained by impressing upon the patient that his case was hopeful and curable and the importance of recreation was not to be overlooked. When work and play became mechanical or passive, they were of distinctly less value. The best combination was remunerative work and sports which required activity of the mind and body.

Sir James McKenzie said that if he might give one maxim to doctors engaged in this work he would say, "Keep your head and use common sense." The wonderful diseases one reads about were nothing more than those met and treated in general practice, or that one personally had experienced when overworked and needing a holiday. The soldier was tired and a bit rattled, and his ailment was called neurocirculatory asthenia, yet a simple interest in life and out door sports would aid in cure. Medical men saw these neurasthenics a great deal. Shell shock was nothing but a neurosis. In regard to the admirable hospital plan shown, it was more than the speaker had ever dreamed of, but it would seem, however, that games had not enough place in the therapeutic scheme. Knocking a small ball about was very good for shell shock, and, although not wishing to encourage immorality, the speaker said that a little bit of a bet was sometimes a wonderful stimulus. He had one patient, a Sunday school teacher, and a wretched golf player. Finally he offered to give the patient a ball if he won, and if he lost he was to lose a ball. From that time on there was never a keener sportsman. The doctor lost a good patient, but gained a good companion. Another man invalidated home with a broken down heart was seen sitting in a tent, waited on by mother and sisters, and looking fat and white and unhealthy. A good wholesome interest in sport made a new man of him, it took these people out of themselves. This problem was now thrust upon the medical profession and they had to ask themselves were they competent to tackle it? It was difficult to get out of a rut, but it must be done if progress were to be made. The question of the assessment of the value of sympathies was a very hard one, yet had to be met. Murmurs would form a large proportion of the medical lesions that would have to be assessed in the disabilities of soldiers. One hundred years had passed since the invention of the stethoscope, yet one could not now say what a murmur really was, nor assess its value, and life insurance com-

panies did not know whether to reject or ignore it. The speaker said the great bulk of his work was to assess the value of symptoms. A man had a murmur and wanted to know what his future was. A great part of the speaker's life had been devoted to the watching of these patients—boys growing up and performing laborious occupations; girls growing up and bearing children. Twenty years of experience had taught nothing but a common sense rule of considering the efficiency of the heart and its response to effort. Out of 100,000 soldiers invalided, ten per cent. had cardio vascular lesions. One typical case was a young farmer who was rejected for the draft. The speaker asked him how long he had been ill. He said, six months. What started the illness? He was rejected for the army and had never been well since. Cases of this type should be followed by the younger men for fifteen or twenty years and at the end of a long life they would be able to form some faint idea of what prognosis meant.

REEDUCATION OF THE DEAF AND BLIND.

There was another kind of work to be done—the reeducation of the deaf and speech defective, and Major C. W. Richardson, of Washington, D. C., presenting this topic, said both military and civil training was to be given by instructors with trained assistants. The Otolaryngological Division of the Surgical Division was situated at Hospital No. 11, Cape May, N. J., and the matron of one of the largest institutions for the training of the deaf was to be in charge of the work with a number of women teachers. At least sixty trained in lip reading had been selected. The average number of teachers required would be 1,000 per million cases of defects of hearing, and 500 per million cases for defects of speech. Later it might be necessary to delegate teachers to go to other hospitals to give instruction to patients with other injuries. War injuries were somewhat different to those of civil life, the deafness being caused by labyrinthine changes due to shock concussion and detonation of explosives. Progressive improvement might occur and after a time, recovery. These cases were not psychoneurotic. Twenty-eight per cent. were due to trauma to the auditory apparatus. Defects in speech were commonly mutism caused by shock concussion. Some aphonias were due to nerve and muscle lesions, while affections of voice were due to gunshot wounds, with large damage to tissue. These cases were pitiful, but were apt to be looked upon with horror by the layman. The deaf also had to suffer a certain amount of social ostracism, as the psychology of the deaf and of the normal man were different and communication was difficult between them. The blind on the other hand received a helping hand from all the world and evinced a serene mental state. Speech defects met with unfortunate derision and facial defects encountered abhorrence. Two young men known to the writer had committed suicide before surgical intervention had been accomplished, one because he feared the surgery, the other because he feared it would not be successful. These cases should be so aided that they could be treated as normal individuals and lifted out of the handicapped class.

Concerning the reeducation of the war blinded, Colonel James Bordley, of Baltimore, Md., said the previous speaker had misrepresented the serenity of the blind. They were *resigned*, not content, and were the Ishmaelites of this century. Unable to maintain their homes, for centuries they had asked for a chance and had received charity. This was one of the mistakes of the economic system, and now that all of the brain and brawn of the nation was demanded, this fund of energy, possessed by the blind, must be utilized. England, France and Italy had recognized the economic value of the blind, and had obtained wonderful results which could be duplicated in this country. Shops were established, professional and agricultural courses were opened and the blind man placed in a position where his full economic value would be most evident. The hospital for the blind at Baltimore, was divided into two parts, one for the officers, one for enlisted men. This division was made in order to remove the restraint that was always felt. An arrangement was made so that some member of the blind man's family could be kept at Baltimore, free of expense, at the Red Cross House, to be educated with the man himself in the reconstruction program. Three serious handicaps had to be and would be overcome, the timidity of the patient, misplaced public sympathy and the reluctance of industry to employ the blind. This school and hospital aimed to equip the blind man so that he would be at no disadvantages in industrial employment. As an example of the fitness of the blind for special tasks, it was stated that the two chief masseurs in one of the large English military hospitals were blinded British soldiers.

MEDICAL NEWS FROM WASHINGTON.

The Pharmacists' Association of the United States has adopted a resolution recommending that the Government should establish a school for the training of pharmacists.

Washington, D. C., June 29.

When Secretary Daniels and Surgeon General William C. Braisted, of the navy, were before the House Naval Committee recently, to explain Senate amendments to the naval appropriation bill, they were asked about an amendment that provides that "hereafter no person shall be appointed an assistant surgeon in the navy who is not a graduate of a standard medical college." The amendment, if enacted, would prevent the appointment hereafter of pharmacists and chief pharmacists temporarily as assistant surgeons, such appointments having been made since our entry into the war to afford promotion to these classes similar to that given warrant officers of other classes in the navy.

It was stated that, while under the present law the Navy Department could appoint as assistant surgeon anybody who could pass the prescribed examination, it always has been maintained that the examination for the medical corps was superior to any other examination given, and that a man that could pass it was qualified to perform the duties. The Surgeon General explained that he was not insistent upon the proviso remaining in the bill, although he thought all men commissioned as assistant surgeon should be graduates of medical colleges.

Some members of the committee suggested that the bill be changed further so as to provide for the promotion of pharmacists without making them assistant surgeons. However, Secretary Daniels requested that the entire subject be omitted from the bill and that a plan be worked out for the future that would not debar the pharmacists from deserved promotion.

* * * * *

Recently Surgeon General Braisted and Medical Director E. R. Stitt paid an official visit to the large naval training station at Great Lakes near Chicago. They made an inspection of the hospital and other facilities for the care of the sick, and they spent considerable time going over the buildings and grounds of the station. They found health conditions to be excellent, and that the medical department organization of the station is most efficient. The station now accommodates about 36,000 recruits, and the visitors were impressed with the high standing of the young men under training, most of whom were drawn from the Middle West. Medical Director Stitt paid particular attention to the sanitary conditions of the station, which were found satisfactory in every way.

* * * * *

Construction of additions and improvements to the hospital establishment of the army in this country during the past six months has been pushed forward by the construction division of the army at a cost of about \$25,173,000. The new buildings consist of hospitals, convalescent barracks, infirmaries, and nurses' quarters.

* * * * *

The War Department has organized a board, consisting of Colonels Deane C. Howard, Frederick F. Russell, Victor C. Vaughan, and Lieutenant Colonel William C. Welch, of the Medical Corps, and Contract Surgeon Rufus Cole, for the purpose of investigating the nature, causes, prevention, and treatment of pneumonia in the military camps. Its ultimate object is to prevent the repetition of the high death rate from the disease that prevailed last fall and winter in these camps.

The Medical Department foresaw the danger of rushing troops to the cantonments and camps, but it was not possible to prevent the outbreak of communicable disease, especially measles, bringing in its train pneumonia and meningitis. This summer and fall the Medical Department must provide for at least as many as it did last year, and it is getting ready.

Despite the haste in the preparations for the medical care of such a number of men, no army prior to the last three years had so low a death rate as that that prevailed at our camps and cantonments. This, however, is due mainly to the fact that never before has any body of troops been made so immune to the ravages of typhoid fever. The most prevalent communicable disease was measles. Although fatal in a comparatively few cases, its tendency was to weaken the patient and leave him open to attack from more fatal diseases, usually meningitis or pneumonia, nearly two thirds of all the deaths in the army from disease having been from the latter.

Studies so far made of camp conditions reveal

some unexpected facts. The death rate varied from 2.3 in Camp Logan and something under three in five other camps to 31.5 at Camp Pike, Ark., with two other camps each with a death rate above twenty-five. The new board is trying to find out why this should be. The good camps are intermingled geographically with the bad. A further examination shows that the camps with high death rates were chiefly occupied by organizations from the South, and why this should be is another thing the board will try to ascertain with a view to its prevention. It also was found that measles is less common among men from crowded districts, due probably to the fact that in the cities nearly every child catches the measles from a neighbor or schoolmate and thus becomes immune early in life.

* * * * *

Major General William C. Gorgas, Surgeon General of the Army, reaches the retiring age of sixty-four years next October, and already there is considerable conjecture concerning his successor in that important office. In connection with pending legislation affecting rank and assignment to duty of medical officers, including those of the Medical Reserve Corps and of the Medical Corps of the national army, there are some interesting developments among prominent members of the medical profession who are serving in the military establishment in a status other than as members of the Medical Corps of the regular army in favor of selection of one of them as the head of the Medical Department.

Of course, as is to be expected, members of the Medical Corps of the regular army are opposed to appointment of any one other than a regular army officer to the position of Surgeon General. For this reason, they do not look with favor upon enactment of any provision of law that would permit that to be done.

* * * * *

Some question has been raised as to the authority of the Public Health Service to make contracts with hospitals in the downtown district of New York City and Brooklyn, in connection with that portion of the regulations of the service which provides that at places where Congress has not provided a marine hospital, contracts may be made for the care and treatment of patients with local hospitals.

The matter was referred to the Comptroller of the Treasury, who says: "Congress has made provisions for a marine hospital for New York, but it is located at Stapleton on Staten Island, about seven miles distant from New York City proper. While Stapleton is a suburb of Greater New York, yet on account of the distance from the city proper it would be practically impossible in some emergency cases for those who are entitled thereto to obtain the medical attention their condition requires." Accordingly, the comptroller holds that contracts for treatment of emergency cases that cannot be transferred to Stapleton can be made with the downtown Manhattan and Brooklyn hospitals.

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Surgeon Julius O. Cobb has been nominated for promotion to senior surgeon; and Drs. Emil H. Marek, Joseph W. Mountin, Ralph E. Parker, and Fayette B. Ross, for appointment as assistant surgeons, in the Public Health Service.

Editorial Notes and Comments

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TITLES AND HONORS IN CANADA

The public press of Canada gives us to understand that the granting of titles and honors promiscuously both to the military and civil individual who may have distinguished himself, is far from meeting with the approval of the people of the Dominion. Indeed, so strong has been the anorexia in the matter that their representatives in Parliament were compelled to take a pronounced stand against it, thereby extracting from the Government the announcement that it had already made protestations to the Imperial authorities, and that henceforth no Imperial honors should be conferred upon citizens of Canada which did not bear the sanction of the Prime Minister of the country. Apparently, judging from the attitude of the public press, titles and honors should, in the main, be reserved for the man on active duty, while Mr. should remain Mister—and no hereditary titles were wanted in Canada at all. There would seem to be the feeling among our friends to the north that pull and influence had considerable to do with landing the heretofore coveted honors, and that true merit did

not count for much; they are, in fact, a sort of emphysema—froth and tissue paper.

So far as the medical profession in that country is concerned, there can be no particular exception taken to the distribution of the honors and titles with the exception of one or two knighthoods—and those not to men who had attained to pronounced distinction in the profession before the war by reason of outstanding professional attainments. Still, having some knowledge of "Who's Who"—"over there,"—the medical profession at home cannot but entertain the idea—call it hallucination or delusion if you wish—that there are several outstanding men, now of long service, and who had attained to eminence on this side of the Atlantic by reason of work, study, pedagogy, capacity, and ability, who for some reason or other have been passed by, their sacrifices forgotten and their merit overlooked.

The signs of the times point to the recognition of merit and promotion in all branches of public service, not alone in Canada, but in the United States and elsewhere. The wire puller has seen his best days. Democracies are no longer going to stand for that Prussian religion which crowds the other man out of bed and, boylike, takes all the blankets for himself. American soldiers of every stripe are fighting for fair play. Throughout all democracies and all communities that ideal has come to stay, and it will become the standard of the future to go by in all walks of life. In the past, wire pulling, grabbing, nepotism, pull, and influence have been in evidence in the medical profession, particularly in hospital appointments and in university life and in medical society life. Gradually all these things are becoming anathema and are smelling to heaven. It only remains to kick the exploiters into outer darkness, professionally, where they may wail and gnash their teeth and in time regenerate.

ADVANCE IN THE ETIOLOGY OF PROGRESSIVE MUSCULAR DYSTROPHY.

Perhaps nowhere in medicine has simplification through the establishment of some inherent unity so established itself as in the history of progressive muscular dystrophy. The history is a long one and full of diversities; it has a wide and varying symptomatology as well as an apparently contradictory pathology which throws opinion on the subject. But in the last few years continual progress is being made toward harmonious views, and particularly is this aided by the more

definite etiology which recent clinical experiences and laboratory findings now support.

The disease was first observed¹ in 1709, but it was not until 1850 that Aran and Duchenne presented the first good description. After this there was a division as to whether the disease was due primarily to a myopathy or to lesion in the spinal cord. There were cases clearly demonstrating the latter lesion, others which equally clearly did not. This led finally to Erb's establishment of a general group under the classification dystrophia muscularis progressive (infantum or juvenum et adultorum), under which could be included the spinal atrophic form, the muscular dystrophic, and the transitional forms which were found between these. Clinical experience has continued to prove that in the same family there may be examples of almost any of these types.

Neither a lesion in the muscle structure itself nor in the nervous tissue has therefore proved sufficient explanation for the appearance and extensive manifestation of the disease. Gradually attention has been more and more centered upon some ulterior factor which caused involvement not only of muscle tissue, but also in many cases changes in the bony tissue with besides many symptoms which are now clearly recognized as evidence of disturbances of the endocrine glands. Eye muscle difficulties, thyroid anomalies, abnormal development of the genitalia, trophic disturbances in skin, hair, nails, abnormal distribution of fat, all these things pointed to disturbance of the glands of internal secretion.

There have been recently three groups of American investigators who have been able to simplify and endorse the more tentative hypothesis of the earlier thinkers and workers, and confirm their findings.² Janney, Goodhart, and Isaacson, working at the Montefiore Home and Hospital in New York, upon certain cases appearing there, believe that the marked decrease in the preformed creatinin in the urine, with its low values in the blood, the abnormal presence of creatinin in the urine while there is a normal amount in the blood, together with hypoglycemia and delayed glucose utilization are all indicative of deficient function probably of various endocrine organs either separately or coincidentally affected. McCrudden, working at Boston, lays emphasis upon the hypoglycemia as responsible for the myasthenia of progressive muscular dystrophy, which in turn is due, with the fatty infiltration, to impaired glycogenesis caused by suprarenal or other endocrine disease.

The third group of workers, at the Neurological Institute, New York, is represented chiefly by Timme. He has been able to examine an interesting familial group of patients, and from the clinical point of view has narrowed the conclusions still more definitely to the marked influence of the pineal gland. Known disturbances of this gland have produced muscular, bony, and vasomotor disturbances very similar to those found in the muscular dystrophies with also abnormal deposit of fat. While both clinical experience and post mortem findings give every evidence of metabolic disturbance, this must be defined and understood in terms of disturbance of internal glandular activity and of the vegetative nervous system. Furthermore, in these clinical cases examined, the röntgenogram shows in each case, shadows in the pineal gland, evidence of deposit there. The ocular muscle disturbances which have been noted by so many writers may also be explained, Timme suggests, by the relation of the pineal gland to the anterior corpora quadrigemina. Furthermore, he suggests that some of the spontaneous cures which have been reported may be explained by the compensatory function of other glands which takes place when the pineal gland ceases its function before or after puberty, when normally it should cease its function. This goes to prove further the interdependence of the endocrine glands and to explain the evident involvement of other glands in progressive muscular dystrophy.

AN OFFICIAL REASSURANCE AS TO TUBERCULOUS AND VENEREAL DISEASES.

The Chicago Tribune for July 24, 1917, published a statement that the number of cases of war tuberculosis in France was 400,000. In an address delivered before the Southern Sociological Congress, and printed in *The Military Surgeon* for June, 1918, Colonel Charles U. Derle, of the Medical Corps of the French Army, corrects this error and, quoting from the official records, states that from August 2, 1914, to October 31, 1917, more than three years in all, only 89,430 men have been discharged for tuberculosis, a proportion not excessive in an army numbering millions of men.

It is true that the privations and excessive fatigue to which the soldier is submitted tend to awaken latent foci or even to develop new foci under the influence of violent physical exertion which stimulates the circulation of blood and of lymph and thus facilitates the dissemination of germs. On the other hand, life in the open air and muscular

¹Progressive Muscular Dystrophy as an Endocrine Disease, Walter Timme, *Archives of Internal Medicine*, January, 1917.

²The Origin of Progressive Muscular Dystrophy, editorial, the *Journal A. M. A.*, March 11, 1918.

exercise aid in building up resistance to infection. Evidently there has been no need for the alarm felt by American mothers lest their sons should develop tuberculosis in the field. Moreover, the French Government has taken precautions to provide treatment for those who do become infected, for Colonel Dercele tells us that the French Army has 8,881 beds provided for tuberculous patients, and that of these 2,399 for medical tuberculosis and 500 for surgical tuberculosis are at present unoccupied.

There has been a relatively high rate of tuberculosis among captives who have returned from Germany, for out of 10,960 prisoners returned 920 were tuberculous, or 9.2 per cent., to which must be added those who have been interned in Switzerland for tuberculosis. Swiss physicians estimate that of the French prisoners returned from Germany thirty per cent. will come back infected with this disease.

Colonel Dercele also has a word of cheer regarding the rate of infection with venereal diseases in the French Army. He says the official figures show the alarming statements published to have had no foundation. Before the war, the army of France had twenty-one cases per thousand and the army of Africa sixty-nine per thousand of venereal diseases. Since the war began, the proportion of infections has declined to fourteen per thousand in the French army and twenty-six per thousand in the African troops. It should be remembered that he speaks with authority as the representative of the French medical department at the Office of the Surgeon General in Washington, acting as the liaison officer between the French and American medical departments. It will be reassuring to the American public to know that the incidence of venereal disease and of tuberculosis has been less during the war than in times of peace.

DYSHIDROSIS.

Dyshidrosis is met with more commonly after the age of seven or eight years, and adults are unquestionably more exposed to it than children. The lesions arise after severe perspiration and hyperhidrotic subjects may be afflicted if they indulge in immoderate exercise. With these exceptions, dyshidrosis is distinctly an estival affection, occurring in subjects exposed to the sun's rays or who suffer excessive perspiration. Besides, certain general causes have a marked influence in its production and anemic and neuropathic subjects are very prone to develop the affection.

Our knowledge as to the pathology and patho-

genesis of dyshidrosis is still rather obscure. The lesions, which are introdermic, first appear as small, rounded cavities, filled with a clear, limpid liquid¹ and surrounded by changed epidermic cells. Later on in the process various products of cell degeneration and some leucocytes appear in the liquid. The initial site of dyshidrotic vesicles is a much mooted subject, some writers placing it quite superficially in the stratum granulosum just below the heavy layer; others locate it immediately below the stratum granulosum or at the level of the spinous cells. From this it would appear that the site of the lesions varies. Usually the vesicles begin in the interpapillary spaces and, because of this, the vesicles have been supposed to be in relation to the sudoriparous glands. But other dermatologists have thought that the excretory ducts are violently distended by a sudoral hypersecretion, resulting in the formation of true little cysts.

This explanation fits in very well with the clinical data we possess, but is not confirmed by histological studies. Williams and Breda have, in fact, shown that the excretory ducts are usually quite independent from the vesicles, and the latter writer has even seen a sudoriparous duct traverse a vesicle without in any way being related to it. Therefore, at present it is quite impossible to have a clear notion of the pathogenesis of this cutaneous affection. Clinically, dyshidrosis is intimately related with quantitative changes of the sudoral secretion, while anatomically there is none. Forez regards dyshidrosis as a toxineurodermitis or a toxic vasomotor dermatosis, while the late Sir Jonathan Hutchinson looked upon it as the result of trophic disturbances. Unna supposed it to be a cutaneous injection. Therefore, nothing but hypotheses have been put forward.

The diagnosis of dyshidrosis is not always an easy matter. It has been mistaken for eczema, and, in reality, it is occasionally the starting point of chronic eczema. Hydrocystoma differs from dyshidrosis by its appearance exclusively on the face and its intradermic localization. Sudamina are more generalized, are smaller in size, and their evolution shorter.

The vesicles of certain forms of cutaneous triphthyrism are sometimes in small, definite limited groups, disseminated without order and not in patches of elevation. The last is a common feature. Finally, certain artificial medicamentous dermatitides may cause the diagnosis to remain in suspense, but their seat will correspond with the dressings which gave rise to the affection, and besides, the eruption is polymorphous, which is not the case in dyshidrosis.

CELEBRATING THE FOURTH.

Fortunately the noisy celebration of the Fourth of July, which included the burning of much powder, the firing of many toy pistols, and the development of many cases of tetanus, is gradually falling into abeyance, and we are learning to express our patriotism without the aid of powder, except in France. Nevertheless, the innate love of the small boy for noise persists and we have a certain amount of fulminant patriotism still to deal with. This means the infliction of wounds carrying with them great danger of the development of tetanus. Therefore, the physician should see to it that there is a supply of antitetanic serum available at the nearest drug store for use in such cases. It is a good routine procedure in America, as well as in France, to give a prophylactic injection of antitetanic serum whenever a deep pistol or gunshot wound comes under the notice of the practitioner.

Obituary

EUGENE WILSON CALDWELL, M. D.,
of New York.

The pathway to the utilization of discovery is divergent and thorny, but some must venture or all would be regressed. Railroads, navigation, contention with plagues, aeroplanes, seem each to have demanded a bloody toll, and röntgenotherapy has already claimed many lives. One death to be much regretted is that of Major Eugene Wilson Caldwell, a Savannah man, born in 1870, graduating at the University of Kansas in 1892, and spending the rest of his life in New York, always interested in electrical work and doing government work in the United States Lighthouse establishment and in the engineering department of the New York Telephone Company before he ultimately turned all his thought to x ray work, his inventive genius enriching its therapy with the Caldwell liquid interrupter and other devices. He was a real inspiration to his coworkers at the New York Orthopaedic Hospital and the Neurological Institute, where he was on the staff as physician and röntgenologist. The burns which ultimately caused his death were of long standing, but the diseases attendant on the work already occupy special attention in medical literature. His appointment as major in the army came after some years as lieutenant in the M. R. C., and he was keenly interested in x ray treatment for the wounded soldiers when he himself was bidden by that friendly enemy death to lay down his arms and leave others to carry on the war against disease.

WILLIAM MECKLENBURG POLK, M. D.,
of New York.

The seventy-four years which preceded the exit of William Mecklenburg Polk from this world last Sunday seem all too few for the curiously varied work he successfully carried through. West Point cadet, drillmaster onward to captain in the Civil War; Superintendent of the Alabama Iron Works

after the war, and, while thus employed, starting out to study medicine and surgery; earning the degrees and being soon on the staff at Bellevue Hospital. About 1878, he turned all his attention to obstetrics and gynecology and was made professor in those subjects at the Medical Department of the University of the City of New York, but fresh honors often called him from the bedside of frail women and the newly cradled babies. Cornell University elected him dean; the New York Academy of Medicine, president, and very long is the list of his other titles, but he will be remembered best by his gynecological work. That his deep knowledge of woman physiologically and psychologically had not prejudiced him against her, is evinced by the fact of his betrothal to a second wife when sixty-nine years old. That his work was good, is seen in the hundreds of lusty citizens who came into the world under his skilful guidance.

VALENTINE MOTT, M. D.,
of New York.

Some one has said that the "great business of life is to be, to do, to do without, and to depart," but it is not those who depart but those who are left who resent or weep because having "to go without" their old friend Valentine Mott, so suddenly called by death during an attack of angina pectoris last Sunday, at the age of sixty-five. A great man himself, he does not need his famous surgeon grandfather, Valentine Mott, to enhance his fame. The medical world knows his work at the Bellevue Hospital, the scientific world his researches with Pasteur when he was sent to Paris as representative of the American Pasteur Institute, and the writings and labors which occupied him after his return. A great traveler, India knew him; in European capitals, especially Paris and London, he was sure of a good welcome in medical and scientific circles, so that the news of his outgoing, swiftly sent over the Atlantic, will unite all in the feeling of an international loss.

News Items.

Women Cooks at Cantonment Hospitals.—It is announced that women cooks can be accepted in base hospitals of cantonments upon the special recommendation of the commanding officer of the cantonment.

Gas Proof Food Containers.—The War Department has issued a statement that the quartermaster's department is now supplying gasproof food containers for emergency rations, in the zone of operations in France.

Homes Offered for Hospital Use.—Henry C. Frick, George J. Gould, and S. A. Lewishohn have offered their homes on Fifth Avenue, New York, for the use of the police department, as emergency hospitals, should occasion arise.

American Optical Glass.—The War Industries Board announces that high grade optical glass is now being produced in considerable quantities, which is equal in practically every respect to the best European glass. This is very important in view of the need for microscopes and for spy glasses.

Permanent Staff for Hospitals.—The Secretary of War has issued instructions that every effort be made to prevent any changes in the staff of hospitals at the larger posts except in emergency. Buildings assigned to medical purposes at posts for hospital purposes must not be withdrawn except by authority of the War Department.

Eight Hour Law Suspended for Workers on Hospitals.—President Wilson has issued proclamations suspending the eight hour work law in connection with the construction of improvements at the St. Elizabeth's Hospital in the District of Columbia and of the Quarantine Station at Reedy Island, Del.

Red Cross Canteens.—The American Red Cross announces that efforts will be made to install canteens in the waiting rooms of all the large railroad stations. President Wilson has turned over the presidential suite at the Union Station, Washington, for use as a canteen for the entertainment of soldiers and sailors.

Health Officers Meet at Saratoga.—Some five hundred physicians and health officers from various parts of the State met at Saratoga on June 25th for the annual conference of health officials of the State. The meeting was presided over by Dr. Hermann M. Biggs, State Health Commissioner. Governor Whitman and Dr. Simon Flexner were among the speakers.

The Lowest Infant Death Rate on Record.—The New York Milk Committee has made a survey for the year 1917, which shows that the infant mortality declined from 135.8 per thousand in 1907 to 88.8 in 1917. The improvement is attributed in part to the medical and educational campaigns and in part to the efforts of the Milk Committee to improve the sanitary surroundings of infants.

The Women's Overseas Hospitals.—The National American Woman Suffrage Association states that a 100 bed hospital for gassed cases has been assigned by the French government to the Women's Overseas Hospitals. The association has been asked to recruit more doctors, nurses, and aids for the extension of the Labouhayre unit. This is the fourth unit supported by the association.

Trench Fever Tests.—The Secretary of War announces that a large number of American soldiers serving with the field hospitals and ambulance organizations volunteered to undergo a series of tests undertaken with a view to establishing the etiology of trench fever. Sixty-six men were selected and submitted to the various tests, which included the injection of blood from trench fever patients and being bitten by lice taken from trench fever cases. The names of the sixty-six volunteers have been published by the War Department.

A Clearing Hospital on Sixth Avenue, New York City.—The Greenhut building at Sixth Avenue and Eighteenth Street, has been taken over by the medical department of the Army, and will be converted into a receiving and clearing hospital. Invalided soldiers arriving from France will be kept there a few days, until permanent disposition can be made of them. The Sixth Avenue front will be used as a dining room, thus removing the wards as far as possible from the noise of the elevated railroad. There will be five wards of 700 beds each. The building is very large, the elevators numerous and ample, and a covered port will provide an ideal place for loading and unloading ambulances. It is easily accessible from the piers on both water fronts.

Voluntary War Nursing Aids.—The following resolution was adopted by the Advisory Committee of the Red Cross Teaching Centre, 453 Madison Avenue, on May 23, 1918:

WHEREAS, Major General William C. Cress, Surgeon General U. S. Army, has repeatedly urged the necessity of increasing on the part of the American Red Cross the number of trained and equipped nursing aids in military service;

WHEREAS, in the event of the war, the number of registered nurses available for military service may not be adequate to the demand;

WHEREAS, the Teaching Centre of the New York County Chapter is endeavoring to prepare women for Red Cross service as "non-professional voluntary war nursing aids";

WHEREAS, theoretical instruction given at the Teaching Centre should be supplemented by practical work under the supervision of competent and approved superintendents of military nursing schools, so as to weed out the unfit and those who did not conform to hospital rules and military discipline; therefore be it

Resolved, That the members of the Advisory Committee of the Teaching Centre of the New York County Chapter heartily endorse the suggestions made by Dr. S. S. Goldwater in the article appearing in the *New York Times*, May 15, 1918, and request the cooperation and support of the New York City League for Nursing Education in furthering this work; and be it further

Resolved, That a copy of this resolution be forwarded to the New York County Chapter of the American Red Cross with a request that copies be forwarded to the New York City League for Nursing Education, Dr. S. S. Goldwater, and the proper authorities in Washington.

Vassar Training Camp for Nurses.—Five hundred students have entered the training camp for nurses which was opened on June 24th at Vassar College. All the students are college graduates, 110 different colleges being represented.

Gas Masks for Horses.—About 5,000 gas masks for horses are being manufactured daily and are said to be more efficacious than any so far introduced, since they are impregnated with chemicals that will neutralize all known gases that will affect horses. They are being sent to France, and it is expected that every horse in the service will be equipped with a mask.

Women Establish Milk Stations.—Several milk stations have been established in northern cities by urban home demonstration agents of the United States Department of Agriculture and the State agricultural colleges. The purpose of these is to encourage a wider use of milk among the poor. In some places whole milk is handled and in others skim milk only is sold. All of it is bottled except that served in glasses over the counter to children. Community kitchens are being run in connection with the stations in some cities.

Major Slee in Command at Camp Crane.—In a recent issue of the *Philadelphia Record*, the Mayor of Allentown, Pa., publishes a letter expressing the high appreciation felt by the citizens of Allentown for the officers and men of the camp. They have been much impressed by the splendid character of the officers and men and there is hardly a home that has not adopted one or more of the soldiers, who, according to the mayor, have proved worthy of every confidence. Major Richard Slee, who has succeeded Colonel Persons in command of the camp, also contributes a note in reply to the mayor in which he lauds the work of Colonel Persons.

A Course in Mental Hygiene at Smith College.—The National Committee for Mental Hygiene has established a war emergency course at Smith College, Northampton, Mass., to prepare workers to assist in the reclaiming of soldiers suffering from nervous and mental diseases, including war neuroses and shell shock. The committee in charge includes Dr. E. E. Southard, of Boston, chairman; Dr. William Russell and Dr. L. Pierce Clark, of New York; Dr. Walter E. Fernald, of Waverly, Mass., and William A. Neilson, president of Smith College. Miss Mary C. Garrett, chief of the social service at the Boston Psychopathic Hospital, will be director of the course, which will cover eight months.

The Army Nurse School.—Miss Annie Goodrich, chief inspector of the United States military hospitals in this country and in France, has been appointed dean of the new Army School of Nursing, with headquarters at the Surgeon General's office in Washington. Nurses will be enrolled and the general management will be cared for there, but training units will be provided from the various base hospitals with a complete equipment of teachers and instructors. The course leading to a diploma is to extend over a period of three years. The experience in the military hospitals is to provide surgical nursing, including orthopedic, eye, ear, nose, and throat, and medical nursing.

Experience in children's diseases, gynecology, and public health nursing is provided through affiliations with civil hospitals and visiting nursing organizations.

The course will be held at the Army School of Nursing, Washington, D. C.

Preparing Against Tuberculosis.—Until recently, but little provision had been made in France for the care of repatriates. These are the old men, old women, the very young, and the invalids returned to France by Germany from the captured areas, because they were no longer useful to their captors. Among these are many consumptives, the refugees having been subjected to great hardship. The American Red Cross has undertaken to aid in the preparation of these repatriates.

The American Red Cross is preparing to send a large number of nurses to France to care for the repatriates. These nurses will be specially trained to care for tuberculous patients from the army who may need attention before sailing for the United States. The Red Cross is also preparing to send a large number of nurses to France to care for the repatriates.

THE AMERICAN MEDICAL ASSOCIATION

Sixty-ninth Annual Meeting

Held at Chicago, June 10 to 14, 1918

(Concluded from page 1208.)

The Scientific Proceedings

SECTION IN DISEASES OF CHILDREN.

Conservation of Child Life, a National Responsibility.—The chairman of the Section, Dr. LAURENCE R. DE BUYS, of New Orleans, in his opening address, called attention to the fact that the conservation of child life was more than ever before in the history of the world, of supreme importance, although one sometimes overlooked by the generality of the medical profession who, in the hour of their military importance, sometimes forgot they had all been babies themselves. The medical profession, in common with other organizations for the conservation of national integrity must now interest itself in saving the lives of the babies, because it was upon these that the future life of the country depended. It was natural for the medical profession to desire a commission in the Medical Reserve Corps, but the pediatricists and those engaged in child welfare work should feel, and be encouraged to feel, that they were rendering as great a service by staying at home and "playing the game" as those who had gone overseas. America was benefiting by the experience of Europe in many ways, and should also share the recognition of the necessity of conserving the child life. Attention—one might say consternation—had been aroused in many directions by the statistics showing the large loss of life from premature birth, death in utero and infant mortality, as well as of the finding among the drafted men some twenty-five or thirty per cent. of physical defects that might have been remedied in childhood, or prevented altogether. The prenatal period, even the preconceptual, the parturitional stage, the period of infancy, the preschool and the school ages and adolescence should all be allotted their quota of attention. The cooperation of the lay public and its various organizations was essential to the effective operation of this plan, but, above all, it was important that those specially skilled in caring for mothers and children should guide these efforts. According to the most reliable statistics obtainable, 540,000 infant lives were lost annually, and it was estimated that 250,000 of these deaths were preventable. A campaign had been started to save 250,000 at least of these babies annually. There was nothing that could be so reassuring to the brave soldiers who had gone into the trenches to fight for a high principle than to have them feel that their wives and babies were being looked after.

According to the value placed on a human life by Dr. Irving Fisher, the saving of 150,000 lives now would mean in twenty years an equivalent of \$3,014,001,500. Furthermore, this saving would be increased later because the children saved would themselves in time become parents. Throughout the States there should be uniform registration.

Infant Mortality Campaign in France.—Dr. PAUL ARMAND-DE LILLE, Paris, France, reviewed the work done in France in the effort to lower infant mortality, both before and since the beginning of the war. Previous to the end of the nineteenth century, the infant death rate in France was very high, but about this time it notably diminished and continued to diminish until the beginning of the war. The first campaign in France in favor of maternal nursing was due to Jean Jacques Rousseau. That every French mother practise it was the primary object of the League Against Infant Mortality. The scientific progress of the nineteenth century demonstrated the necessity for the true science of puericulture which had been constructed for the children following the word of Dr. Pierre Budin, founder of the first children's clinic. The Hôpital des Infants Assistés at Paris and the Service of the Interior had an official organization of the various orphanages, notably those of St. Vincent de Paul, but the mortality being great among these large groups of children, the great government charity of France, the Assistance Publique, organized the placing of children individually in peasant families in the country under administrative and medical supervision. In the great cities and industrial centres there were also many crèches, or day nurseries, and an Association for Aiding Pregnant Women which gave an indemnity during the period of confinement and nursing to the working women of the manufacturing districts. This society, the Mutualité Maternelle, had caused a decrease in infant mortality of at least seven per cent. Through the Loi Roussel, which aimed to protect children placed by their mothers in nursing homes, every child confided to a wet nurse came automatically under government supervision, and the woman who cared for the child was required to furnish certificates embodying her qualifications. The Paul Strauss law protected the mother during pregnancy and the mother and child for four weeks after the confinement, the Government providing an indemnity for this purpose. There was also a law for the aid of large families. There were Baby Clinics, les Consultations des Nourrices, throughout the country, with the attendant Goutte de Lait which aimed to diminish infant mortality by giving the mothers encouragement to nurse their children, supplying them with sterilized milk to supplement any deficiency and giving rules for artificial feeding when necessary. Since the first Goutte de Lait, many others had been established, and mortality had been reduced in their localities about fifty per cent. Since the beginning of the war special provision had been made for the mothers working in munition factories and other institutions as well as for their infants and the older children, particularly in reference to diet, hygiene and sanitation. Since the beginning of the war the problem of conserving infant

life had been more difficult because all physicians between the ages of twenty-five and forty-five had been mobilized. The birth rate too had fallen markedly, due to the great number of young married men in the service and the decrease in the number of marriages. The problem of infant mortality, however, was so vital that since 1916 many societies had been formed to handle it. In all the large cities asylums had been opened for pregnant women, Consultations des Nourrices, crèches, existed. Under the auspices of the Ligue Contra La Mortalité Infantile a Central School of Puériculture had been founded in Paris and lectures had been given on this subject. In 1917 the American Red Cross arrived in France with its special department, the Children's Bureau, and their aid was accepted with the deepest appreciation. An Infant Welfare Exhibit was organized, with great success, and a course for visiting nurses started. The establishment of a Consultation des Nourrices, supplemented by the services of a visiting nurse, in as many localities as possible throughout the country would undoubtedly serve to counterbalance the increase in infant mortality which had existed during the duration of the war and which was largely the result of economic conditions.

Medical Work Among the Civilian Population in France.—DR. WILLIAM PALMER LEUCAS, of San Francisco, affirmed the absolute accuracy of the statements in Dr. Armand De Lille's address. The French were the first to effectively carry out the idea of child welfare work which was started by Dr. Pierre Budin and taken up all over France, even small towns having infant welfare stations. As a member of the American Pediatric Society and of the American Red Cross, he was very glad to give an idea of the nature of the propaganda being conducted on French soil, especially by the Children's Bureau. The situation in France had demanded assistance from her Allies, for, practically, every physician in France was in military service. A great many of the children's institutions had been closed down and the admirable work had paused. In relieving this situation the Red Cross had acted promptly and in accordance with the principles of its foundation. The work was started at Toul, which was practically under shellfire and aerial bombardment, being only a little over twelve kilos back of the firing line, but from here the children were removed to large colonies elsewhere, some of them having between five and six hundred children. In two or three places there were maternity hospitals in connection with the children's hospitals. The work outside these colonies was conducted through traveling dispensaries covering a specified radius and clinics were held at the various towns and villages several times a week. Half the physicians were women, and there were many nurses and nurses' aids. The bureau's personnel numbered about 400 though it sometimes varied. Most of the work was of the ordinary type done in civil life, but occasionally it had been possible and necessary to take an active part in caring not only for refugees but for wounded from the front. A simple child welfare plan for all France had been worked out which involved three principles: reestablishing as many consultations as possible; the education and preparation of health visitors, and educational cam-

paigns with exhibits. If the American Red Cross had done nothing else but create a good morale among these bewildered and suffering people, such work would be worth while. They had been brought to think of themselves and their families and to concentrate on the importance of child welfare work. The infant mortality rose very high in France during the second year of the war, but during the last it had come down considerably. The important point, however, was the matter of the reduced birth rate which emphasized the importance of all child welfare work. At the present time it was between forty and fifty per cent. below the normal death rate which made anything in the nature of infant welfare work very vital.

Children's Year Program for Child Conservation in War Time.—DR. GRACE L. MEIGS, of Washington, D. C., said that in the nationwide concentration on the war, France had not at first taken into account the welfare of the children and the high mortality rate following economical conditions and the falling birth rate consequent upon the departure of all the young married men for the trenches, but had had the matter suddenly brought home to her. It was time for America, before the departure of the millions of young men overseas, to take steps to safeguard the children. Medical men should take up the problem and see that reform was started in the right direction. The Children's Bureau had undertaken a campaign to save 100,000 lives during the second year of the war, and was working in co-operation with the Child Welfare Department of the Woman's Committee of the Council of National Defense as well as the Child Welfare Committee of the General Medical Board of the Council. This section should go on record that it would take an active part in backing up all child welfare work. Europe had awakened to the necessity of caring for its children because of the falling birth rate, and although this country had not yet to face this problem, it was probable it would have to be met later if the war continued. It was a fundamental fact that the infant was the first to react to economic conditions, and to this cause could be attributed the effect of the war thus far on the children. There were throughout the country an inestimable number of children suffering from undernourishment because of the high prices of commodities, of foods essential to the maintenance of health. Immediate and thoroughgoing measures must be taken everywhere. The campaign to save the children, which was started on April 6th, the first anniversary of America's entrance into the war, would continue to do all that was humanly possible to protect the lives of those at home, and especially the children.

Clinical Supervision of the Well Baby during Its First Year.—DR. HENRY H. YERINGTON, of San Francisco, described the plan of organization of the pediatric clinic of Stanford University, which permitted one man to follow up the cases throughout. It was an illustration of the need of supervision in the home. In France, some years ago in founding asylums in San Francisco the mortality was very high, but this was tremendously reduced by boarding the infants out, and still further reduced by subsequent careful supervision. The

clinic for healthy babies had been in operation since September, 1917. It included provision for prenatal care, maternity service, an outpatient department, the hospital, and a complete follow-up system. There was a very close association between prenatal and adolescent care. Social service workers kept careful records, and careful supervision was carried out in reference to hygiene, sanitation, diet, etc. During the time the clinic had been in operation the social service workers had made 2,146 visits. Of 290 cases cared for in the maternity hospital, the greater number returned to the clinic for subsequent supervision of the babies, who were brought there once a week for the first three weeks, once every two weeks from the third to the sixth month, and once a month from the age of six months to one year. These babies were a little above the average weight at birth. Every effort had been made to see that they were breast fed and that the mother's milk was sufficient. In this respect the examination of the breast milk was of less value than the clinical signs of a diminished milk supply. When breast feeding was impracticable, modified milk was given, and cane sugar was used with either maltose or dextrose. The diet of the children was very generous, and its regulation included both the caloric and percentage methods.

A Report of Three Years' Clinical Experience with the Feeding of Synthetic Milk Adapted.—

Dr. HENRY J. GERSTENBERGER, of Cleveland, Ohio, reported practical results in 400 cases of feeding with synthetic adapted milk during the past three years. The value of this food lay in the fact that it approximated normal breast feeding by adapting the fat of the artificial milk to the fat of woman's milk, and required only a change in quantity, so that the infants were fed as if they were receiving breast milk. It was easily made and the cost was trifling. There were many instances in which it was very difficult to find a suitable milk modification, and it was almost impossible to find one that infants under one month of age took well. There were many children who did not thrive on modified milk mixtures, and quite a few had slight rickets, and none of them did as well as those who were breast fed. This preparation came closer to breast milk than anything so far in use. A combination of one third skim milk, seven per cent. sugar and three per cent. homogenized cod-liver oil formed the mixture. Of the 400 infants fed with it, some were removed from the food before the sixth week of feeding for various reasons, but there were 311 cases that received it for more than six weeks, and a great many had been fed for from eight to ten months with excellent results. Eleven died, but from causes remote from any association with feeding. In all cases the stools were normal except in a little over ten per cent., in which they were constipated, a result very different from the stools obtained by Rahrdt with Friedenthal's modification. This would seem to prove that the assumption that a high lactose content in food was responsible for dyspeptic stools, lack of appetite and vomiting, was incorrect. The hemoglobin determination remained normal in the babies fed from twelve to thirty-four weeks on the mixture, and

in every instance the electric excitability remained normal. The babies grew in measurement like the breast fed infants, the gain in weight per week being that of the normal average. As far as known, any food similar to breast milk in its protein would produce perfect nutritional results, without the aid of butter fat. None of these infants had rickets, spasmophilia or anemia, but it might be well to sound a warning that this milk would produce scurvy if pasteurized unless an antiscorbutic was administered. It had the further advantage in that it very greatly simplified infant feeding, especially in prophylactic dispensaries and infant welfare stations.

Digestion of Fat by Gastric and Intestinal Ferment.—Dr. JAY I. DURAND, of Seattle, presented his conclusions following a number of experiments in regard to the digestion of fat by gastric and intestinal ferments, by a modification of the Trauber method. His conclusions were: stomach lipase followed by pancreatic lipase gave an increased rate of splitting over that given either by both simultaneously or alone; the pancreatic lipase was destroyed during the action, or so combined that its rate of action was greatly retarded; this fact, rather than any preparatory change in the substrate by the action of the gastric lipase, probably explained the finding; the duodenal lipase action was retarded when in the presence of gastric juice; the duodenal lipase in equal quantity of duodenal juice was from 250 to 500 times as active as the gastric lipase in an equal quantity of gastric contents when taken by the method used in the experiment.

The Significance of Infection of the Accessory Sinuses of the Nose in Infants and Children.—Dr. ALBERT H. BEIFIELD, of Iowa City, expressed his opinion that overemphasis might have been placed on tonsils and adenoids as containing the focus of a general infection. In studies pursued in the search for the cause in cases of chronic deforming arthritis, he had observed that the removal of the tonsils and adenoids did not always control the disease process, and the source of infection was still obscure until the accessory sinuses had been found to be infected in a number of such cases and, after treatment in that locality, the progress of the disease had been arrested. The frequency of sinus disease was very much greater than generally recognized, and its possibility as a focus of infection deserved more attention. It had been found to be the underlying etiologic factor in a series of cases of cyclic vomiting, infectious deforming peri-arthritis, asthma, persistent cough, occult temperature, pyelitis, chronic digestive disturbance, and poor general health. Certain diagnostic signs indicated affection of this region, and in addition radiography and exploratory puncture were of value in the diagnosis. The family history should be carefully included in the prediagnostic consideration; there were some families in which considerable mucous membrane congestion and inflammation existed, as was instanced very recently by a family in which three members developed sinusitis within a very short period of each other. The most frequent symptoms of accessory sinus disease were chronic purulent nasal discharge, sneezing, nervous irritability, and headache. In regard to treatment, the

speaker considered that medical means should first be resorted to unless immediate surgical relief seemed to be indicated by the condition of the patient.

SECTION IN GYNECOLOGY, OBSTETRICS, AND ABDOMINAL SURGERY.

The Relation of Anomalies of the Bile Ducts and Bloodvessels to Accidents in Biliary Surgery.

—Dr. DANIEL N. EISENBRATH, of Chicago, presented this paper. He considered that the experience gained by the surgeon was more advanced than the textbooks. Many cases had occurred in which the hepatic ducts had been severed. Abnormalities of the ducts and arteries should be studied, and accidents to the arteries and ducts reported, thus one surgeon's experience would correct the mistakes of others. Such mistakes were due to three reasons: first, the views in regard to anatomy were out of date; the anomalies of the vessels were not known; third, the normal land marks were often obliterated. Two Frenchmen, Rio Branco and Descomps, had written admirable works on this subject, their statistics showing that the normal angular junction of the ducts was found in seventy-five per cent. of cases, but three other forms of union had been noted (a) the parallel type, (b) the anterospiral type, and (c) the posteriospiral type. The first could be divided into: short parallel type; (b) long parallel type. The anomalies of the arteries were divided into those: in which the hepatic artery crossed the hepatic duct; in which it ran parallel; in which it made a wide arch behind the duct. The cystic artery might either: cross the hepatic artery; occur in a double form; cross the common duct. The gastroduodenal artery occasionally crossed the common duct. In one case a double cystic artery had misled the writer into cutting the second branch and an accidental hemorrhage occurred. These anomalies of the vessels and ducts undoubtedly accounted for a large number of accidental hemorrhages which occurred in biliary surgery.

Abdominal Visceroplexy.—Dr. J. RIDDLE GOFFE, of New York, made this presentation, saying that visceroplexy was undoubtedly due to careless habits of carriage of the body with the resulting lack of muscular tone. It gave rise to many symptoms, such as localized pain and distress, interference of function, constipation with consequent accumulation of toxins in the body and in the circulating blood. A neuropathic condition of the patient occurred as a result. Neurologists considered that the various toxic conditions, such as alcoholism, fright, infections, etc., caused circulatory changes by the action of toxins on the autonomic nerve centres which in turn caused alterations in the viscera. Various schools proposed different forms of treatment. The internists sought to eliminate toxins; the orthopedists to relieve false positions; the neurologists to cure the neuroses. The broad minded surgeon should include all these therapeutic measures in his armamentarium and try to carry the patient beyond the point where relapse might occur. In complete ptosis nothing but surgical means would be of any avail. The speaker showed lantern slides illustrating the technic of an original method of abdominal visceroplexy which had given excellent results. Four

incisions were made, one above, one below the umbilicus, and one on each side of it. This treatment was used in conditions where complications had occurred, such as ptosis of liver and kidneys. Many of the patients had been under treatment for many years and were completely relieved by this operation.

Avoidable Traumatic Abdomen.—Dr. JOHN B. DEEVER, of Philadelphia, said that the finding at operation of a pair of eight inch hemostatic forceps which had been left in the abdominal cavity at an operation done twelve years previously by an unknown operator, led him to think seriously of discussing the unnecessary trauma which such an oversight might cause, and, in this also to consider other avoidable abdominal injury, such as perforation and rupture of the uterus, which with proper instruction, technic, and judgment could also be avoided, at least in the vast majority of instances.

The warning note was particularly necessary today, when the wastage and the demands of warfare made it more than ever imperative to bend all efforts toward conserving life, preventing suffering, and unnecessary drain on the service of the sadly depleted staffs of the civilian hospitals.

The Use and Abuse of Pituitrin.—Dr. GEORGE W. JONES, of New York City, referred to the widespread and unlimited employment of this drug in obstetrics, claiming that the now extensive clinical data published warranted the formulation of definite indications for its use. No satisfactory standards had as yet been devised, the physiological basis being unwarranted because of the specific variations in the potency of the extract. Moreover, other organic substances would stimulate the isolated uterine muscle directly. Indications for use of pituitrin were limited to the simple uterine inertia multiparae without fetal or maternal dystocia and a patient not exhausted. The author's personal experience and observations of cases referred to the Lying-In Hospital, had led him to add his confirmation to the warnings already published.

The use of pituitrin in Cesarean section was not as certain as that of ergot, and could not be regarded as a substitute, being merely an aid to forceps in certain cases where stimulation of the uterine contractions might drive the head to a more suitable level for instrumental delivery. Pituitrin was of especial value in curettage for incomplete abortion, also useful in metrorrhagia of young girls and in older women with small fibroids or inflammatory lesions in the adnexal regions resulting in hyperemia.

Pus in the Female Pelvis.—Dr. JOHN Y. BROWN, of St. Louis, Mo., discussed the paper referred to the views of Lawson Tait on pus tubes that had formerly created great controversy. Many cases ended in complete recovery without operation; these were not the cases seen by the specialist, and patients often went on to chronic invalidism. This question had two sides. Peritonitis following salpingitis was of rare occurrence, and many cases doubtless recovered without operation, but where acute exacerbations occurred it was wiser to postpone surgical intervention. Simpson recommended putting the patients to bed for three weeks without operation. It was hard, however,

to believe that multiple abscesses could subside with this conservative treatment. Incomplete surgical work was also responsible for an immense amount of suffering. It would be unnecessary to discuss the technical details of this condition, because each case was a law unto itself and the surgeon must work out the individual problem. The question of drainage was highly important. The intestines were lifted out of the cul-de-sac and a gauze roll inserted, the end being brought out through a thin rubber tube. Conclusions were that many cases might recover without operation; ninety-eight per cent. tended to become quiescent. Operative work should not be undertaken when in the acute stage; but, when undertaken, should be radical in the extreme.

Rectal Surgery for Pelvic Abscess.—Dr. HARRY P. RITCHIE, of St. Paul, Minn., made this presentation. In certain cases of peritonitis where vaginal section was unsuitable, this operative route was very efficient. Often after pelvic abscess a secondary operation became imperative in order to establish drainage, and, in these cases, so disturbing to the patient and to the surgeon, it was often far easier to drain by the rectal route than to do another abdominal operation. The mass was often clearly felt on the posterior wall, and puncture only obtained a very small amount of pus. If the pressure could be removed by this simple route, the patient could be very much improved. This method was by no means a last resort operation; it filled a very useful rôle as a secondary operation in complicated cases. In the female there was no particular advantage over vaginal section, so that this operation was advocated for male patients. If puncture of the bladder occurred, it should be immediately repaired. The points of operation were dilatation of the sphincter, incision, and the insertion of the rubber tube. Repeated observations were necessary, as changes might occur in a few hours. In certain specially indicated cases this operation would solve the problem.

Treatment of Incisional Ventral Hernia by the Transplantation of Fascia Lata.—Dr. WILLARD BARTLETT, of St. Louis, said: These lesions with the ring and sac were due to stretching and atony of the muscular coats of the abdomen, due to nerve section at previous laparotomies. Ninety-one cases were analyzed, in twenty-four of which were his own. There was known cure in sixty-one cases and six failures, two of the latter being due to implant of wire filigree, and four to overlapping. This procedure was only indicated where the tissue was not too thin to hold in place. Among etiological factors were: post operative vomiting in seventy-five per cent.; meteorism in seventy-three; drainage in eighty-six per cent.; wound suppurative in seventy-five per cent.; constipation in sixty-six per cent.; dysuria in twenty-five per cent.; gain in weight in eighty-six per cent.; muscle strain in thirty-five per cent.; pregnancy in eight per cent.; herniotomy in thirty per cent. A post operative gain in weight, an important factor, meant increased intrabdominal pressure and weakening of the wall. This combination of factors resulted in hernia. Hernial tendency also seemed to play a strong rôle in producing this lesion. Repair to the damage in

the wall, as well as treatment for increase of pressure must be instituted. Attention was directed to cardiac and respiratory conditions; to weight reduction; to constipation and urinary retention; to prevention of vomiting and meteorism. Tight closure of the abdomen often caused a rise in blood pressure and this was to be avoided. No one operation was indicated, but in the majority a transplantation of the fascial flap would be valuable, either by itself, or superimposed on some other method. A technic was illustrated by which this was done by the one operator, at one operation. Methods of treatment were by reconstruction of the wall; by flap inversion; by filigree wire work only in emergency cases; finally by free fascia transplantation.

The Use of the Rubber Band in Abdominal Surgery.—Dr. JOHN W. KEEFE, of Providence, R. I., presented his second communication on this subject as he felt that the advantages of this method justified emphasis. These included: less adhesions, less shock, less hemorrhage, and less danger of leaving a foreign body in the wound, the wound itself healing more easily and the after symptoms of discomfort markedly decreased. Any device which made the operation safer and more comfortable for the patient should be welcomed. The leaving of gauze drains and sponges in a wound by the surgeon seemed unpardonable to the layman. The multitude of devices by surgeons for preventing such accidents, showed that none were entirely successful. According to the work of Randall Henderson, carbon dioxide loss was productive of acapnea. The use of the rubber roll eliminated this feature. Sterilizing by boiling was easy. Impermeability to air and moisture was effected. The prevention of shock and adhesions should make this appliance worth the consideration of the profession. Dr. Goldsponh, of Chicago, said that he could speak very favorably about its use. For the past two years he had used this device with great success, and it had made a great difference in the comfort of the patients by the avoidance of gas, tympanites and shock. Pituitrin had also been used during the same period, so that it was hard to say which of the two measures had the greater effect.

Paravertebral Anesthesia: Report of One Hundred Cases.—Dr. N. R. MASON and Dr. F. C. W. KONRAD, of Boston, considered the form of anesthesia, combined with scopolamine-morphine seminaresciosis, the ideal one when reduction of surgical shock was of paramount importance in those cases classed as poor surgical risks, or those so handicapped as to be practically inoperable. Twenty-six such cases were analyzed. They included carcinoma of the cervix during pregnancy; malnutrition, arteriosclerosis and senility in an extreme postoperative ventral hernia; toxemia of pregnancy with termination of the pregnancy after the pulse had risen above 140 per minute; failing cardiac compensation in pregnancy; blood pressure of 240 millimeters with fibroids of the uterus; diabetes; ether idiosyncrasy; delirium tremens; active pulmonary tuberculosis. In no case was there any untoward symptom after anesthesia except in the case of alcoholism. One case with ulcerating procerdientia died seventeen days after, of pneumonia. The reduction of shock was most marked, the only sensa-

tion being noted was the the first prick of the needles. Additional ether was given in one or two cases during the operation, but later studies tended to show that this was an unnecessary procedure. In some cases the packing back of the intestines seemed to occasion discomfort. A certain class of patients registered any sensation as pain by crying out or struggling. Certain islands of memory remained, but there was no definite reconstruction of the picture. In order to do the nerve trunk anesthesia the patient was placed in a sitting posture with the back arched. The skin was prepared with iodine and alcohol. The sixth dorsal and the third lumbar were located. In anesthesia of the neck the column was entered from the side. The coccyx was approached by the second sacral foramen. The needle used was 9/10 centimeter in diameter and of five centimeter capacity. Bright light, loud noise, or any disturbance made the patient restless during operation. A preliminary dose of veronal was given the night before and the injection of scopolamine-morphine two and one half hours before operation. This was repeated as often as necessary. There was no contraindication to the method unless immediate anesthesia was required.

The Pathology of Hemorrhagic Myomas and Their Relation to Sarcoma (lantern demonstration).—Dr. A. E. HERTZLER, of Kansas City, reminded his hearers of the clinical significance of certain types of myomatous degeneration. That, and the development of hyalin degeneration of the vessel walls being illustrated and it was shown that hemorrhage into the tumor substance was due to changes in the vessel walls. The time of hemorrhage in some myomas could be determined by the clinical history of the case. This was due to increased vascularization during development. An interesting point was the chemical change in the blood, a lytic power being developed and a lack of calcium being found in the exudates, although just what significance this had was not as yet known. The whole question of sarcomatous development from hemorrhagic myomas was probably strictly a chemical proposition.

The Radical Treatment of Cancer of the Cervix by Igni Exstirpation.—Dr. E. A. WEISS, of Pittsburgh, considered radium and x ray treatment as palliative measures only. The Wertheim operation was admirable, but there was a high primary mortality, the incidence of infection, hemorrhage, shock, and of recurrences was high in operations on cancer of the cervix. Consensus of opinion showed that cautery by heat produced the best operative results with this technic. Forty-five per cent of patients survived the five year period. In Wertheim's operation twenty-five per cent. survived the five year period. In the Werder operation the cautery effectively prevented recurrence at the site of operation by implantation of cancer cells. Large blood-vessels were easily controlled by the cautery with the Down's electric endotribe. This absence of bleeding tended to eliminate shock. A Percy flat blade, heated to a dull red heat was most satisfactory. A high amputation of the cervix could be effected without bleeding, care being taken to manipulate the cancer mass as little as possible. In searching for metastases it should be remembered

that thickening of the tissues might be merely inflammatory. In doing the operation, injury to the bladder and ureters was avoided by drawing the ureters aside and retracting the bladder. The knife was applied to the parametrium, the ligaments being made tense. Advantages of this method were the lowered mortality, less pain and shock, and smooth convalescence.

The Age of Menopause: A Statistical Study.—Dr. K. I. SANES, of Pittsburgh, Pa., presented eight statistical charts on the menopause.

Chart No. I, according to the data collected from literature (thirty-two nations), showed that the Caucasian races reached the menopause somewhat later than the Indian, the Indian later than the Mongolian. The data on the Ethiopian races are so meagre as to be of no value. The northern races, according to literature, cease menstruating later in life than the southern. The warmer the climate the earlier the menopause. Striking exceptions to this general statement were cited and, as possible explanation, the fact of racial admixture, local climatic peculiarities, and various social differences. The 708 menopause patients collected from the author's case records showed an average of climacteric age of 47.1.

In Chart No. III pelvic disease seemed to have influenced the average age of menopause in 265 cases. Among the diseases showing a higher average than the above cited were: fibroids, 47.96 years; adherent retroverted uteri, 47.71 years; endometritis, 47.65 years; uterine cancer, 47.33 years. Adnexal inflammation showed about the same as the general average, 47.03. Among the diseases with a menopause age below the average were: unadherent retroverted uteri, 45.84 years; relaxed pelvic floor cases, 45.62 years; ovarian cysts, 44 years; underdevelopment and atrophy of sexual organs, 39.46 years. Excluding from the total number of patients the cases with pelvic pathology the author obtained an average menopause age of 47.005, a very slight difference from the general average.

Most of the 115 menopause cases of Chart No. III with chronic general extrapelvic pathology showed a higher menopause average than normal: cardiovascular disease, 48.6 years; gout, 48 years; diabetes, 47.9 years; cholelithiasis, 47.7 years; moderate hyperthyroidism, 47.5. Chronic nephritis cases showed the general average of 47.1. Lues, 47.7. After excluding the extrapelvic and pelvic pathologic cases from the total number, 283 cases were left with an average menopause age of 46.73, but the extrapelvic diseases with the exception of the twenty-nine cases of hyperthyroidism and lues were so common past middle life and so frequently developed during the menopause that they cannot be considered as causative factors in the climacteric delay. Thus the author found in 373 cases forty-seven years as the average age for cases without important pathology. The highest percentage of 567 cases analyzed in Chart No. II reached menopause at the forty-eighth and the fiftieth year. 81 1/2 per cent of the total number ceased menstruating between forty and fifty-five. The age of menopause, according to Charts Nos.

IV, V, and VI, seemed to be influenced by the age of puberty, the age of marriage, number of children, and by the age at last childbirth. According to Chart No. IV, based on 554 cases, the later the onset of puberty the later the menopause period. The very early and very late puberty cases seemed to reach menopause very early.

Cases of late marriage, according to Chart No. V, based on 621 cases, ceased menstruating late. The unmarried seemed to reach their menopause earlier than the married. Chart No. VI, based on 487 cases, showed that the larger the number of children or pregnancies the later the age of menopause. Spinsters seem to have a slightly lower average than the married nulliparae. Chart No. VII showed the later in life the last pregnancy occurred the later was the onset of menopause. In sixteen cases it was established immediately after the termination of a pregnancy, thirteen before forty-seven years of age, and three after forty-seven. There seemed to be some relation between the menstrual characteristics in cases in whom no pathology was found (Chart No. VII based on 388 cases). Menorrhagia cases showed the highest menopause age; next, the cases with normal flow, then those with scanty flow. Cases of dysmenorrhea and those with irregular menses seemed to have ceased menstruating at an earlier age than normal. There also seemed to be a definite relation between menopause and severity of symptoms (Chart No. VIII, based on 390 cases). A higher average of menopause age among the cases with mild or no climacteric symptoms was found than in cases with severe or moderate symptoms.

How Surgeons Can Help Win the War.—Dr. FRANKLIN H. MARTIN, of Chicago, gave an informal talk on this subject. Men were under the impression that an obstetrician should remain home and take care of the women. It was important, however, that all abdominal surgeons who were eligible for the Reserve Corps, should immediately enroll. Those not eligible for the Reserve Corps should remain at home, whether obstetricians or abdominal surgeons. There was no man or woman more needed at present in the service than the abdominal surgeon, and none were better equipped to do war surgery than they were. They had no reason to think that they were not particularly needed, no reason to be complacent in any way, for, since 1914, no one could say we were winning the war, and no class of officers were more needed than doctors. According to official tables of the enemy, one doctor was equal to a great many fighting men, that is, to some five hundred to one thousand. Men asked such questions as, "What was to be done with the home people? With the medical schools? With public hospitals? With private hospitals?" With full appreciation of these points, Doctor Martin said he would impress on them that none of these things counted in comparison with duty to the country. If every man eligible for the Medical Reserve Corps were to go, still there would be fifty per cent. of the men left to carry on the work, and all the women. The University of Pennsylvania Medical School could not be run as efficiently as it had been for twenty years, but still it could go on,

and men like Deaver and Martin were needed far more at the front, and never more needed than now. Those who had already left their hospitals and institutions were working sixteen to twenty hours a day.

Teaching here was not nearly so important a matter as the demand for action over there. The question which men were to remain at home and which should go abroad was to be settled by the arrangement of the Volunteer Service Group. Doctor Martin said he expected men would come to him after the meeting and say, "Doctor, I want to help my country." The man would be informed that this was the simplest thing in the world. He had to go to headquarters and fill in the forms distributed by the Surgeon General and stating when it would be convenient to come. The man might then say, "Well, doctor, that is all right, but—" Then he would proceed to argue: he had an expensive family; he had a private hospital on his hands; he could perhaps do better if he stayed at home to teach. He would *not*. The man who made that statement was a conceited ass. He was not needed here so much as over there, no matter who he was. If not eligible for the Reserve Corps, there was another course open: He could write to the Medical Department or the Council of National Defense, asking for papers for the Volunteer Reserve Corps, which was open to all men and women not eligible to active service. After having made the application and proving his eligibility, the insignia was to be received and the man accepted as a volunteer. The Government had work for every one, but it, and not the man himself, must make the choice. He had only to be willing to accept the decision of the Government, unless he wished to be classed with the pacifists and the disloyal. A man should enroll in the Medical Reserve Corps or with the Volunteer Reserve Corps.

The Question of Operation in Abdominal Gunshot Injuries.—Dr. J. R. EASTMAN, of Indianapolis, began by saying that at the beginning of the war, two schools of surgery existed in the armies of the belligerents—the abstentionists and the interventionists; the first had to wait to make a diagnosis, the second made the diagnosis by laparotomy. The course of the missile in gunshot wounds was often difficult to determine. Generally speaking, the closer the wounds of entrance and exit, the less danger was there of perforation. A missile even occasionally passed out through the rectum without perforating. Protrusion of the bowel indicated perforation, the symptoms of which were pain, vomiting, costal breathing, shock, retraction of the testicle, meteorism, tympanites, and intraabdominal hemorrhage. The class of wound depended to a great extent on the type of missile, the smooth bullet producing little laceration, but great damage being done by larger shell fragments. Shrapnel bullets tended to remain imbedded in the abdominal coverings and did comparatively little visceral laceration. The time of transportation of the wounded had direct relationship to operability, the mortality increasing with each hour of delay in transport. In small, nonpenetrating wounds conservatism was indicated. Records since the begin-

ning of the war showed that the interventionists had a record of fifty-nine per cent. mortality, as against seventy-seven per cent. among the abstentionists. The deaths after intervention occurred at once; those after abstention occurred in later stages, from fistula, etc.

In nonoperative cases, the patient was put to bed with shoulders raised and knees flexed. Opium was given to control pain. Shock was combated by injection of normal salt solution. Stomach wounds showed certain peculiarities. In perforations of the anterior wall there was no outpouring of the gastric contents into the lesser peritoneal cavity; the contrary was the case with wounds of the posterior wall. This was due to some peculiarity of visceral hydrostatics. In gunshot wounds of the liver, the hemorrhage was often found to subside spontaneously. Occasionally associated injuries of the thorax and abdomen occurred. Men had been known to cough up a bullet from an abdominal injury by way of the lung. Multiple injuries of the chest and abdomen were also encountered.

SECTION IN SURGERY, GENERAL AND ABDOMINAL.

The Principles of Thyroid Surgery.—Dr. C. H. MAYO, of Rochester, Minn., in his address on this subject, said the thyroid was undoubtedly one of the most important glands in the body, and while we were far from a complete knowledge of its activities, the work of Plummer and Kendall, through investigations into the physiologic action of its secretion, was such as to bring us to the verge of a realization of its fundamental effect on life. Kendall had been able to separate the compound of the thyroid containing iodine from the balance of the gland, accomplishing this by destroying the proteins of the thyroid by means of boiling with a strong alkali, which did not decompose the iodine containing compound, and, by suitable treatment, could be separated as a pure crystalline substance containing sixty-five per cent. of iodine, its formula being $C_{11}H_{10}C_3Ni_8$. The compound contained an organic nucleus called indol, as well as oxygen. Investigation of the activity of the gland showed the iodine to be not directly involved in the functioning of the substance, but merely increasing its power to react.

Plummer, from a clinical standpoint, resulting from observation of many thousands of cases of goitre, numerous cases of cretins and of myxedematous patients, had shown that the rate at which energy was produced by the animal organism was controlled by the amount of thyroxine acting within the cells of that body. While not the only factor influencing the rate at which we lived, it probably had more to do than any other substance with the governing of the speed at which energy was produced in the body. Plummer showed the average basal metabolic rate of exophthalmic goitre patients at the time of coming under observation to be fifty-two per cent. above normal, and the average rate in those in whom ligations were done and who returned in three months, to be plus thirty-nine per cent. The average metabolic rate eighteen days after thyroidectomy was plus nineteen. Ligation

probably caused the metabolic rate to drop approximately twenty per cent. Other factors being constant, the total energy output of the body varied with the amount of thyroxine in the tissues and the rate of excitation.

In persons under twenty-five years of age, small adenomas in the thyroid, and the simple colloid goitres were only occasionally recommended for surgery. Later in life, the degenerations which occurred in goitres of long standing such as encapsulated adenomas and encapsulated colloid areas when the secretion has become reduced, might develop thyrotoxic conditions.

SECTION IN ORTHOPEDIC SURGERY.

Recent Studies in the Anatomy and Physiology of Tendons: Operations.—Dr. LEO MEYER said his interest in tendons was first awakened in the year 1912, when, while acting as volunteer in the clinic of Professor Lange, the problem of preventing postoperative adhesions was assigned as an experimental study to Doctor Henze, of New Haven, and to himself. The problem was one of great importance in Lange's eyes, since, despite his experience in two thousand operations, the results were frequently impaired by adhesions developing subsequent to the transplantation.

It was, of course, self-evident that the function of the tendon as a means of transmitting the contraction of the muscle to the skeleton was completely inhibited by a single strong adhesion, in the same way as the rope of the derrick could not glide if clamped at a single point. In the course of experimental investigations which were conducted chiefly on rabbits, they had utilized all manner of membrane, thin tubes of rolled silver, vaseline, bismuth paste, fascia, peritoneum, and a vein as means of ensheathing the tendon. None of these substances, however, prevented the development of adhesions; in fact, with the exception of the Cargile membrane, more adhesions were present after their introduction than in control experiments where nothing was used. Finally they followed the suggestion of Biesalski and utilized the sheath of the paralyzed tendon as a physiological pathway for the transplanted; that is, one tendon was withdrawn from its sheath, cut away from the paralyzed muscle, and the substituting tendon drawn downward by means of a guide suture, so as to occupy exactly the position of the original tendon. In all the cases there was complete absence of adhesions, even when the limb was immobilized thirty days subsequent to the operation. This clear cut evidence in favor of Biesalski's method indicated the importance of coordinating the operative technic with the physiology of the structures involved. Just exactly as the normal relationship between tendon and sheath should be maintained, so too the normal fascial relationship, the normal tension, and the normal fixation of the transplanted tendon should be made as nearly normal as possible. When, however, he had tried to follow out this line of thought, he found that their knowledge of the physiology and anatomy of tendons was most inadequate. No one had as yet considered the nature of the gliding mechanism of tendons. In no book, physiological or surgical, had the subject of tendon ten-

sion ever been brought up for discussion. Despite the thousands of tendon operations, some of the simplest facts relative to their anatomy had never been investigated.

It was therefore necessary before any comprehensive operative technic could be formulated, that these fundamental questions be investigated. The work was conducted by research on the cadaver, animal experimentation, and observations on human beings. The results showed the tendons to be equipped with a peculiar gliding apparatus, the essential element of which was the paratenon, a fatty tissue very rich in elastic fibres. This enabled the tendon to glide freely to and fro beneath the rigid fascia, and by means of its prolongation downward into the sheath, a valve was formed which permitted free motion without rupture of the delicate sheath wall.

The method of determining the tension of tendons consisted in the division of the tendon shortly above its insertion. The tendon ends separated for a distance of from one to two centimeters because of the tension to which they were subjected by the muscular pull; by means of a recording instrument, the approximal tendon stump was pulled downward until brought into apposition with the distal. The degree of force represented the tension to which the tendon was subjected. The figures varied markedly, according to the varying conditions of the experiment, but one fact remained constant, irrespective of the size of the animal, of the strength of the muscle: when under anesthesia, the limb was held in such a position that the origin of the muscle and its point of insertion were brought as near together as possible, then the tendon tension equalled 0; in other words, with the tibialis anticus divided, and the foot held in the position of calcaneovarus, then under anesthesia the two tendon ends came into exact approximation without the use of any force whatever. This simple physiological fact was readily applicable to tendon transplantation. The normal tension was restored by holding the limb in such a position as to approximate the origin of the muscle and the new site of tendon implantation. He could best illustrate the application of the physiological principle by outlining a typical tendon transplantation; for instance, the transfer of the extensor proprius hallucis for the paralyzed tibialis anticus: The first incision exposed the insertion of the paralyzed tendon. The tendon itself was slit longitudinally and the subjacent bone was traumatized. Against this traumatized surface the transplanted tendon was to be brought, since the resulting osteogenetic activity of the periosteal cells anchored the transferred tendon firmly in place. The second incision ran along the extensor proprius hallucis. The entire tendon was not exposed at first, but only the upper portion. The idea was that the tendon should be protected against drying until everything was ready for its transfer. When the sheath of the extensor proprius hallucis was opened, it could be seen that it was separated from the sheath of the tibialis anticus by the fascial septum. By prolonging the incision a short distance upward, a point was reached where this septum stopped short and the two tendon sheaths were sep-

arated only by paratenon. At this point a small opening was made directly into the sheath of the tibialis anticus; a probe containing a guide suture was passed downward through the sheath and emerged just over the insertion of the paralyzed tendon. By means of this guide suture the extensor proprius hallucis tendon, which was rapidly freed, was drawn downward through the sheath of the tibialis anticus and anchored firmly in the bed already prepared for it. In fastening it, the foot was held in the position of calcaneovarus, and the tendon was pulled upon with just enough force to render its course a straight one. Immobilization should not be continued more than three weeks, because by that time firm union had occurred. The patient was then allowed to walk with the transplanted tendon protected from undue tension by an appropriate splint. The therapeutic results achieved by this method, in the 250 cases operated in the last three and a half years, had been unusually gratifying.

SECTION IN LARYNGOLOGY, OTOTOLOGY, AND RHINOLOGY.

Results of High Explosives on the Ear.—Dr. J. GORDON WILSON, of Chicago, said that the otological cases resulting from the bursting of a shell divide themselves into two groups: 1, Those in which a piece of the shell has struck the ear; 2, those in which the damage has come from the explosion without any fragment of the shell striking the ear or its immediate neighborhood. It is with this second division that this paper is concerned. It includes a large number of cases in which the diagnosis is frequently very difficult and the treatment as yet unsettled and obscure.

In previous wars serious damage to hearing from concussion was extremely rare. In the present conflict, which is preeminently a war of trenches and high explosives, cases of concussion deafness are numbered by the thousands. The concussion effects on the ear are no longer confined to the artillery men who fire the big guns; far more numerous are the disastrous results produced by bursting shells on all classes of combatants. There are no figures available which can help us to form even an approximate estimate of the numbers injured in hearing either temporarily or permanently by shell explosions. In the early days of the war the large number of cases of deafness after shell explosions, the intensity of deafness, and sometimes the long persistence of this symptom, gave serious ground for fearing a serious lesion comparable to that of labyrinthine hemorrhage. This is disproved by the subsequent history of cases and by the available postmortem examinations. There have been published alarming percentages on the subject based on conclusions from an insufficient number of cases. A large proportion of the men suffering from shell concussion deafness get better very rapidly, in one ear usually more rapidly than the other. Those with simple rupture of the tympanum without suppuration are the first to recover; it is estimated that about fifty per cent. of these have serviceable hearing with a month. Cases of concussion deafness without perforation are more obstinate; of these

only twenty-four per cent have serviceable hearing within a month; total and seemingly incurable curable deafness is rare yet a very considerable number of those who have been exposed to a heavy bombardment which caused severe or complete deafness for one or more days will be found on examination to have diminution of hearing. Shell shock deafness means that the patient has been made deaf by the concussion of the shell, associated it may be by little obvious injuries due to its bursting. It must be noted that though not observable to the casual observer a trauma to the ear is frequently present and observable to the otologist. In many the probability of internal injury to the nervous system must be considered. The pathology of nerve deafness from high explosives is still little known. Complete pathological examination have been few. The postmortem examinations of petrous temporal bones obtained in France by Doctor Wilson, showed severe damage to the organ of hearing in the internal ear, very little damage to the equilibrium mechanism in the ear, and injury to the nerves of the ear. The examination substantiates the hypothesis that deafness from the effects of high explosives may result in distinct damage to the peripheral organ of hearing with little damage to the middle ear or the drum membrane.

The cases seen in a base hospital some time after injury can be divided into three groups: 1. Those with nerve deafness; 2, those who have had nerve deafness of a varying degree, and who with a varying amount of indefinite nerve symptoms have still the fixed idea that they cannot hear; 3, malingerers. The majority in this group undoubtedly have had shell concussion which affected the hearing and at the time of examination many still showed traces of traumatic neurosis. But the defective hearing has now been recovered from partially or entirely and they are now consciously exaggerating the defect still remaining or consciously claiming its persistence.

The cases now to be considered belong to group one. All have been exposed to and had their hearing damaged by the shell explosion. It was noted that here we have a type of deafness which is not usually noted in civil practice. The progress of these cases especially within the first few days is toward recovery. At the end of two or three months, although the number of the totally deaf is relatively not great, yet there are a very considerable number of men with marked impairment of hearing and who show no tendency to improvement. If now left alone they are not likely to improve. The future for these men is not satisfactory; they are deprived in no small measure of the pleasures of social life and hampered in their industrial outlook. The question then arises can anything be done for them to improve the remnant of hearing still present or must we fall back on such advantages as lip reading offers?

Doctor Wilson outlines the treatment which he found beneficial in these cases. He observed that in an ear totally deaf to voice and tuning forks it is possible to get perception of forks through bone conduction by summation of stimuli. Based on this he developed a method of treatment which resulted in a large number of cases in satisfactory results.

For an account of this treatment and the results the original paper will have to be consulted. In concluding he said prognosis is good as a rule. While a psychogenic factor cannot be denied in concussion deafness the frequency of labyrinthine symptoms immediately following the shell burst speaks against an exclusive view of the psychogenic or functional explanation of the nerve deafness.

SECTION IN OPHTHALMOLOGY.

The Relation of Hereditary Eye Defects to Genetics and Eugenics.—Dr. LUCIEN HOWE, of Boston, has been assigned the task of preparing the bibliography to date; to arrange it according to diagnosis; add new family histories to such eye defects; chart certain histories reported previously only in narrative form; compare the relation of such defects with the Mendelian or other principles of heredity; show the importance of a differential diagnosis between defects really hereditary and those due to infection; and to suggest a plan for the prevention of hereditary blindness by sequestration, or by sterilization if the transmitter of the blindness so elects. The bibliography contained a list of over seven hundred articles on the subject, or about two hundred more than had been given in earlier bibliographies, all arranged according to diagnoses. Twenty-four new family histories, taken from the family histories of eye defects at the Eugenics Record Office, Cold Spring Harbor, and over two hundred new charts of family histories, which had been given previously only in narrative form, were also presented. The relation of eye defects to the Mendelian law was shown by the breeding of eye defects in fowls. Some of the family histories of eye defects reported as due to heredity were evidently results of infection. It was suggested that a committee be appointed to report upon the question whether the section should advise legislation for the prevention of blindness by the sequestration or even the sterilization of persons whose offspring showed that such persons possessed this extreme eye defect as a dominant factor. Later, in executive session, such a committee was appointed.

Letters to the Editors.

TREATMENT OF VENEREAL DISEASE.

which reads as follows:

Book Reviews.

[We publish full lists of books received, but we acknowledge no obligation to review them all. Nevertheless, so far as space permits, we review those in which we think our readers are likely to be interested.]

Minor Maladies and Their Treatment. By LEONARD WILLIAMS, M. D., Physician to the French Hospital. Fourth Edition. New York: William Wood & Co., 1918. Pp. xi-402. (Price, \$2.75.)

"Sir James Mackenzie is fond of insisting," says Doctor Williams in his preface, "that our present methods of investigation are not sufficiently directed toward the discovery of disease in its earlier stages; that we are content impotently to contemplate the full blown, whereas we ought to search for buds and tendencies. I believe the serious study of what are called minor maladies will . . . lead to the prevention . . . of many serious diseases." The author holds the same belief that the general practitioner stands in need of greater facility in treating those minor conditions which he meets in vastly greater proportion than the more "interesting" and disabling conditions in which he is often more learned. His volume is thoroughly profitable reading, delightfully written and practically sound, a book meriting not only reading, but perusal. Much that is classical is tempered with the latest conclusions in science, and the most modern theories are expounded fairly with practical common sense, though, at times, with caustic comment. He emphasizes in an excellent chapter the rôle of the minor glandular insufficiencies, and points out the great advantages held out in their study. His perspective and his emphasis of the importance of subacute conditions is particularly well balanced. Certainly it is a book containing much useful material, and should be well received.

A Manual of Histology. By HENRY ERDMANN RADASCH, M. Sc., M. D., Assistant professor of Histology and Embryology in the Jefferson Medical College and instructor in Anatomy in the Pennsylvania Academy of Fine Arts, Philadelphia, Pa. Philadelphia: P. Blakiston's Son & Co., 1918. Pp. x-580. (Price \$2.50.)

This manual probably adds but little to the facts of histology. Its chief virtues lie in orderly arrangement, completeness, and the profusion of excellent illustrations and legends. Built up from a compend, it retains the conciseness of that form of presentation, and is sufficiently expanded to serve the purposes of a complete text. The long introductory chapter on technic is of value. The author is to be especially complimented on the cuts, as they show evidence of great care in selection and preparation. We could wish that the a, b, and c of figure 162 were not upside down, but we know 'em that way. On the whole, this excellent manual presents an intelligent, workmanlike, and a complete exposition of the minute construction of the body.

Scopolamine Morphine Seminarcosis During Labor. By WILLIAM OSBORNE GREENWOOD, M. D., B. S. London: Henry Frowde, (Oxford University Press), and Hoder & Stoughton, 1918. Pp. ix-120.

The agony of childbirth is metaphorically established ever since Biblical times, so firmly that even many obstetricians have never thought of obviating it or noiselessly opening the gates of life, and women have accepted that which seemed inevitable, the ancient fear never lessening during the centuries and becoming more accentuated during twentieth century nervousness. The fact that a rough peasant girl or a savage will often be delivered one day and go to work the next is hardly believed, or, if believed, it is urged that civilization marks a different set of conditions. So there are four personages to argue at the bedside. The savage, the old theologian who considers pain as part of the never ending penalty for disobedience, the old fashioned family doctor who has not time to study, and the younger men, such as the author of the book before us, who admit the pain but would conquer it by placing the tender hand of the coming child in that of mist eyed sleep. Doctor Greenwood has much modesty,

but great experience, and sees rightly that adversaries serve for the advancement of a cause if they do not degenerate into unthinking antagonists. He carefully reviews "twilight sleep" from the time when it was tried in 1902 by Korff and Schneiderlein, and gives convincing arguments in its favor, though admitting, even enumerating, its dangers in certain cases. It certainly will convince many obstetricians of the virtues of the birth sleep and, through their convincing, generations of expectant mothers may be enabled to sing an undiluted *Magnificat*.

Nine Humorous Tales. By ANTON CHEKHOV. Translated by Isaac Goldberg and Henry T. Schnitkind. Boston: The Stratford Company, 1918. Pp. 60. Price, 25 cents.

For many years France led the way in short story writing, though many of them resembled delicate water color sketches having an unanalytical charm. The English writer had to make something happening all the time and did not leave much to the imagination. Then came the American authors, who have equalled the French but in a different way. Their short stories are like powerful studies in black and white, no necessary detail is omitted, no superfluous lines put in to obscure the striking pictures—especially those of country life—in which they excel.

Quite different, but embodying the merits of all the three, are the Russian stories so rapidly becoming known, and the little volume of Anton Chekhov which has just come in for review because the author was himself once a doctor, has only one defect—it should have been longer, but the publishers are right in issuing these 25 cent editions. They are just delectable mouthfuls which make us want more, and so we are gently enticed to travel in unknown Russia, and to learn, even in short stories, truths concerning the heroic, passionate, childlike Russian. One charm, though sometimes a somewhat disconcerting one, is that you never know how the stories will end; sometimes they never seem to "end" at all, but are like the wonderful stories told by very little children which break off abruptly, and, if question be put about what happened afterward, they cheerfully say, "There isn't any end; the people just stopped doing things."

Births, Marriages, and Deaths.

Died.

CALDWELL.—In New York, on Thursday, June 20th, Dr. Eugene Wilson Caldwell, Major, Medical Reserve Corps, U. S. Army, aged forty-seven years.

CARPENTER.—In Pittsford, N. Y., on Tuesday, June 4th, Dr. Paul D. Carpenter, aged fifty-two years.

McAVOY.—In Brooklyn, N. Y., on Friday, June 21st, Dr. William T. McAvoy, aged thirty-seven years.

MOTT.—In New York, on Wednesday, June 19th, Dr. Valentine Mott, aged sixty-five years.

POLK.—In Atlantic City, N. J., on Sunday, June 23d, Dr. William Mecklenburg Polk, of New York, aged seventy-three years.

RADDA.—In New York, on Wednesday, June 5th, Dr. Jaroslav Radda, aged forty-five years.

RAINES.—In Fort Riley, Kansas, on Friday, May 24th, Dr. Thomas Hart Raines, Lieutenant, Medical Reserve Corps, U. S. Army, of Savannah, Ga., aged thirty-nine years.

SCRIBNER.—In Worcester, Mass., on Friday, June 14th, Dr. Ernest V. Scribner, aged sixty-three years.

STELLWAGEN.—In Philadelphia, on Friday, June 7th, Dr. Thomas C. Stellwagen, aged seventy-seven years.

TOBIN.—In Pittsfield, Mass., Thursday, June 6th, Dr. James Henry Tobin, aged fifty years.

URQUEHART.—In Ashfield, Mass., on Friday, June 14th, Dr. John Edwin Urquhart, aged fifty-eight years.

WATSON.—In Sacramento, Cal., on Sunday, May 26th, Dr. William Seth Watson, formerly of Fishkill-on-Hudson, New York, aged sixty-seven years.

WILLIAMS.—In Cambridge, Mass., on Sunday, June 9th, Dr. Charles Herbert Williams, aged sixty-eight years.

WORLEY.—In Baltimore, Md., on Thursday, May 30th, Dr. Gaines Worley, of St. Augustine, Fla., aged forty-two years.

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